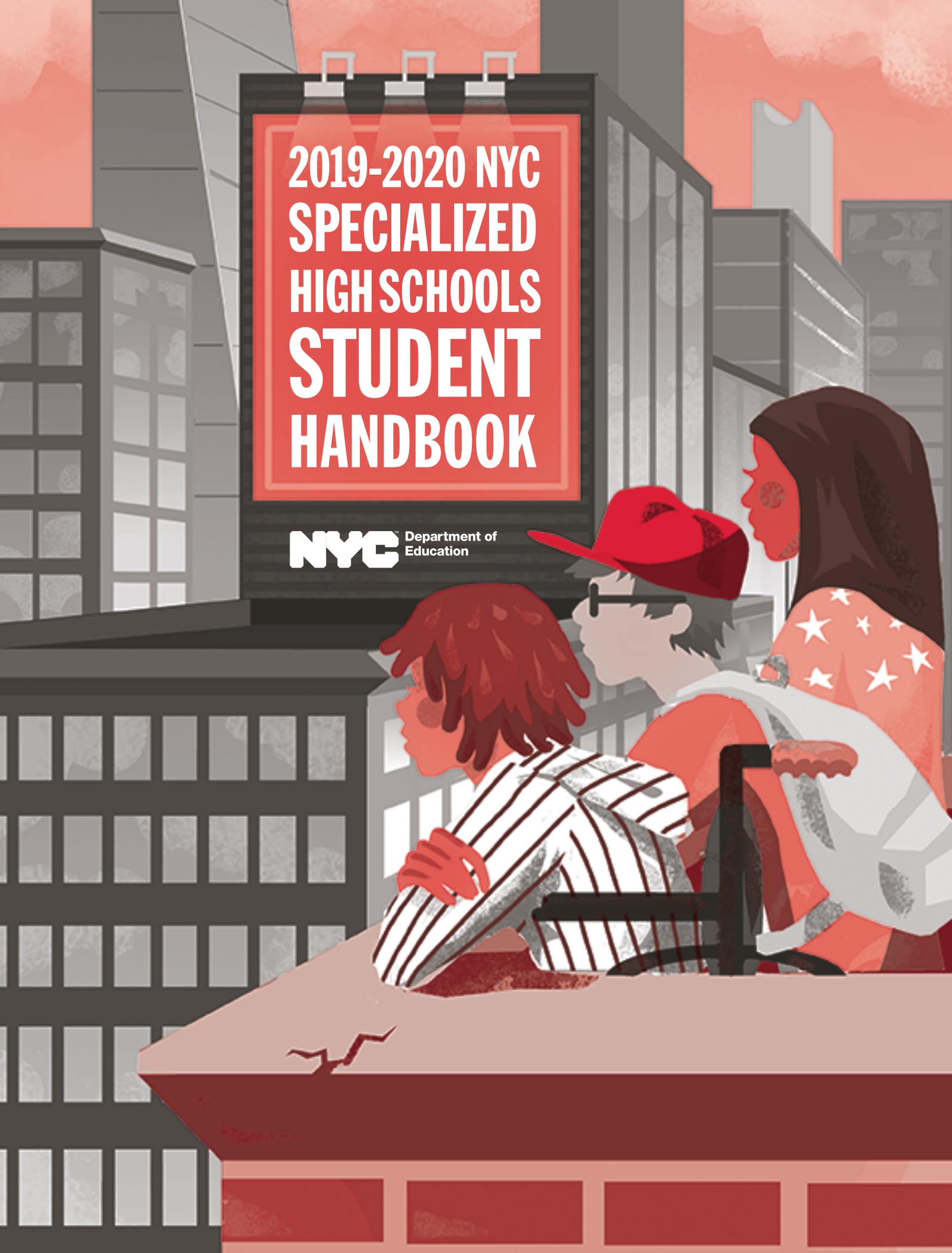


# 2019-2020 NYC SPECIALIZED HIGH SCHOOLS STUDENT HANDBOOK

**NYC** Department of  
Education



<b>English</b>	Translations of this directory are available at middle schools, Family Welcome Centers, and online.
<b>Arabic</b>	تتوفر نسخ مترجمة من هذا الكتاب في المدارس المتوسطة، ومراكز استقبال العائلات، وعلى شبكة الإنترنت.
<b>Bengali/Bangla</b>	এই বইটির অনুবাদ মিডল স্কুলগুলোতে, ফ্যামিলি ওয়েলকাম সেন্টারগুলোতে, এবং অনলাইনে পাওয়া যাবে।
<b>Chinese</b>	可在各初中、家庭歡迎中心和網上索取本指南的中文譯本。
<b>French</b>	Les traductions de ce livre sont disponibles dans les collèges, les Centres d'accueil pour les familles et en ligne.
<b>Haitian Creole</b>	Tradiksyon liv sa a disponib nan lekòl presegondè yo, nan sant byenveni pou fanmi yo, ak sou entènèt.
<b>Korean</b>	이 책의 번역본은 각 중학교, 패밀리 웰컴 센터 및 온라인에서 구할 수 있습니다.
<b>Spanish</b>	Las versiones traducidas de esta guía están disponibles en las escuelas intermedias, en los Centros de Bienvenida a las Familias y en internet.
<b>Russian</b>	За переводом руководства обращайтесь в средние школы и Семейные центры или посетите наш веб-сайт
<b>Urdu</b>	اس کتاب کا ترجمہ مڈل اسکولوں، خاندانی استقبالیہ مراکز اور آن لائن دستیاب ہے۔

**[schools.nyc.gov/SHS](https://schools.nyc.gov/SHS)**



**ABOUT THE COVER**

**Student:** Nova Stanley | **Teacher:** Carl Landegger | **Principal:** Manuel Ureña

Each year, the NYC Department of Education and Cooper Hewitt, Smithsonian Design Museum, partner on a cover design competition for public high school students. This directory's cover was designed by Nova Stanley, a student at the High School of Art and Design. Nova's design expresses the new independence and relationships that students build as they transition into high school. These students look out into the city, imagining their next four years of growth and discovery. They are all supporting each other while recognizing their differences and the different paths they will take. For more information, including how to enter next year's competition, ask your art teacher or visit [schools.nyc.gov/CoverDesign](https://schools.nyc.gov/CoverDesign).

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# MESSAGE TO STUDENTS AND PARENTS/GUARDIANS

## ABOUT SPECIALIZED HIGH SCHOOLS ADMISSIONS

This 2019–2020 Specialized High Schools Student Handbook contains useful information, including:

- Specialized High School admission procedures
- Registration for the Specialized High Schools Admissions Test (SHSAT) and Fiorello H. LaGuardia High School of Music & Art and Performing Arts (LaGuardia High School) auditions
- Confirming testing accommodations on the SHSAT and for LaGuardia High School auditions
- Calendar of important dates
- SHSAT testing day procedures and policies
- Sample SHSAT tests with test-taking tips

**There are nine Specialized High Schools in New York City. They are:**

<b>ADMISSIONS DETERMINED BY AUDITION(S)</b>	<b>FIGURE H. LAGUARDIA HIGH SCHOOL OF MUSIC &amp; ART AND PERFORMING ARTS</b>	
	Dance	Drama
	Instrumental Music	Technical Theater
	Fine Arts	Vocal Music
<b>ADMISSIONS DETERMINED BY SHSAT</b>	<b>THE BRONX HIGH SCHOOL OF SCIENCE</b>	
	<b>THE BROOKLYN LATIN SCHOOL</b>	
	<b>BROOKLYN TECHNICAL HIGH SCHOOL</b>	
	<b>HIGH SCHOOL FOR MATHEMATICS, SCIENCE AND ENGINEERING AT THE CITY COLLEGE OF NEW YORK</b>	
	<b>HIGH SCHOOL OF AMERICAN STUDIES AT LEHMAN COLLEGE</b>	
	<b>QUEENS HIGH SCHOOL FOR THE SCIENCES AT YORK COLLEGE</b>	
	<b>STATEN ISLAND TECHNICAL HIGH SCHOOL</b>	
	<b>STUYVESANT HIGH SCHOOL</b>	

These schools were established under New York State Law 2590 – Section G. Entrance into these schools is determined by the SHSAT, except for LaGuardia High School, which is based on a competitive audition and review of academic records. Students must be residents of New York City and current eighth grade or first-time ninth grade students in order to apply, register, sit for, and receive results for the Specialized High Schools Admissions Test (SHSAT) and LaGuardia High School audition(s).

For updates concerning Specialized High School admissions, please visit: [schools.nyc.gov/shs](http://schools.nyc.gov/shs).

The Specialized High Schools Student Handbook is a project of the New York City Department of Education.

### **The Bronx High School of Science**

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75 Bronx Science Boulevard, Bronx, New York 10468

Phone: (718) 817-7700

Website: [www.bxscience.edu](http://www.bxscience.edu)

Email: [golanc@bxscience.edu](mailto:golanc@bxscience.edu)

#### **2019 Admissions**

19,307 students listed Bronx Science as a choice on the SHSAT, and 803 offers were made.

### **The Brooklyn Latin School**

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223 Graham Avenue, Brooklyn, New York 11206

Phone: (718) 366-0154

Website: [www.brooklynlatin.org](http://www.brooklynlatin.org)

Email: [parents@brooklynlatin.org](mailto:parents@brooklynlatin.org)

#### **2019 Admissions**

17,244 students listed The Brooklyn Latin School as a choice on the SHSAT, and 540 offers were made.

### **Brooklyn Technical High School**

---

29 Fort Greene Place, Brooklyn, New York 11217

Phone: (718) 804-6400

Website: [www.bths.edu](http://www.bths.edu)

Email: [info@bths.edu](mailto:info@bths.edu)

#### **2019 Admissions**

23,637 students listed Brooklyn Tech as a choice on the SHSAT, and 1,825 offers were made.

### **High School for Mathematics, Science and Engineering at the City College of New York**

---

240 Convent Avenue, New York, New York 10031

Phone: (212) 281-6490

Website: [www.hsmse.org](http://www.hsmse.org)

Email: [info@hsmse.org](mailto:info@hsmse.org)

#### **2019 Admissions**

19,537 students listed HSMSE at CCNY as a choice on the SHSAT, and 165 offers were made.

### **High School of American Studies at Lehman College**

---

2925 Goulden Avenue, Bronx, New York 10468

Phone: (718) 329-2144

Website: [www.hsas-lehman.org](http://www.hsas-lehman.org)

Email: [atrebofiore@schools.nyc.gov](mailto:atrebofiore@schools.nyc.gov)

#### **2019 Admissions**

16,769 students listed HSAS at Lehman College as a choice on the SHSAT, and 124 offers were made.

## **Queens High School for the Sciences at York College**

---

94-50 159th Street, Jamaica, New York 11433

Phone: (718) 657-3181

Website: [www.qhss.org](http://www.qhss.org)

Email: [BWittstruck@schools.nyc.gov](mailto:BWittstruck@schools.nyc.gov)

### **2019 Admissions**

16,836 students listed Queens High School of the Sciences at York College as a choice on the SHSAT, and 142 offers were made.

## **Staten Island Technical High School**

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485 Clawson Street, Staten Island, New York 10306

Phone: (718) 667-3222

Website: [www.siths.org](http://www.siths.org)

Email: [BMalenfant@schools.nyc.gov](mailto:BMalenfant@schools.nyc.gov)

### **2019 Admissions**

15,827 students listed Staten Island Technical High School as a choice on the SHSAT, and 304 offers were made.

## **Stuyvesant High School**

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345 Chambers Street, New York, New York 10282-1099

Phone: (212) 312-4800

Website: [www.stuy.edu](http://www.stuy.edu)

Email: [02M475@schools.nyc.gov](mailto:02M475@schools.nyc.gov)

### **2019 Admissions**

22,338 students listed Stuyvesant High School as a choice on the SHSAT, and 895 offers were made.

## **Fiorello H. LaGuardia High School of Music & Art and Performing Arts**

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100 Amsterdam Avenue, New York, New York 10023

Phone: (212) 496-0700

Website: [www.laguardiahs.org](http://www.laguardiahs.org)

Email: [admissions@laguardiahs.org](mailto:admissions@laguardiahs.org)

### **2019 Admissions**

1,483 students received one or more offers to the programs at LaGuardia High School from a pool of 4,263 students who auditioned.

## When and Where Do I Take the Specialized High School Admissions Test (SHSAT)?

### 2.1 Who Can Take the SHSAT?

All Grade 8 and first-time Grade 9 students who are New York City residents and who wish to attend a Specialized High School, with the exception of LaGuardia High School, must take the SHSAT. SHSAT testing is open to public district and charter school students, private and parochial school students, students with disabilities, students with limited mobility, and English Language Learners (ELLs). Approximately 29,000 students took the SHSAT for September 2019 admission and approximately 5,000 students received an offer.

If you are interested in taking the SHSAT, speak with your school counselor during the registration period.

You will be issued a Test Ticket, which will indicate your test date, time, location, and testing accommodations (if applicable).

You must test on the date and at the location assigned. Please see page 5 for a description of testing locations. You will be assigned to a test site based on where you go to school. Please report conflicts to your school counselor as soon as possible. See below for information on make-up requests.

### 2.2 When Is the SHSAT Administered?

#### Early September – Early October 2019

Registration Period

#### Mid-October 2019

Test Tickets available for distribution

<b>TEST DATES</b> (For locations, see page 5)	
<ul style="list-style-type: none"> <li>■ All current Grade 8 students</li> </ul>	<b>Saturday, October 26, 2019*</b>
<ul style="list-style-type: none"> <li>■ All current Grade 8 students</li> <li>■ All first-time Grade 9 students</li> </ul>	<b>Sunday, October 27, 2019</b>
<ul style="list-style-type: none"> <li>■ Current Grade 8 and first-time Grade 9 students who are English Language Learners or students with disabilities who have Individualized Education Programs (IEPs) or 504 Plans that include testing accommodations.<sup>†</sup></li> <li>■ Make-up test</li> </ul>	<b>Saturday, November 2, 2019</b> <b>Sunday, November 17, 2019</b>
<ul style="list-style-type: none"> <li>■ Students new to New York City (Records must show that student arrived in NYC after the November test.)</li> </ul>	<b>End of summer 2020</b>

\*Students from 55 schools around the city will take the SHSAT during the school day on Wednesday, October 30th, as part of a pilot program.

<sup>†</sup>More information about eligible English Language Learners and former English Language Learners is on page 13.

## 2.3 What If the Administration Dates Do Not Work for Me?

- Notify your school counselors within the registration period if you cannot test on either a Saturday or a Sunday because of a religious observance. If your test ticket has a date that you cannot test on due to a religious observance, talk to your counselor, who can change the date.
- If your test date is the same day as your LaGuardia High School audition, you will be able to reschedule your audition. Read the directions on page 8 in the section "What Can I Do if I Cannot Make the Audition Dates?"
- If you are ill and unable to take the test on a scheduled date, you must immediately notify your school counselor when you return to school, and request a make-up testing date. You must provide documentation explaining that you were sick and unable to test.
- You must provide documentation to your school counselor before the deadline to request a make-up test. Details for requesting a make-up test will be communicated to school staff after October 27, 2019.

## 2.4 Where Do I Go to Take the SHSAT?

<b>TEST LOCATIONS</b>		
<b>Grade 8 and 9 students attending schools in:</b>	<b>TESTING SITE</b>	<b>ADDRESS</b>
Manhattan	Stuyvesant High School	<b>345 Chambers Street, New York, NY 10282</b> Tel: (212) 312-4800 <b>Subways:</b> 1, 2, 3, A, C, E to Chambers Street; R to City Hall <b>Buses:</b> M20, M22, M5, M9, X1, X10
Bronx	The Bronx High School of Science	<b>75 West 205 Street, Bronx, NY 10468</b> Tel: (718) 817-7700 <b>Subways:</b> 4, to Bedford Park Boulevard-Lehman College; B, D to Bedford Park Boulevard <b>Buses:</b> Bx1, Bx10, Bx2, Bx22, Bx26, Bx28, Bx3
Brooklyn Districts 13, 14, 15, 16, 19, 32	Brooklyn Technical High School	<b>29 Fort Greene Place, Brooklyn, NY 11217</b> Tel: (718) 804-6400 <b>Subways:</b> 2, 3, 4, 5 to Nevins Street, A to Hoyt & Schermerhorn; B, Q, R to DeKalb Avenue; C to Lafayette Avenue; D, N to Atlantic Avenue-Barclays Center; G to Fulton Street <b>Buses:</b> B103, B25, B37, B38, B41, B45, B52, B54, B62, B63, B65, B69
Brooklyn Districts 17, 18, 21, 22, 23	James Madison High School	<b>3787 Bedford Avenue, Brooklyn, NY 11229</b> Tel: (718) 758-7200 <b>Subways:</b> B, Q to Kings Highway <b>Buses:</b> B100, B2, B31, B44, B49, B7, B82, BM3, BM4
Brooklyn District 20	Sunset Park High School	<b>153 35th Street, Brooklyn, NY 11232</b> Tel: (718) 840-1900 <b>Subways:</b> D, N, R to 36th St – 4 Ave <b>Buses:</b> B35, B37, B63, B70, X12, X14, X17, X17A, X19, X3, X42, X5, X9
Queens Districts 24, 25, 30	Long Island City High School	<b>14-30 Broadway, Long Island City, NY 11106</b> Tel: (718) 545-7095 <b>Subways:</b> N, Q to Broadway <b>Buses:</b> Q100, Q102, Q103, Q104, Q18, Q66, Q69
Queens Districts 26, 27, 28, 29	Hillcrest High School	<b>160-05 Highland Avenue, Jamaica, NY 11432</b> Tel: (718) 658-5407 <b>Subways:</b> E, J, Z to Jamaica Center-Parsons/Archer; F to Parsons Boulevard <b>Buses:</b> Q1, Q110, Q111, Q112, Q114, Q17, Q2, Q20A, Q20B, Q24, Q3, Q31, Q34, Q36, Q40, Q41, Q43, Q56, Q6, Q65, Q76, Q77, Q8, Q83, Q9, X68
Staten Island	Staten Island Technical High School	<b>485 Clawson Street, Staten Island, NY 10306</b> Tel: (718) 667-3222 <b>Subways:</b> Staten Island Railway (SIR) to New Dorp <b>Buses:</b> S57, S74, S76, S78, S79-SBS

**Note:** Not every site will be available on November 17. Please check your Test Ticket for precise testing location.

## 2.5 How Are the Test Results Used?

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**Please note that the SHSAT is not considered for admission to LaGuardia High School.** For all other Specialized High Schools, offers are made to students based on their SHSAT scores, how they ranked the Specialized High Schools on the SHSAT answer sheet, and seat availability. SHSAT scores are available in March 2020 with High School Admissions Round One results. Refer to section 7.2 "SHSAT Scoring and Test Results" for more information on how offers are made after scoring.

From year to year, the number of offers and available seats for each Specialized High School may be subject to an increase or decrease based on school enrollment.

# 3.0

## What If I Want to Go to Fiorello H. LaGuardia High School of Music & Art and Performing Arts?

### 3.1 What Are the 2019–2020 Audition Dates?

#### Early September – Early October 2019

Register for LaGuardia High School audition(s) with your school counselor.

#### Mid-October 2019

Audition Tickets available for distribution

AUDITION DATES				
All auditions are held at LaGuardia High School. Dates are scheduled according to the borough in which your school is located, not your current home address, and by the first letter of your last name.				
BOROUGH	LAST NAME	AUDITION GROUP	DATE	START TIME
Bronx	A–Z	<ul style="list-style-type: none"> <li>Students auditioning for multiple studios</li> <li>Students auditioning for Technical Theater</li> </ul>	Saturday, November 2, 2019	8:00 AM
Bronx	A–L	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 3, 2019	8:00 AM
Bronx	M–Z	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 3, 2019	11:30 AM
Brooklyn	A–Z	<ul style="list-style-type: none"> <li>Students auditioning for multiple studios</li> <li>Students auditioning for Technical Theater</li> </ul>	Saturday, October 26, 2019	8:00 AM
Brooklyn	A–L	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, October 27, 2019	8:00 AM
Brooklyn	M–Z	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, October 27, 2019	11:30 AM
Manhattan	A–Z	<ul style="list-style-type: none"> <li>Students auditioning for multiple studios</li> <li>Students auditioning for Technical Theater</li> </ul>	Saturday, November 2, 2019	8:00 AM
Manhattan	A–L	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 3, 2019	8:00 AM
Manhattan	M–Z	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 3, 2019	11:30 AM
Queens/ Staten Island	A–Z	<ul style="list-style-type: none"> <li>Students auditioning for multiple studios</li> <li>Students auditioning for Technical Theater</li> </ul>	Saturday, November 16, 2019	8:00 AM
Queens/ Staten Island	A–K	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 17, 2019	8:00 AM
Queens/ Staten Island	L–Z	<ul style="list-style-type: none"> <li>Students auditioning for a single studio (except Technical Theater)</li> </ul>	Sunday, November 17, 2019	11:30 AM
All	A–Z	Make-up auditions	Saturday, November 30, 2019	8:00 AM
All	A–Z	Make-up auditions	Sunday, December 1, 2019	8:00 AM

### **3.2 What Is the Admissions Process for LaGuardia High School?**

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- Admission to LaGuardia High School is based on a competitive audition and review of a student's academic record to ensure success in the school's demanding studio work and challenging academic program.
- To audition for one or more of the studios at LaGuardia High School, a parent/guardian must register for the audition(s) online in MySchools (myschools.nyc) or inform their school counselor of their intention to audition and indicate for which studio(s) they wish to audition. Parents/guardians of students who are registered for auditions will receive an Audition Ticket through the online system or from their school counselor in mid-October. The Audition Ticket will show the audition date, time, and location.
- Students are evaluated based on their preparation for the audition, technical proficiency, and artistic expression. Most students receiving an offer for one or more of the studios typically score between 80–100 points on the studio rubric in addition to having a satisfactory academic and attendance record.
- All applicants must bring their Audition Ticket to each audition for entrance on their scheduled date. Students must have their academic record from the previous school year entered into MySchools to be considered for offers to LaGuardia High School. For public school students who attended a public school the previous year, the academic record will be automatically entered into MySchools. For students who attend a charter school or a non-public school (private or parochial), students must work with their current school or a Family Welcome Center to enter their academic record from the previous year into MySchools. Students will not be re-evaluated based on any subsequent improved academic performance.

### **3.3 How Can I Audition If I Recently Moved to New York City?**

---

If your official records indicate that you became a New York City resident after November 1, 2019, you may be eligible to audition at the end of summer 2020. Please visit a New York City Department of Education Family Welcome Center once you become a New York City resident.

### **3.4 What Can I Do If I Cannot Make the Audition Dates?**

---

If your audition date conflicts with a religious observance, you may audition on either the Saturday or Sunday of the same weekend you were originally scheduled.

If your scheduled SHSAT date or time conflicts with your scheduled LaGuardia High School audition, you must audition on either the Saturday or Sunday of your scheduled weekend.

If you need to reschedule your audition due to illness or injury, you must provide documentation to your school counselor.

### **3.5 Accommodations During LaGuardia Auditions**

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- English Language Learners (ELLs), students with Individualized Education Plans (IEPs) that include testing accommodations, and students with approved 504 Plans that include testing accommodations are eligible to receive testing accommodations during their auditions for LaGuardia High School as long as the accommodations do not interfere with the content or the skill being measured. Some accommodations are not needed for auditions.
- Approved accommodations for LaGuardia High School auditions will appear on students' Audition Tickets. Parents/guardians and students must review their Audition Tickets to make sure accommodations are listed there correctly. If the accommodations are missing from the ticket or are

incorrect, parents/guardians must talk to their child's school counselor before the registration deadline. LaGuardia High School cannot change a student's approved testing accommodations.

- Do not send any documents related to auditions to LaGuardia High School. These will not be reviewed.

### 3.6 Audition Day Expectations

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- Students must arrive on time for their audition(s). The arrival time on the audition ticket will not be the actual start time of the audition. Students are strongly encouraged to bring a light snack and/or water.
- Students registered to audition for multiple studios may be asked by LaGuardia High School to audition over more than one day. Students should ask their school counselors to follow up with LaGuardia High School directly if they are in this situation.
- At the auditions, there is a designated waiting area for families, as audition areas are for student applicants only. Family members or guardians also may choose to leave and re-enter the school building at any time. It is important that the student has food and that any other communication with families is made prior to the beginning of the audition process.
- Prior to the audition, you will be asked to read and sign a statement indicating that you are a resident of New York City and are well enough to audition. Students who sign this statement but do not meet the requirements specified will be disqualified from acceptance to LaGuardia High School.
- Prior to the start of the audition, audition site staff will take a photograph or video of the students in each audition room. These images will be used for audition security purposes only.

### 3.7 What Is the Audition Process Like for Each Studio?

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A total of 4,263 students auditioned for one or more of the six studios at LaGuardia High School for the 2019–2020 school year. Students may audition for the studios listed below. Only students who are residents of New York City are eligible to apply and audition.

**DANCE** You will participate in both a ballet class and a modern dance class. You should wear ballet shoes and fitted black dance attire.

**DRAMA** You should be prepared to perform two (age- and content-appropriate) contrasting one-minute monologues. You may be asked to do an impromptu reading. Attire for the audition should allow you to perform any movement necessary for your monologues or an impromptu reading.

**FINE ART** You must bring a portfolio of 8–15 pieces of original artwork done in a variety of media. The type of artwork should be from observation, imagination, and memory. All artwork must be labeled appropriately to include student name, type of artwork, and medium. You must also label artwork as being created from observation, imagination, or memory. Photographs—not originals—of three-dimensional (3D) works may be included. For the audition, you will be given three drawing assignments. Students are asked to draw the human figure from observation, draw a still life from memory, and create a drawing in color based on imagination. All drawing materials for auditions will be supplied by the school at the time of the audition.

**INSTRUMENTAL MUSIC** You should prepare a solo selection to perform without accompaniment and bring one copy of the music you plan to perform. You should bring your instruments to the audition, except if you are auditioning on piano, percussion, tuba, double bass, or harp. These instruments will be provided by the school at the audition. Amplifiers also will be provided at the audition if you are an electric guitarist. You will be tested for rhythm and tonal memory and will be asked to perform a sight-reading excerpt. You will also be evaluated based on rhythm, tone quality, and technique.

**TECHNICAL THEATER** You are expected to bring a prepared 3D design model/diorama with attached photograph of the diorama from one of the following plays: *The Crucible*, *A Raisin in the Sun*, or *Dracula*. You must be able to discuss the play and your choices in designing the diorama. You must also be able to carry the diorama yourself throughout the audition day. You will participate in a one-on-one, hands-on practical in more than one aspect of technical theater.

**VOCAL MUSIC** You should prepare a song to sing without accompaniment for the audition. LaGuardia High School has a suggested online song list ([www.laguardiahs.org](http://www.laguardiahs.org)); you are not required to select from the song list. The song must showcase the applicant's rhythm, tone, interpretation, and pitch. In addition to performing the selected song, you will be asked to sing back melodic patterns and tap back rhythmic patterns.

### 4.1 What Are the Steps in the Application Process?

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#### 1 Contact Your School Counselor

Tell your school counselor that you would like to take the SHSAT and/or audition for LaGuardia High School by the registration deadline.

#### 2 Obtain a Test or Audition Ticket

Your school counselors will give you a SHSAT Test Ticket and/or a LaGuardia High School Audition Ticket by mid-October. This ticket will indicate

- the location of the test/audition site
- the date and time of the test/audition
- the student's ID number
- the school code of the student's current school
- testing accommodations (if applicable)

Review this information and report problems to your school counselor right away. SHSAT sites are based on the location of your current school, not where you live. LaGuardia High School audition dates and times are based on the borough where you currently attend school.

#### 3 Review Test or Audition Ticket

If you are an ELL or a Student with a Disability, you will test on Saturday, November 2, 2019, or Sunday, November 17, 2019. Make sure your testing accommodations are written correctly. Tell your counselor immediately if something is wrong. If you are an ELL or a student with a disability, check your ticket and make sure you are scheduled for the correct testing date (see page 4) and that your accommodations are listed correctly. Inform your school counselor immediately if there are any mistakes on the Test or Audition Ticket.

#### 4 Complete and Obtain Parent/Guardian Signature on Test or Audition Ticket

You and your parents/guardians must sign the Test or Audition Ticket prior to the exam or audition. If you are taking the SHSAT, you must rank up to eight Specialized High Schools in priority order on the test ticket. You will copy these choices onto the SHSAT answer sheet on test day. You should work with your family so that you are prepared to do this correctly. Each student will be considered for admission only for the schools ranked on their answer sheet. You may choose to rank only one school on your answer sheet, or you may list all eight schools. You will have a better chance of receiving an offer if you rank more schools on your answer sheet. This will be the only opportunity for you to indicate your choices. The LaGuardia High School Audition Ticket will show the studio(s) for which the student is registered to audition. You should make a copy of the Audition Ticket for each audition.

#### 5 Attend SHSAT or Audition

If you are taking the SHSAT, you must bring your Test Ticket to the test site on the day of the test. If you are auditioning for any studio at LaGuardia High School, you must bring your Audition Ticket to your audition.

If you arrive without an Audition or Test Ticket, you may not be allowed to test or audition. Although sites will make every effort to confirm a student's registration and allow those with missing tickets to test or audition, you may need to be scheduled for another date. Students should arrive at the time indicated on the Test or Audition Ticket, but it is important to note that the test or audition will start after the arrival time listed on the Test or Audition Ticket.

## **6 Receive Results**

You must be a resident of New York City in order to receive results of the SHSAT and/or offers to LaGuardia High School studio(s). In March 2020, you will be notified through the High School Admissions Round One results letters whether or not you received offer(s) to Specialized High Schools. If you audition for one or more of the studios at LaGuardia High School, you may receive offer(s) to one or more of the studios. If you receive an offer to a Specialized High School, you may, at the same time, receive an offer to one of the other high school choices that you submitted on your New York City High School Admissions Round One Application. Students with more than one offer will choose one to accept.

### **4.2 Accommodations for the SHSAT and LaGuardia High School Auditions**

The following students are eligible to receive testing and/or audition accommodations on the SHSAT and on LaGuardia High School auditions:

- students with disabilities who have IEPs or 504 Plans that include testing accommodations,
- current ELLs, and
- former ELLs who achieved proficiency on the New York State English as a Second Language Achievement Test (NYSESLAT) in 2018 and 2019.

The purpose of testing accommodations is to allow students with disabilities and limited English proficiency to participate in assessments on an equal basis with their peers. Testing accommodations provide the opportunity for eligible students to demonstrate mastery of skills and knowledge without being limited or unfairly restricted due to the effects of a disability or language proficiency.

Review the New York City Department of Education's (NYCDOE) resources on testing accommodations for additional information: <https://www.schools.nyc.gov/special-education/supports-and-services/other-special-education-services/testing-accommodations>.

#### **Important Information About Accommodations:**

- Testing accommodations for the SHSAT or LaGuardia High School auditions are provided based on a student's existing testing accommodations. These are documented on students' IEPs or 504 Plans or based on their ELL status.
- Accommodations that are requested only for the SHSAT and/or LaGuardia High School auditions are not allowed. Students must demonstrate a documented history of needing and using testing accommodations.
- Students with 504 Plans must have their accommodations approved every year. Schools and families must review (and approve, if appropriate) the student's 2019–2020 504 Plan no later than the last day of school in June 2019. Please see this FAQ on 504 Plans: <https://www.schools.nyc.gov/school-life/health-and-wellness/504-accommodations>.
- Students who demonstrate disabilities or temporary impairments within 30 days of the SHSAT may request certain emergency testing accommodations, if approved by the principal of the student's current school. Please see the section "What If I Need Emergency Testing and/or Audition Accommodations?" on page 15 for more information.

## Students with IEPs and 504 Plans

Students with disabilities will be provided with the accommodations listed in their IEPs or 504 Plans unless the accommodation is not permitted or is not needed on the SHSAT (see the section "Testing Accommodations Not Allowed for the SHSAT"). Contact your school counselor with questions about testing accommodations on the SHSAT and to make sure your testing accommodations are correct on your Test Tickets.

## ELLs and Eligible Former ELLs

- ELLs and eligible former ELLs taking the SHSAT are granted extended testing time totaling 360 minutes (2.0x standard testing time) as well as up to two 15 minute breaks after the first 180 minutes of testing.
- The extended time is calculated from start time of the SHSAT, **not** the arrival to the testing site.
- Bilingual Math glossaries will also be provided by the NYCDOE on the day of the SHSAT at each test administration site in the NYCDOE's nine major languages: Arabic, Bengali, Chinese (Traditional and Simplified), French, Haitian-Creole, Korean, Russian, Spanish, and Urdu.
- Students are not permitted to bring their own bilingual Math glossaries. Sample glossaries can be found on the Specialized High Schools Admissions Test (SHSAT) website: <https://www.schools.nyc.gov/school-life/learning/testing/specialized-high-school-admissions-test>.

ELLs with IEPs or 504 Plans will receive the accommodations to which they are entitled, as long as the accommodations are permitted for the SHSAT (see section "Testing Accommodations Not Allowed for the SHSAT").

If your IEP or 504 Plan includes the use of assistive technology, such as a Frequency Modulation (FM) Unit or other aids, such as masks, markers, highlighters, pencil grip, slant board, or a magnifying glass, you must bring these with you on the day of the SHSAT and/or audition if needed. The test or audition sites will not provide these aids.

## Scribes and Answers Recorded in the Test Booklet

If you have a scribe listed on your IEP or 504 Plan, it is important to discuss with your school counselor what you need on the SHSAT. If you need help answering in the test booklet, you will require a scribe. A scribe is needed only if a student is unable to circle their answers in the test booklet. Students who require a scribe on testing day will have a one-to-one testing administration. Students who are able to circle answers in the test booklet are provided with the "Answers Recorded in the Test Booklet" accommodation. The proctor will assist the student with transcribing the answers from the test booklet onto the answer sheet at the conclusion of the test. It is critical for families to work with their IEP or 504 Team to make sure the correct accommodation is listed on the IEP or 504 Plan as well as on the student's Test Ticket.

## Testing Accommodations Not Allowed for the SHSAT

Students are entitled to the testing accommodations stated on their IEPs or 504 Plans; however, certain accommodations are not permitted for any student on the SHSAT. For example, students are not permitted to use calculators and/or Math tables on the Math section because this section of the SHSAT measures students' mathematical computation skills.

Additionally, oral translations of test directions, questions, and answers are not permitted because this changes the standardization of the test. (ELLs who need translations are permitted to use bilingual Math glossaries on the Math section of the SHSAT only.)

Students and families must work with their school counselors to inquire about testing accommodations or specific situations which may not be addressed here.

## Testing Accommodations Not Needed for the SHSAT

There are some accommodations that students may use on other tests that may not be needed on the SHSAT. For example, students who use a computer or word processor for tests with essays will not need to use this accommodation on the SHSAT because there are no essays on the test.

## Confirming Testing Accommodations

- During the SHSAT registration period, a student's current school, including non-public schools (private and parochial schools), is responsible for entering and/or confirming the appropriate testing accommodations in the NYCDOE's enrollment and registration system. For students with 504 Plans or similar school-based accommodation plans (only for students not in NYCDOE schools), all documentation must be submitted to the NYCDOE for review at least three (3) weeks prior to the registration deadline. Documentation received after this deadline may not be reviewed in time for the student's scheduled test date. Students and families should contact their school counselors at their current schools with questions about testing accommodations on the SHSAT.
- Non-public school students requesting accommodations during their LaGuardia auditions must work with their school counselor. Accommodations must be reviewed and approved before Audition Tickets are available. Approved accommodations for LaGuardia High School auditions must appear on students' Audition Tickets. Neither parents/guardians nor school staff should send accommodations directly to LaGuardia High School.
- Non-public school students with disabilities who do not have an IEP or 504 Plan indicating their need for testing accommodations **must work with their school counselors to complete a NYCDOE Request for Accommodations form** and submit the form and supporting documentation to the NYCDOE for review and approval by September 30, 2019. Parents/guardians can get the form from their child's current school. The child's school counselor is responsible for submitting the form by September 30, 2019. The NYCDOE may need additional information about how a student's accommodations were determined and will verify the documented history and need for requested accommodations.

## How Do I Opt Out of Testing Accommodations?

Before the registration deadline, parents/guardians of ELLs and students with IEPs or 504 Plans may opt out of testing accommodations for their children on the SHSAT or LaGuardia High School auditions. Parents/guardians must contact their child's school counselor to indicate in writing their desire to opt out of testing accommodations for their child before the registration deadline. Neither school counselors nor students may opt out of testing accommodations; written consent by a parent/guardian is required.

If it is not possible to provide written consent to opt out of testing accommodations before the registration deadline, parents/guardians must provide their written consent on testing day to opt out of the testing accommodations listed on their child's Test or Audition Ticket.

On testing day, students cannot modify or opt out of the testing accommodations listed on their Test or Audition Ticket unless parent/guardian consent has been provided in writing on the Test or Audition Ticket.

## How Is the SHSAT Administered to Students with Extended Time?

- All students must stay in testing rooms for the entire standard test administration time (180 minutes), with the exception of using the bathroom.
- Once the standard test administration time (180 minutes) is over, students with an accommodation of extended time may leave if they have finished working on the exam.
- Students will have a break at the conclusion of the 180 minutes, and then again after another 90 minutes have passed.

- Students who leave before the end of their extended time will be required to acknowledge in writing that they had the opportunity to use the full amount of the extended time period but chose to leave early.
- If a parent/guardian does not want their child to leave the testing room before the full amount of the extended time period has ended, the parent/guardian is responsible for communicating this to their child before the test begins.
- Re-tests will not be provided to students who choose to leave before the end of their extended time.

### **What If I Need Emergency Testing and/or Audition Accommodations?**

Emergency testing accommodations are intended for use by students whose disabilities or injuries occur after the registration deadline but before their scheduled testing/audition day and without enough time to develop an IEP or 504 Plan. For the SHSAT, students and families should work with their school counselor to complete the Emergency Testing Request form and ask their school counselor to email the NYCDOE as soon as possible prior to the testing day that emergency accommodations may be needed.

If a family requests an accommodation without giving the NYCDOE sufficient time to review the request before the regular SHSAT administration date, the student's SHSAT may be rescheduled to ensure that the request for accommodations may be properly reviewed.

If a student requires emergency accommodations for a LaGuardia High School audition, the family or school counselor must contact LaGuardia High School directly to request the accommodation.

**Students and families should contact their current school counselor for additional information about testing accommodations.**

### **4.3 Is the Building Where I Am Testing or Auditioning Accessible?**

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The NYCDOE is committed to ensuring that its programs, services, and activities are accessible to staff, members of the school community, students, and family members with disabilities. The NYCDOE assesses all of its buildings on a continuing basis to determine which schools are accessible to individuals with disabilities. For the most up-to-date information on the accessibility of each school, please contact the school directly. Families are encouraged to visit schools to learn about the level of accessibility. For more information, please visit <http://schools.nyc.gov/Offices/OSP/Accessibility>.

## 5.0 What Is on the SHSAT?

### 5.1 SHSAT Test Design for 2019

The SHSAT has two sections: English Language Arts (ELA) and Math. Standard administration time is 180 minutes to complete the test.

There are 57 questions total in each section; of these, 47 are scored questions and 10 are embedded field test questions.

**You will NOT know which questions are scored and which are field test questions. It is to your advantage to answer all questions in each section.**

### 5.2 English Language Arts Section (57 Questions)

The English Language Arts (ELA) section consists of two parts—Revising/Editing and Reading Comprehension—as described below.

Revising/Editing	
<b>Number of Questions</b>	9–11
<b>Skills Assessed</b>	ability to recognize and correct language errors and improve overall quality of writing
<b>Format</b>	<u>Part A</u> : each question is based on its own sentence/paragraph <u>Part B</u> : all questions are based on a single, multi-paragraph text

Reading Comprehension	
<b>Number of Questions</b>	46–48
<b>Skills Assessed</b>	ability to understand, analyze, and interpret texts from a variety of genres
<b>Format</b>	6 texts, including informational and literary, followed by 6–10 questions

Informational texts for ELA may include any of the text types that middle school students should have experience with, such as: exposition, argument, and functional text in the form of personal essays, speeches, opinion pieces, essays about art or literature, biographies, memoirs, journalism, and historical, scientific, technical, or economic accounts written for a broad audience.

Literary texts for ELA may include any of the text types that middle school students should have experience with, such as: poetry, adventure stories, historical fiction, mysteries, myths, science fiction, realistic fiction, allegories, parodies, or satire.

### **5.3 Math Section (57 Questions)**

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The Math section consists of word and computational questions in either a multiple-choice or grid-in format. There are five grid-in Math questions and 52 multiple-choice questions. Math questions on the Grade 8 test forms are based on material included in the New York City curriculum through Grade 7. Math questions on the Grade 9 test forms are based on material through Grade 8.

## 6.1 Test Materials

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### Students **MUST** bring to the testing session:

- ✓ a SHSAT Test Ticket signed by parent/guardian with student's Specialized High School choices
- ✓ sharpened Number 2 pencils (you cannot use a pen)
- ✓ an eraser
- ✓ Assistive Technology (if indicated on the IEP and Test Ticket)

### Students **CAN**, but are not required to bring:

- ✓ slant board
- ✓ pencil grip
- ✓ FM unit
- ✓ highlighter
- ✓ a non-calculator, silent watch
- ✓ a quiet, unwrapped snack and water (Students can have their snack before the beginning of the test administration; snacks are not allowed during testing time.)

### Students **MUST NOT** have any of the following items during the test:

- ✗ cameras
- ✗ calculators
- ✗ calculator watches or smart watch
- ✗ MP3 Player/iPod
- ✗ tablet/iPad, ebook reader
- ✗ cell phone, any other electronic device
- ✗ outside written materials
- ✗ soda, juice, or any other drinks beyond water; water is the only beverage allowed in the testing site

### The test site will provide:

- ✓ a test booklet
- ✓ answer sheet
- ✓ scrap paper, which is attached to the booklet and can be used to take notes for Math calculations and will be collected at the end of the test
- ✓ **ELLs ONLY** will receive a Math bilingual glossary in one of the nine DOE languages

### Cell Phones and Electronic Devices:

Cell phones are allowed in the test sites but are not allowed to be turned on during testing time.

Students are not allowed to have cell phones on them during the test. The cell phone may not be in the student's pocket, hand, or desk. Test sites will designate a cell phone collection procedure for students

to follow before the test starts. Students will be instructed to turn off and store cell phones/cameras/ electronic devices according to the regulations set by the test site.

## 6.2 Arriving at the Test Site

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Arrive at the test site at the time that is on your SHSAT Test Ticket. The test site will provide information about estimated times when students will be released from testing.

- **Please note, the time shown on the Test Ticket is the arrival time, not the time the test will start.** The test will begin as soon as possible after arrival at each test site.
- Prior to the start of the test, NYCDOE staff will take a photograph or video of the students in each testing room. These images will be used for test security purposes only.

## 6.3 Filling In the Answer Sheet

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Before taking the test, you will fill out important information on Side 1 of your answer sheet. First, you will be asked to read and sign a statement on your answer sheet stating that you are well enough to take the test, a resident of New York City, and are taking the test for the correct grade level.

- Be sure you are taking the test for the correct grade level.
- If you do not feel well, you should inform the test proctor immediately; you should not begin the test or sign the statement. Once you break the security seal and begin the test, you may not be able to request a make-up test due to illness.
- Other parts of the answer sheet will ask you to provide information such as name, student ID number, school number, and school choices on the answer sheet. It is important to fill in the circles completely so that scoring is not delayed.
- In Grid 4 you will fill in your name as it appears on your Test Ticket. Do not use your nickname. For example, if your name on your school record is Robert, you should fill in that name, even if most people call you "Robbie." Or if your name on your school record is Mei-Ling, you should fill in that name, even if most people call you "Melanie."
- Grid 5 is for your Specialized High Schools choices. Admission is based on your test score, the order of your school choices, and the number of offers available at each school. It is very important that you make your decisions about ranking schools before the day of the test. Discuss with your family the schools you are interested in (pages 2–3 list all the Specialized High Schools), and determine the order in which you will list them on the answer sheet. Bubble in these choices on the Test Ticket so that you will be able to carefully copy them onto Grid 5 on your answer sheet at the test site. Only choices made in Grid 5 will be considered.

You must fill in one and only one circle for each school for which you wish to be considered. You may make as few as one or as many as eight choices. To increase your chances of receiving an offer to one of the Specialized High Schools, you are encouraged to make more than one choice, and you are required to fill in at least a first choice school.

## EXAMPLES OF CORRECT GRID 5

This student accurately ranked all eight schools.

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**  
Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

School choices indicated on the answer sheet are final.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Latin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Brooklyn Tech	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS Math, Sci., & Engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS American Studies/Lehman	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queens Sci./York	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staten Island Tech	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stuyvesant	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**  
Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

School choices indicated on the answer sheet are final.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Latin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Tech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS Math, Sci., & Engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS American Studies/Lehman	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queens Sci./York	<input checked="" type="radio"/>	<input type="radio"/>						
Staten Island Tech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stuyvesant	<input checked="" type="radio"/>	<input type="radio"/>						

This student accurately ranked just two schools.

**You MUST fill in a first choice school.**

## EXAMPLES OF INCORRECT GRID 5

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**  
Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

School choices indicated on the answer sheet are final.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Latin	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Tech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS Math, Sci., & Engineering	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS American Studies/Lehman	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queens Sci./York	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staten Island Tech	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>				
Stuyvesant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**DO NOT fill in more than one circle in a column.**

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**  
Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

School choices indicated on the answer sheet are final.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Latin	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brooklyn Tech	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS Math, Sci., & Engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HS American Studies/Lehman	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queens Sci./York	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staten Island Tech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stuyvesant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**DO NOT fill in more than one circle in a row.**

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**  
Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

School choices indicated on the answer sheet are final.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input type="radio"/>							
Brooklyn Latin	<input type="radio"/>							
Brooklyn Tech	<input type="radio"/>							
HS Math, Sci., & Engineering	<input type="radio"/>							
HS American Studies/Lehman	<input type="radio"/>							
Queens Sci./York	<input type="radio"/>							
Staten Island Tech	<input checked="" type="radio"/>							
Stuyvesant	<input type="radio"/>							

**DO NOT fill in the same school for each choice.**

When you are told to begin the test, mark your answers on the answer sheet by completely filling in the appropriate circle. Make sure your marks are heavy and dark. Be careful not to make any stray marks on the answer sheet. If you change an answer, completely erase your first answer. There is only one correct answer to each question. If your answer sheet shows more than one mark in response to a question, that question will be scored as incorrect.

SAMPLE ANSWER MARKS				
(A)	(B)	(C)	●	RIGHT
✓	(B)	(C)	(D)	WRONG
(A)	<del>(B)</del>	(C)	(D)	WRONG
(A)	(B)	◐	(D)	WRONG
(A)	(B)	●	●	WRONG

**You may write in your test booklet or on the scrap paper provided to work through ELA or Math questions, but your answers must be recorded on the answer sheet in order to be counted. It will not be possible to go back and mark your answers on the answer sheet after time is up. Information in the test booklet or on scrap paper will not be counted.**

## 6.4 Student Misconduct

It is important to note that test security is critical for the SHSAT. As such, the following rules are strictly enforced to ensure all students have a fair testing experience.

- Test questions and answers may not be shared with any individuals outside of the testing site.
- During the test, you may not attempt to communicate with other students in any way. This includes, but is not limited to:
  - speaking, writing and passing notes
  - sharing test booklets or answer sheets
  - looking at other students' answers
  - recording test questions
  - possession of a camera or electronic device (even if it is powered off)
- At the end of the test, you will be told to stop and put your pencil down and will be given directions about your testing materials. Once your test administrator tells you to put your pencil down, you may not continue writing on any of your testing materials, which includes, but is not limited to:
  - darkening bubbles
  - circling bubbles
  - erasing responses

Students found to be engaging in any of these activities will have their tests invalidated.

- Grade 8 students will not be allowed to take the test again until the following school year.
- Grade 9 students will not have any additional opportunities to take the test after Grade 9.

Any student who refuses to put away or turn in a prohibited device will not be allowed to take the test. Possession of prohibited items at any time during the test administration, even if powered off, will result in the test being invalidated. Students will not be provided with an opportunity to make up the exam on a subsequent day.

### 7.1 Claims of Testing Irregularities

The NYCDOE works hard to ensure that the SHSAT is administered in a fair and consistent manner to all students. If, however, you believe there is a disturbance or problem during any part of the SHSAT, you should bring the matter to the immediate attention of the proctor. This may include a misprinted test booklet, undue distraction, or improper student behavior. The proctor will attempt to remedy the situation and may take a written statement from you at the end of the test.

Students and parents/guardians may also report any suspected proctoring or testing irregularities in one of the following ways:

- 1) By submitting an electronic request to [HS\\_Enrollment@schools.nyc.gov](mailto:HS_Enrollment@schools.nyc.gov), or
- 2) By sending a written request via certified mail with proof of delivery to:

**Office of Student Enrollment  
52 Chambers Street, Room 415  
New York, NY 10007**

All requests must be submitted no later than **one week** after the test administration date.

For all claims, please include parent/guardian and student names, as well as telephone and/or email contact information. Any claims of testing irregularity postmarked later than one week after the test date may not be considered. Claims will be responded to on an individual basis.

### 7.2 SHSAT Scoring and Test Results

There are three types of scores that result from the SHSAT scoring process. The ELA and Math sections of the SHSAT are treated separately in the scoring process until the end when the ELA and Math scores are added together for the final score, called the composite score.

- **Raw Score:** SHSAT scores are based on the number of correct answers marked on scored questions<sup>1</sup>, which is called a raw score.
  - When the number correct is counted, every question counts the same—one raw score point.
  - It doesn't matter which particular questions you get right or wrong within each section (ELA and Math). You should not spend too much time on any one question because a question that you find 'harder' won't get you more raw score points than one that you find 'easier.'
  - There is no penalty for wrong answers.
- **Scaled Score:** Because there are several forms of the SHSAT, raw scores from different test forms cannot be compared directly. The test forms are developed to be as similar as possible, but they are not identical. To make valid score comparisons, a raw score must be converted into another type of score that takes into account the differences between test forms. The conversion from raw score to scaled score is done separately for each section (ELA and Math). Two conversions are used to convert the ELA and Math raw scores into scaled scores. Those conversions are:
  - **Calibration:** Calibration takes into account any small differences between different test forms.
  - **Normalization:** Normalization adjusts scores to fit a normal (Gaussian) distribution.

<sup>1</sup> A small number of questions will be pre-designated for field testing and will not count toward a student's score.

Both calibration and normalization are non-linear. As a result, the raw scores and scaled scores are not proportional. That means that an increase in one raw score point does not always lead to the same increase in scaled score points. For example, in the middle of the range of scores, an increase of one raw score point may correspond to an increase of three or four scaled score points. At the top or bottom of the range of scores, an increase of one raw score point may correspond to 10–20 scaled score points. The closer you are to getting every question in a section right (or every question wrong), the more your scaled score goes up (or down) for that section. Consequently, you should use any extra time for your stronger section.

- **Composite Score:** The composite score is the sum of the ELA and Math scaled scores. The composite score is used to determine admission to a Specialized High School.

### Most Important Things to Know about How Your Test Is Scored

- It does not matter which particular questions you get right or wrong within each section.
- A question that you find harder will not get you more raw score points than one that you find easier.



Do not spend too much time on any single question.

- There is no penalty for wrong answers.
- Your "best guess" is better than not answering at all.



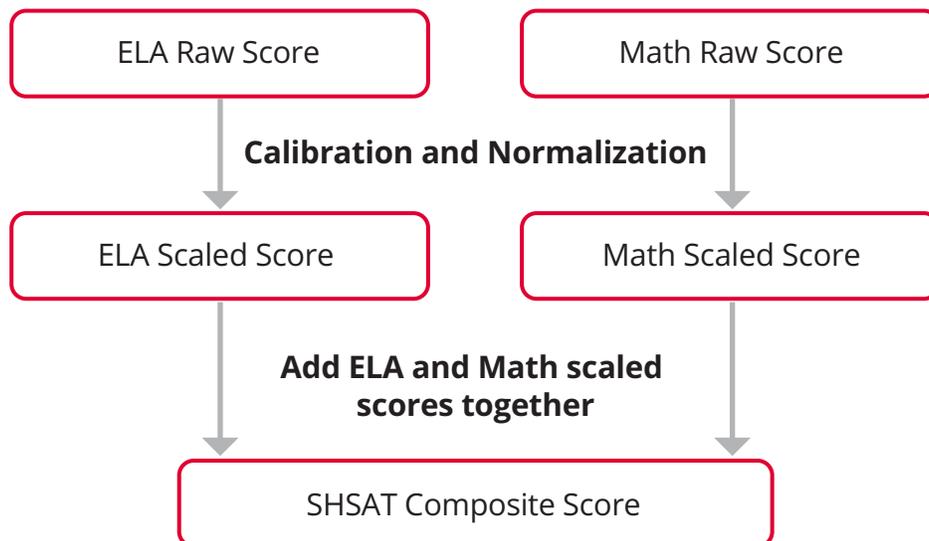
Fill in an answer for every question.

- The more questions you get right in each section (ELA and Math), the more your scaled score goes up for that section.
- It is likely that you will get more answers right in the section you generally perform better in at school.



If you have extra time remaining during test time, you should focus on the section you are strongest in.

The scoring process (calibration and normalization) for the SHSAT is redone every year specifically for that year's test. This ensures that a student's score is calculated and compared only with the other students who took the SHSAT in the same year. Because of this, SHSAT scores cannot be directly compared between years and there is no set minimum or maximum score. The maximum score on each section is usually around 350 and the maximum composite score is usually around 700; however, the actual maximum and minimum scores change from year to year.



To determine offers to a Specialized High School:

- All students take the SHSAT and list their school choices on the SHSAT answer sheet in their true preference order. Students only list the eight Specialized High Schools where admissions is based on the SHSAT. **See pages 19–20 for more information about listing choices.**
- All scores of the students who took the test are ordered from highest score to lowest score.
- The student with the highest composite score is placed in their first choice (highest listed school).
- Starting from the highest score on down, each student, in turn, is placed in that student’s highest listed school in which seats are still available. Therefore, if all the seats in a student’s first-choice school have been offered to students who scored higher, the student is placed in their second-choice school if seats are available. If all the seats in the student’s second-choice school have been offered to students who scored higher, the student is offered a seat in their third-choice school if there are still seats available, and so on. This process continues until there are no seats available in any of these eight Specialized High Schools.

### 7.3 Test View Procedures

After receiving results, students and their parents/guardians have the opportunity to review a copy of the student's answer sheet by requesting an appointment with a representative from the Office of Assessment. Copies of the answer sheets are not available for distribution but will be reviewed at the scheduled appointment. Appointments may be arranged in one of the following ways:

- 1) By submitting an electronic request via the SHSAT website, <https://www.schools.nyc.gov/school-life/learning/testing/specialized-high-school-admissions-test>, or
- 2) By sending a written request to:

**Office of Assessment**  
**44-36 Vernon Blvd., Room 209**  
**Long Island City, New York 11101**

Electronic requests must be submitted and letters must be postmarked no later than March 31, 2020. Requests must include:

- student's name, date of birth, and OSIS number
- parent/guardian's name, phone number, and email address

After submitting your request, the Office of Assessment will provide information to schedule an appointment. The student and at least one parent/guardian must be present at the appointment. Translators are available upon request.

## Initiatives to Increase Diversity at Specialized High Schools

The New York City Department of Education is working on a series of initiatives aimed at increasing testing rates among high-potential students in underrepresented communities, increasing the acceptance and offer rates among these students, and increasing retention of these students.

- **Discovery Program**—The Discovery Program is a summer enrichment program for disadvantaged rising ninth-grade students who take the Specialized High Schools Admissions Test (SHSAT) and score within a certain range below the qualifying score for that year. All eight testing Specialized High Schools sponsor a Discovery Program. Students who successfully complete the program requirements receive the opportunity to attend a Specialized High School.

Students will be notified whether they are eligible to participate in Discovery in Spring 2020. Students will only be considered for Discovery programs at the Specialized High School(s) they list on their SHSAT answer sheet.

To be eligible, the student must:

1. have scored within a certain range below the qualifying score on the SHSAT. Eligible scores will vary from year to year and will be based on seat availability;
2. be certified as disadvantaged; and
3. be recommended by their current school as having high potential for the Specialized High School program.

Once notified of eligibility, families should meet with the school counselor to discuss the Discovery Program application. Not all eligible students will be accepted into the Discovery Program. Those students who are successful in meeting the demands of the summer program will be granted an offer to the school sponsoring the Discovery Program. Those students who are not successful will attend the school to which they had previously received an offer. Students should speak to their school counselors if they have any questions. For more information on eligibility requirements, please visit <http://schools.nyc.gov/SHS>.

- **SHSAT School Day Administration Pilot**—In fall 2019, Grade 8 students at 55 middle schools will have the opportunity to take the SHSAT at their home school during the school day. The intent of a school day administration is to remove barriers to weekend test participation and to increase the number of underrepresented students who take the SHSAT. The SHSAT School Day pilot also provides test preparation and family engagement activities to participating schools and students. Students and families should speak to their school counselors to ask if their school is participating in the SHSAT School Day pilot.
- **DREAM-SHSI**—The DREAM Specialized High Schools Institute (DREAM-SHSI) is a NYC DOE test preparation program designed to help prepare eligible Grade 7 students to take the SHSAT in Grade 8. Eligibility for DREAM-SHSI requires that students meet academic criteria and federal income guidelines. The program runs from November of Grade 7 to the fall of Grade 8. Schools will inform students who are eligible to apply in fall of their Grade 7 year.
- **DREAM Intensive**—The DREAM Summer/Fall Intensive (Intensive) prepares eligible rising Grade 8 students for the SHSAT by exposing them to rigorous coursework and test-taking strategies. Eligibility for DREAM Intensive requires students to meet academic criteria and live or attend school in a district least represented at the Specialized High Schools. The program runs from the summer after a student's Grade 7 year through the fall of their Grade 8 year, up to the date of the

SHSAT. Schools will inform students eligible to apply in late winter / early spring of their Grade 7 year.

For more information on the diversity initiatives, please visit:

- [schools.nyc.gov/SHS](https://schools.nyc.gov/SHS)
- <https://www.schools.nyc.gov/about-us/programs/dream-program>

Parents/guardians are encouraged to review the following tips with their children so that they are well prepared for the test.

### 9.1 Know What to Expect

- Become very familiar with the design of the test by reviewing the following in this handbook:**
  - description of the test on pages 16–17
  - the two full-length sample tests
  - each sample test's answer key and explanations
  - extra samples for the Math grid-in questions
  - specific sample Grade 9 questions (if you plan to take the test as a 9th grader)
- Become familiar with the sample items.**
  - ELA sample items start on page 31.
  - Math sample items start on page 43.
- Become familiar with the directions for each section so that you:**
  - fully understand what you have to do for each part of the test: Revising/Editing Parts A & B, Reading Comprehension, Math Grid-Ins, and Math Multiple-Choice
  - can focus your time on answering the questions rather than reading the directions on test day
- Become familiar with the answer sheet so that you can:**
  - easily fill in your name, grade level, and birth date on test day before you start the test
  - easily and accurately rank your preferences for attending a specialized high school
  - easily, accurately, and quickly mark your answers once the testing session begins on test day
  - See pages 231–234 for Sample Answer Sheets.

### 9.2 Take the Practice Tests

- Make a plan.**
  - There are two Sample Tests in this Handbook, and you can use them in any way you want; you are encouraged to use at least one of the tests to practice taking a full test under timed conditions.
  - You have 180 minutes to complete the test; ELL students or students with approved accommodations have 360 minutes to complete the test.
  - You may begin the test in whatever section/part you want, so decide in advance what order you will take the test in.
  - You may divide time between the ELA and Math sections however you want.
- Tear or cut out the two detachable sample SHSAT answer sheets that are provided in the back of this handbook (pages 231–234).**
- Keep track of your 180 minutes of test time by using a watch or clock.**
- Start answering questions in either the ELA or Math section.**

- Remember, it is up to you to decide which section you take first!
- Work carefully, but keep moving at a comfortable pace.
- Do not spend more than a couple minutes on any one question.

**Bubble your answers on the answer sheet as you work through each question.**

**Answers must be completely filled in.**

- All answers must be recorded on the answer sheet BEFORE time is called. You won't be given extra time to transfer answers to the answer document.

SAMPLE ANSWER MARKS				
(A)	(B)	(C)	●	RIGHT
⊗	(B)	(C)	(D)	WRONG
(A)	⊗	(C)	(D)	WRONG
(A)	(B)	●	(D)	WRONG
(A)	(B)	●	●	WRONG

**An educated guess can be the right answer.**

- Do this by eliminating the answer choice(s) that are definitely wrong, and then choose one of the remaining answers.
- Your score is based on the number of correct answers marked on the answer sheet. Because there is no penalty for wrong answers, omitting a question will not give you an advantage.

**Check your work if you have time remaining.**

- If you finish before time is up, go back over your work to make sure that you followed instructions, did not skip any questions, and did not make careless mistakes.
- Note that on testing day, you must remain in the testing room for the entire duration of the test (180 minutes).

### 9.3 Check Your Answers from the Sample Test

**After you complete the sample test, check your answers against the list of correct answers.**

- Read the explanations of the correct answers to see the kinds of mistakes you may have made.
- Check to see whether there is a pattern to your errors.
  - ELA Example: did you miss many questions about central idea or author's purpose?
  - Math Example: did you miss many questions because of miscalculations?
- Seek out opportunities to do more practice in areas that challenged you.

## 9.4 How to Prepare for the English Language Arts Section

The English Language Arts section consists of 57 multiple-choice questions that assess revising/editing skills and reading comprehension. These questions are aligned to the **Common Core Learning Standards**. The pages that follow provide tips for answering the revising/editing and the reading comprehension questions.

### Overview of Revising/Editing Part A

The language skills assessed in this section are based on the Language section of the Common Core Learning Standards for Grade 7, as well as the Language Progressive Skills that are introduced at lower grade levels. Each question directs you to read a sentence, a list of sentences, or a paragraph with numbered sentences. Then you are asked to address issues related to conventions of language or punctuation. Examples include:

- selecting the best correction for an error
- identifying a sentence with an error
- improving the writing by combining sentences or revising part of a sentence



### Tips for Revising/Editing Part A

First, read the question.

- Read the question carefully so you know what type of issue to look for while reading the text.

Next, read the text in the box and take notes on the issues you observe, while being mindful of time.

- Are there words, phrases, or sentences that are difficult to read due to an error in language usage or punctuation?
- Is there any part of the text that could be written more clearly, concisely, or precisely?
- Quickly mark up the text when you notice an issue. This may help you to select an answer option.
- Keep in mind that your notes should focus on the specific topic of the question.



- Before test day, plan how much time you will spend on Part A; this will help you to be efficient when answering each question on test day.

## Sample Questions for Revising/Editing Part A

### Sample 1: Select the best correction/s for an error (or errors).

Read this paragraph.

(1) With its luscious trees and grassy fields stretching like a green ribbon across Manhattan, New York City's Central Park is a natural oasis amid the bustling city. (2) While more than 25 million people visited the park each year, they are also a temporary home to an abundance of migratory birds. (3) During the spring and fall migrations, the park becomes a bird watcher's paradise, prompting scores of avid birders with binoculars in hand to flock to it. (4) More than 270 species of birds, including swallows, thrushes, and at least 25 different species of warblers, have been observed making the park their home in the big city.

How should the paragraph be revised?

- E. Sentence 1: Change *its* to **their**, AND change *is* to **was**.
- F. Sentence 2: Change *visited* to **visit**, AND change *they are* to **it is**.
- G. Sentence 3: Change *becomes* to **became**, AND change *it* to **them**.
- H. Sentence 4: Change *have been* to **had been**, AND change *their* to **its**.



To determine the best revisions for this paragraph, read the possible changes listed in the first option as you read Sentence 1 in the paragraph. If a revision does not need to be made, continue reading each sentence and answer option until you find the correct answer.

## Sample 2: Identify a sentence with an error.

Read this paragraph.

(1) Established in 1946, the National Air and Space Museum (NASM) contains the most prominent collection of historical aircraft in the world. (2) As one of the many museums and landmarks of the Smithsonian Institution, millions of people from around the world visit NASM each year. (3) Over the years, NASM has undergone several renovations and major reconstruction to accommodate more visitors and exhibits. (4) In addition to being a popular Washington, DC, tourist destination, NASM is home to a research center for terrestrial and planetary science.

Which sentence should be revised to correct an error in sentence structure?

- A. sentence 1
- B. sentence 2
- C. sentence 3
- D. sentence 4



To identify the sentence, read carefully while being mindful of time; don't just skim. The error could be anywhere in the paragraph.



Note that the error is specific to *sentence structure*, which means it relates to how the words and phrases are put together to convey (represent) an idea or ideas.

### Sample 3: Improve the writing by combining sentences or revising part of a sentence.

Read these sentences.

- (1) Monarch butterflies travel thousands of miles from southern Canada and the United States to Mexico.
- (2) Monarch butterflies migrate every year in the fall, seeking warmer climates.

What is the best way to **combine the sentences** to clarify the relationship between the ideas?

- A. While monarch butterflies travel to seek warmer climates every fall, they migrate thousands of miles from southern Canada and the United States to Mexico.
- B. Monarch butterflies migrate thousands of miles from southern Canada and the United States to Mexico, but they are seeking warmer climates.
- C. Monarch butterflies, although they seek warmer climates every year in the fall, migrate thousands of miles from southern Canada and the United States to Mexico.
- D. Every fall, monarch butterflies migrate thousands of miles from southern Canada and the United States to Mexico, seeking warmer climates.



To combine sentences, ask yourself

1. Are there any repeated words/ideas that can instead be used just once?
2. How are the different ideas connected? Do they represent a cause and effect, opposing ideas, a sequence, etc.?

#### Sample 1 Explanation

(F) Sentence 2 of the paragraph should be revised to correct the errors in verb tense and pronoun agreement. The paragraph is in the present tense, and so the past tense *visited* needs to be changed to *visit*. Additionally, the plural pronoun *they* needs to be changed to the singular pronoun *it* because the pronoun refers to the park, which is a singular noun. Option F is correct because the revisions in the option correct these errors.

#### Sample 2 Explanation

(B) Sentence 2 is the correct answer because the phrase, "As one of the many museums and landmarks of the Smithsonian Institution," is intended to describe NASM, but because of the structure of the sentence, it describes "millions of people" instead. It is nonsensical to describe "millions of people" as "one of the many museums and landmarks of the Smithsonian Institution." A revised version of this sentence could be, "Each year, millions of people from around the world visit NASM, one of the many museums and landmarks of the Smithsonian Institution." In this revised version, the modifying phrase immediately follows "NASM."

#### Sample 3 Explanation

(D) Option D is the best way to combine these sentences because it presents the ideas clearly and precisely, and it shows the relationship between the key ideas of when, why, how far, and where monarch butterflies migrate.

## Overview of Revising/Editing Part B

Questions in Part B assess your ability to read a text and then make decisions that improve the overall quality of the writing. The subjects presented in these texts will include historical and current events and people, places, technology, and phenomena in the biological sciences, physical sciences, and social sciences. Each sentence is numbered so that you can quickly locate and refer to specific parts of the passage.

The text may contain errors such as

- language misuse
- missing or unnecessary supporting details
- missing or inappropriate transitional words, phrases, or sentences
- a missing or an unclear introductory statement or concluding statement
- confusing or illogical organization
- other errors related to language and writing standards



### Tips for Revising/Editing Part B

First, read the text carefully while being mindful of time; don't skim.

- You need to understand the author's purpose, main idea, and supporting details of the text in order to answer questions about how the text could be better developed and organized, which requires careful reading.
- You may notice sentences and paragraphs that seem confusing, illogical, unnecessary, disorganized, or generally difficult to read.
- Note that the order in which you should read the text and question(s) for Part B is different from Part A. In Part A, you should read the *question* first. In Part B, you should read the *text* first.

Next, read each question carefully, while being mindful of time.

- Refer back to the text and re-read the relevant sentences or paragraphs that are mentioned in the question.
- You will also likely need to skim the sentence before and after the sentence that is referenced in a question.
- Consider each answer option, re-reading the text as necessary, and as time permits, to determine whether the option represents the best revision.



- Before test day, plan how much time you will spend on Part B; this will help you to be efficient when answering each question on test day.

## Sample Questions for Revising/Editing Part B

### Studying Religions

(1) According to the National Council for the Social Studies, “knowledge about religions is not only a characteristic of an educated person but is necessary for effective and engaged citizenship in a diverse nation and world.” (2) In support of this idea, the world history standards in most states in this country include a basic overview of the five major world religions. (3) While public schools are not allowed to promote one religion over another, school officials should understand that the study of world religions through an academic lens is an essential component of history and social studies instruction and needs to be part of every student’s education.

(4) It is impossible to deny the role that religion plays in history, literature, and current events.

(5) Some schools and teachers are hesitant to educate students about world religions. (6) The First Amendment to the United States Constitution guarantees the separation of church and state, which makes the discussion of religion in public schools seem problematic to some school districts and teachers. (7) A 2010 survey by Pew Research Center found that more than half of those polled thought teachers were prohibited from teaching classes about religions.

(8) An understanding of different world religions enriches a student’s education in several ways.

(9) The politics, economics, and laws of countries are often a by-product of religious ideas, and literary and cultural references are better understood through the context of religion. (10) The benefits of this knowledge extend beyond the classroom. (11) Students who get world religions do better when they start working with people who come from different backgrounds. (12) They can appreciate the traditions and values of their neighbors and co-workers and can form educated opinions regarding current events and world issues. (13) A comprehensive study of world religions will help students become informed adults.



The question focuses on supporting the full argument presented across the text. Therefore, you have to read and understand the *whole* text, not just ideas located in sentence 6 or the second paragraph.

1. Which sentence would best follow sentence 6 to support the argument presented in the passage?
- A. Some educators avoid the topic altogether, and as a result, many students are not studying the founding ideas of culture and society.
  - B. Many teachers are worried about the risk of introducing ideas or concepts that may lead to controversy.
  - C. Schools tend to spend more resources teaching mathematics and the physical sciences than teaching the humanities.
  - D. In order to protect students’ personal beliefs, many teachers think that they should teach only limited ideas about world religions.

2. Which transition phrase should be added to the beginning of sentence 10?
- E. In addition to being more aware of the world
  - F. With so many global ideas being based around a religious framework
  - G. While awareness and understanding of world religions is important
  - H. On top of gaining a better academic understanding of the world
3. Which revision of sentence 11 uses the most precise language?
- A. Students who are clued into world religions are likely to get along better with the people they work with who are from different places.
  - B. Students who know about world religions are likely to understand more about doing business with new people.
  - C. Students who understand world religions are better equipped to participate in a diverse global workplace.
  - D. Students who are familiar with world religions may be more aware of how to do business with acquaintances from other countries.

### Sample 1 Explanation

(A) Sentence 6 states that there is a constitutional foundation for the separation of church and state in the United States and suggests that because of this separation, some educators are unsure of how to address religion in the classroom. The question asks for a sentence that would follow and further expand on the ideas in sentence 6 and relate to the main claim in the passage. Option A is the only option that explains and makes a connection between educators avoiding the topic of religion and the subsequent impact on a student's education.

### Sample 2 Explanation

(H) Sentence 10 is leading into the idea that having an understanding of world religions is also important outside of the classroom. By explaining the benefits of understanding world religions outside of an educational context (sentences 11 and 12), the author is providing further support for the argument that learning about world religions is important. The transition phrase in Option H best conveys that sentence 10 is transitioning to new supporting evidence for the argument "on top of" what is stated in sentence 9.

### Sample 3 Explanation

(C) Sentence 11 uses vague and imprecise language and needs to be corrected. For example, "students who *get* world religions" is an imprecise way of saying "students who *understand* world religions." Of all the available options, Option C uses the most precise language ("understand," "better equipped," "diverse global workplace").

## Overview of Reading Comprehension

This section assesses your ability to read and comprehend six texts of both literary and informational genres, which may include any of the text types listed below.

Informational genre may include	Literary genre may include
expository/explanatory texts	poetry
argumentative texts	adventure stories
functional text in the form of:	historical fiction
• personal essays	mysteries
• speeches	myths
• opinion pieces	science fiction
• essays about art or literature	realistic fiction
• biographies	allegories
• memoirs	parodies
• journalism	satire
• historical, scientific, technical, or economic accounts written for a broad audience	



## Tips for Reading Comprehension

Read the text carefully while being mindful of time; don't skim.

- Read the text carefully to ensure you have an accurate and text-based understanding of both the big ideas and important details.
- Monitor your comprehension while you read; if a sentence or paragraph is confusing, try quickly re-reading it.

Take notes.

- Jot *brief* notes to identify important details, summarize ideas, etc., while reading the text in its entirety.

Read the question carefully.

- Read the question carefully so that you clearly understand what the question is asking. For example, do you need to focus on details in just one paragraph or multiple paragraphs?
- If time permits, re-read the relevant part or parts of the text.

Try to determine the answer before reading the answer choices.

- Think of the answer before reading each option. Then read each answer option, eliminating ones that definitely seem incorrect, and choose the one that best matches your thinking.
- Base your answers only on the content of the text (and associated images or graphics where relevant). Do not depend on your prior knowledge of the topic.



- Before test day, plan how much time you will spend on each of the six texts and their related questions in the Reading Comprehension section; this will help you to be efficient when answering each question on test day.

### Finding Flavor

- 1 When you eat an orange, your experience of its flavor comes from the combination of its aroma and its taste. Taste buds, the sensory receptors on the tongue, convey information to the brain about chemicals in food while the food dissolves in saliva. The sense of smell comes into play when the olfactory nerve in the nasal passages senses even very low concentrations of food chemicals in gaseous form. The sense of smell has a larger role in tasting flavors than most people realize—that is, until they have a stuffy nose and nothing tastes good.
  - 2 If taste and smell depend on our detection of food chemicals, one might expect that chemists would be able to duplicate the flavors of foods. In fact, a surprising number of popular food flavors can now be reproduced in the laboratory, and even more are on the way. Orange, perhaps the most popular flavor worldwide, has been reproduced successfully. So have some national favorites, including cashew (Latin America) and paprika (Hungary). Synthetic flavors are not limited to flavoring food; they are also added to mouthwashes, toothpastes, beverages, and other consumer products.
  - 3 Only a small proportion of the chemical components occurring naturally in foods actually contributes to their flavor. To identify these critical components, scientists use a gas chromatograph to separate a food into its basic chemical constituents. Flavor experts, called flavorists, then attempt to isolate those chemicals that are essential to the distinctive flavor of a food. Mechanical techniques have been developed to capture the aromas of food as it is being prepared—such as the smell of baking bread—and distill the essential chemicals from these essences. Flavorists use their highly developed senses of taste and smell to attempt to produce acceptable flavorings that are chemically identical to, but purer than, flavors that are naturally present in unprocessed food.
  - 4 Although American consumers claim to want “natural” flavors in their food, taste tests demonstrate that they often prefer the synthetically produced counterparts. Artificial flavors tend to be stronger and less subtle than natural flavors. For example, many Americans prefer a soft drink created with artificial flavors, such as orange soda, over an “all-natural” soda flavored with real oranges, which may taste weak in comparison. In fact, some flavorists worry that consumers will develop such a strong taste for artificial flavors that natural flavorings, usually more expensive than their artificial counterparts, will become scarce.
  - 5 Researchers have not always been successful in their efforts to duplicate natural flavors. Some popular flavors, such as coffee, strawberry, and chocolate, have proved to be virtually impossible to reproduce. The difficulty in creating a flavor like chocolate, experts say, is its complexity—a mysterious combination of sweet and bitter that excites the taste buds in an unusual and satisfying way.
1. What is the primary goal of the scientific research described in paragraph 3?
    - A. to predict consumer taste preferences in food
    - B. to develop food with strong flavors
    - C. to produce synthetic equivalents of natural food flavors
    - D. to improve the natural flavors in unprocessed food

2. Which conclusion is best supported by the information about the collection of aromas during food preparation?
- E. Creating artificial flavors from captured aromas is a difficult process.
  - F. Certain chemical components of a food's flavor are present in its aroma.
  - G. Most people cannot tell the difference between natural flavors and artificial flavors.
  - H. The natural flavor of a food is usually enhanced during the cooking process.
3. Why does the author mention orange soda in paragraph 4?
- A. to suggest that consumer preferences for natural or artificial flavors vary
  - B. to explain why natural flavors are more expensive than artificial substitutes
  - C. to demonstrate that consumers sometimes prefer artificial flavors to natural flavors
  - D. to give an example of a natural flavor that may become difficult to find in the future
4. The author includes details about the uses for synthetic flavors in paragraph 2 in order to
- E. show that synthetic flavors are easy to create.
  - F. demonstrate that many items are made with the same synthetic flavor.
  - G. suggest that synthetic flavors are healthier than natural flavors.
  - H. highlight that synthetic flavors are found in a variety of everyday items.

#### Sample 1 Explanation

(C) Paragraph 3 describes a technique for separating a food into its basic chemical components. Option C best summarizes the goal of this research.

#### Sample 2 Explanation

(F) The details about the process of collecting aromas during food preparation described in paragraph 3 support the conclusion that the chemical components that make up a food's flavor are present in its aroma.

#### Sample 3 Explanation

(C) Orange soda is mentioned in paragraph 4 to provide an example of a product that uses a synthetic flavor that some consumers prefer to its natural counterpart (Option C).

#### Sample 4 Explanation

(H) The author describes the uses of synthetic flavors in items such as "mouthwashes, toothpastes, beverages" (paragraph 2) to demonstrate that synthetic flavors are found in many everyday household products.

## 9.5 How to Prepare for the Math Section

The Math section consists of word problems and computational questions in either a grid-in or multiple-choice format. There are five grid-in questions and 52 multiple-choice questions. The Math questions involve application of topics, mathematical terms, and general concepts from the **Common Core Learning Standards for Mathematics**. However, as one of the purposes of this test is to identify students who will benefit from an education at a Specialized High School, the SHSAT Math items will require you to apply familiar Math skills to complex, multi-step problems.

Math questions on the Grade 8 test forms are based on the Common Core Learning Standards through Grade 7. Math questions on the Grade 9 test forms are based on material through Grade 8.

The following pages outline a variety of tips to help you prepare for taking the Math section on the SHSAT. They include the following:

- tips to improve your Math skills in Math topics you need more practice with
- tips to familiarize you with expectations that are specific to the SHSAT and may therefore be different from other Math tests you take
- tips specifically for answering multiple-choice Math questions
- tips specifically for answering Math grid-in questions

**Note:** Answers and answer explanations for all the Math sample items can be found on pages 46–48.



### Tips to Improve Your Math Skills

#### Review Math resources.

- Use your Math textbook, seek out other Math resources at school or at your local library, or ask your teacher to recommend resources for you to use.

#### Practice solving Math questions every day. Solve both basic and challenging questions.

- Basic questions reinforce Math skills such as simplifying fractions and applying the concept of statistics.
- More challenging questions require setting up complex equations with multiple steps. They may also require using various types of Math skills. For example, you may use fractions, solve for equations, and apply your knowledge of statistics to answer one question.
- If you are unsure of how to answer a question, skip it and return to it after answering the other questions. You may have a better idea of how to solve a problem after completing other questions.



## Things to Keep in Mind While Preparing for the Math Section

Memorize mathematical terms, symbols, and formulas that you use in your Math class.

- ▶ You must know the meanings of mathematical terms that are appropriate for your grade level, such as “parallel” and “perpendicular,” as well as the symbols that represent those terms.
- ▶ You can find mathematical terms, symbols, and formulas, such as those for perimeter and area of different figures, in the materials for your Math classes and online in the Grade 7 and 8 Common Core Learning Standards.
- ▶ Definitions and explanations for terms, symbols, and formulas will NOT be given in the test booklet. Practice using them to solve questions until you have memorized them and can use them with ease.

Do not use a calculator when solving questions.

- ▶ The use of calculators is **not** permitted while taking the test.



- ▶ Before test day, plan how much time you will spend on the Math section; this will help you to be efficient when answering each question on test day.



## Tips for Solving Math Problems

Read each question carefully.

- ▶ Read carefully so that you accurately set up complex problems using *all* the important information from the question.
- ▶ Mark up the question, as in Sample 1, to ensure you include all the information when solving the problem.
- ▶ Change words from the question into mathematical symbols (as noted in Sample 1 and Sample 2).

### Sample 1

The <sup>+</sup>sum of <sup>x, x+1</sup>two consecutive integers <sup>= -15</sup>is -15. If 1 is added to the smaller integer and 2 is subtracted from the larger integer, what is the **product** of the two resulting integers?



Mark up the question to prepare for solving the problem.

### Sample 2

<sup>J</sup>Jenny starts a game with twice as many marbles as <sup>K</sup>Keiko. <sup>J-5</sup>Jenny gives Keiko 5 marbles but she still has 10 more than Keiko. How many marbles did Jenny have to start with?

- A. 25
- B. 30
- C. 35
- D. 40

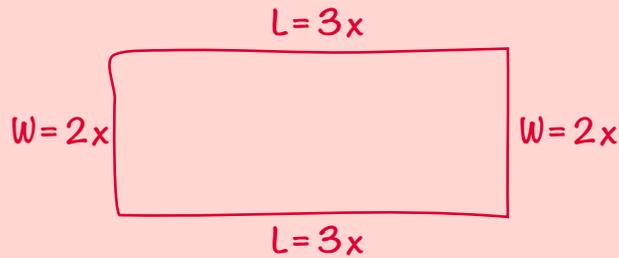


Change words from the question into mathematical symbols.

Draw figures or diagrams for questions that do not have them.

➤ Draw figures or diagrams, like in the example below, to help you visualize what the question is describing.

### Sample 3



The perimeter of a rectangle is 510 centimeters. The ratio of the length to the width is 3:2. What are the dimensions of this rectangle?

- E. 150 cm by 105 cm
- F. 153 cm by 102 cm
- G. 158 cm by 97 cm
- H. 165 cm by 90 cm



Label figures and diagrams.

Take one step at a time.

► Some questions ask you to combine a series of steps. Write out one step at a time, like in the example below, to solve multi-step problems.

#### Sample 4

$$\begin{aligned}1 \text{ dollar} &= 7 \text{ lorgs} \\ 1 \text{ dollar} &= 0.5 \text{ dalt}\end{aligned}$$

Malik has 140 lorgs and 16 dalts. If he exchanges the lorgs and dalts for dollars according to the rates above, how many dollars will he receive?

- A. \$28
- B. \$52
- C. \$182
- D. \$282

$$\frac{140}{x} = \frac{7}{1}$$

$$7x = 140$$

$$x = \$20$$

$$\frac{16}{x} = \frac{0.5}{1}$$

$$0.5x = 16$$

$$x = \$32$$

$$20 + 32 = \$52$$



Step 1: Convert lorgs to dollars.



Step 2: Convert dalts to dollars.



Step 3: Add your conversions of lorgs and dalts together.



## Tips for Math Multiple-Choice Questions

Most multiple-choice questions should be done by working out the answer.

- ▶ Solving the problem *before* looking at the answer choices is more efficient than looking first at the answer choices and *then* trying to solve each one to get to the correct answer.

It is best to solve problems on paper (rather than just in your head) and to focus on *solving* rather than *selecting*.

- ▶ When solving the problem, try not to be distracted by the four answer options you will need to choose from. Focus first on solving the problem rather than choosing an answer.
- ▶ When you get an answer, look at the choices listed. If your answer is included among the choices, mark it. If it is not, reread the question and solve it again.
- ▶ If your answer is not among the answer choices, consider other ways to write your answer. For example;  $\frac{5}{9}(3 + x)$  is equivalent to all of the following:  
 $\frac{5(3 + x)}{9}$  and  $\frac{5}{3} + \frac{5}{9}x$  and  $\frac{5}{3} + \frac{5x}{9}$ .
- ▶ If your answer is still not among the answer choices, make your best guess and/or come back later if you have time.

### Sample 1 Explanation

If  $x$  is the smaller consecutive integer, then  $x + 1$  is the larger consecutive integer. Use their sum  $-15$  to find  $x$ :

$$x + (x + 1) = -15$$

$$2x + 1 = -15$$

$$2x = -16$$

$$x = -8$$

The two consecutive integers are  $-8$  and  $-7$ .

One is added to the smaller integer:

$$-8 + 1 = -7, \text{ and } 2 \text{ is subtracted from the larger integer: } -7 - 2 = -9.$$

Find the product:  $-7 \times -9 = 63$ .

### Sample 2 Explanation

(D) Set up some equations.

Jenny ( $J$ ) has twice as many marbles as Keiko ( $K$ ):  $J = 2K$

Jenny gives Keiko 5 marbles, so now they each have:  $J - 5$  and  $K + 5$  marbles.

Jenny still has 10 more than Keiko:

$$J - 5 = (K + 5) + 10$$

To find how many marbles Jenny had to start with, solve  $J = 2K$  for  $K$  and substitute that into the second equation:

In equation  $J = 2K$ , solve for  $K$ :  $K = \frac{J}{2}$ .

Substitute  $\frac{J}{2}$  in for  $K$ .

$$J - 5 = (K + 5) + 10$$

$$J - 5 = \left(\frac{J}{2} + 5\right) + 10$$

$$J - 5 = \frac{J}{2} + 15$$

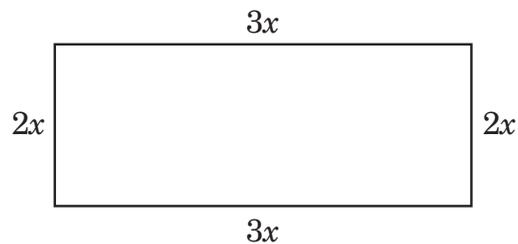
$$\frac{J}{2} = 20$$

$$J = 40 \text{ marbles}$$

### Sample 3 Explanation

(F) Let  $2x =$  the width and  $3x =$  the length.

Draw the rectangle to help visualize.



Since 2 times width + 2 times length = perimeter, we get

$$2(2x) + 2(3x) = 510$$

$$4x + 6x = 510$$

$$10x = 510$$

$$x = 51$$

$$2x = 102\text{cm and } 3x = 152 \text{ cm}$$

**Sample 4 Explanation**

(B) Use proportions to make the conversions:

**Lorgs to dollars:**

$$\frac{140}{x} = \frac{7}{1}$$

$$7x = 140$$

$$x = \$20$$

**Dalts to dollars:**

$$\frac{16}{x} = \frac{0.5}{1}$$

$$0.5x = 16$$

$$x = \$32$$

$$\text{Total dollars} = 20 + 32 = \$52$$

## How to Complete Math Grid-In Questions

The Math section includes five grid-in questions for which students must solve computational questions and provide the correct numerical answer rather than selecting the answer from multiple-choice options.

- ▶ The grid for each question is made up of five columns. When you record your answer in the grid, begin on the left.
- ▶ For each grid-in question, write your answer in the boxes at the top of the grid.
- ▶ Print only one number or decimal symbol in each box. Use the "." symbol if your response includes a decimal point.
- ▶ Fill in the circle under the box that matches the number or symbol that you wrote.

EXAMPLE A  
(Answer: 5)

Write the answer in these boxes. →

	5			
	-	.	.	.
	0	0	0	0
	1	1	1	1
	2	2	2	2
	3	3	3	3
	4	4	4	4
	●	5	5	5
	6	6	6	6
	7	7	7	7
	8	8	8	8
	9	9	9	9

Fill in the circles that correspond to the answer written in the boxes.

EXAMPLE B  
(Answer: 3.2)

Negative sign →

	3	.	2	
	-	.	.	.
	0	0	0	0
	1	1	1	1
	2	2	●	2
	●	3	3	3
	4	4	4	4
	5	5	5	5
	6	6	6	6
	7	7	7	7
	8	8	8	8
	9	9	9	9

← Decimal point



## How to Answer Math Grid-In Questions (*continued*)

- Do not leave a box blank in the middle of an answer. If there is a blank in the middle of your answer, it will be scored as incorrect. For example, if your answer is 308, **Example F** is the acceptable way to grid in your response. In **Example G**, there is a space between the 3 and the 8 rather than a 0—this is an unacceptable way to grid in your response and will be scored as incorrect.

EXAMPLE F  
(Answer: 308)

	3	0	8	
-	.	.	.	.
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

EXAMPLE G  
(Answer: 38)

	3		8	
-	.	.	.	.
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

- Do not fill in a circle under an unused box, as in **Example H**. The answer recorded in Example H will be scored as 3,080 because the circle in the last column for 0 is filled in, even though the intended response is 308.

EXAMPLE H  
(Answer: 3080)

	3	0	8	
-	.	.	.	.
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

### Important Notes about Grid-Ins

For your answer to be scored, the circles in the grid must be filled in. If you write an answer in the boxes but do not fill in the circles in the grid, your answer will not be scored.

A complete numerical response that is correct will be scored as correct, even if you accidentally begin recording in the wrong column.

If you accidentally add a decimal point (with no additional values or zeros) after a whole number, your answer will be scored as that whole number. For example, if your answer is 5, as in Example A, an answer that is filled in as "5." or "5.0" will be considered an answer of "5" in scoring.

**Double-check how you have filled in the circles for each grid.** If there is more than one circle filled in for a column, your answer will be scored as incorrect. If your answer written in the boxes does not match how you have filled in the circles, your score will be based on how you have filled in the circles, like in Example H.

- ✓ There are two Grade 8 Sample Tests in this handbook.

\*If you are taking the Grade 9 test, take the Grade 8 Sample Tests and practice the Math questions on page 217 that are specific to the Grade 9 SHSAT. These questions cover topics that are introduced in the Grade 8 curriculum.

- ✓ Additional sample grid-in questions for Grade 8 are on page 224.
- ✓ Two detachable sample SHSAT answer sheets are provided in the back of the handbook. Use one to mark your answers for Sample Test A, and use the other to mark your answers for Sample Test B.

You are now ready to try Sample Test Form A.

- Begin by carefully reading the Directions on pages 54 and 55 and filling out Side 1 of the answer sheet on page 231.
- Use Side 2 of the answer sheet to fill in your answers for Form A.
- When you are ready for Form B, use the second detachable answer sheet on page 233.

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# NEW YORK CITY PUBLIC SCHOOLS

## *2019 Specialized High Schools*

# ADMISSIONS TEST

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## GENERAL DIRECTIONS

### Identifying Information

Turn to Side 1 of the answer sheet. **Line 1** says, “I am well enough to take this test and complete it. I understand that once I break the seal of the test booklet, I may not be eligible for a make-up test. I am a New York City resident and a Grade 8 student taking a Grade 8 test. I understand that a student who is not a New York City resident, who takes the test more than once in a given school year, or who takes the test at the wrong grade level will be disqualified from acceptance to any of the Specialized High Schools.” Sign your name in the space following the word “signature.” Do not print your name. **Notify the proctor immediately if you are ill or should not be taking this test. Do not sign the statement or begin the test. Return your answer sheet to the proctor.**

On **Line 2**, print today’s date, using the numbers of the month, the day, and the year. On **Line 3**, print your birth date with the number of the month first, then the number of the day, then the last two digits of the year. For example, a birth date of March 1, 2005, would be 3-1-05.

In **Grid 4**, print the letters of your first name, or as many as will fit, in the boxes. Write your name exactly as you did on the application. If you have a middle initial, print it in the box labeled “MI.” Then print the letters of your last name, or as much as will fit, in the boxes provided. Below each box, fill in the circle that contains the same letter as the box. If there is a space or a hyphen in your name, fill in the circle under the appropriate blank or hyphen.

Make **dark marks** that **completely fill the circles**. If you change a mark, be sure to erase the first mark completely.

**Grid 5** is for your choice of Specialized High Schools. If Grid 5 is not marked correctly, your admission to a Specialized High School will be affected because your admission is based on the score you achieve and the order in which you rank your school preferences in this grid. The school choices indicated on your answer sheet are final. Therefore, carefully copy the order in which you ranked the schools on your Test Ticket onto Grid 5.

**Fill in one and only one circle for each school for which you wish to be considered.** You may make as few as one or as many as eight choices. To increase your chances of being assigned to one of the Specialized High Schools, you are encouraged to make more than one choice. You **must** fill in a first choice school. Do not fill in a school more than once. Do not fill in the same school for each choice. Fill in only one circle in a row and only one circle in a column.

**Grid 6** asks for your date of birth. Print the first three letters of the month in the first box, the number of the day in the next box, and the year in the last box. Then fill in the corresponding circles.

In **Grid 7**:

1. Print the name of the school where you are now enrolled in the space at the top of the grid.
2. In the boxes marked “SCHOOL CODE,” print the six-digit code that identifies your school and fill in the circle under the corresponding number or letter for each digit of the school code. (You can find your school code on your Test Ticket. If it is not there, tell the proctor, and the proctor will get the school code for you.)
3. If you attend a private or parochial school, fill in the circle marked “P.”

**Grid 8** is labeled “STUDENT ID NUMBER.” All test-takers should print their student ID number in Grid 8. The student ID number is found on your Test Ticket. In the boxes, print your nine-digit student ID number. Below each box, fill in the circle containing the same number as in the box.

**DO NOT OPEN THIS BOOKLET  
UNTIL YOU ARE TOLD TO DO SO  
TURN YOUR BOOKLET OVER TO THE BACK COVER**

## GENERAL DIRECTIONS, continued

### Identifying Information, continued

**Grid 9** is labeled “BOOKLET LETTER AND NUMBER.” In most cases, Grid 9 is already filled in for you. If it is not, copy the letter and numbers shown in the upper-right corner of your test booklet into the boxes. Below each box, fill in the circle containing the same letter or number as the box.

Now review Side 1 to make sure you have completed all lines and grids correctly. Review each column to see that the filled-in circles correspond to the letters or numbers in the boxes above them.

Turn your answer sheet to Side 2. Print your test booklet letter and numbers, and your name, first name **first**, in the spaces provided.

### Marking Your Answers

Mark each of your answers on the answer sheet in the row of circles corresponding to the question number printed in the test booklet. Use only a Number 2 pencil. If you change an answer, be sure to erase it completely. Be careful to avoid making any stray pencil marks on your answer sheet. Each question has only one correct answer. If you mark more than one circle in any answer row, that question will be scored as incorrect. See the example of correct and incorrect answer marks below.

SAMPLE ANSWER MARKS				
(A)	(B)	(C)	●	RIGHT
( <del>A</del> )	(B)	(C)	(D)	WRONG
(A)	( <del>B</del> )	(C)	(D)	WRONG
(A)	(B)	( <del>C</del> )	(D)	WRONG
(A)	(B)	●	●	WRONG

You can use your test booklet or the provided scrap paper to take notes or solve questions; however your answers must be recorded on the answer sheet in order to be counted. You will not be able to mark your answers on the answer sheet after time is up, and answers left in the test booklet will not be scored.

**DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.**

### Planning Your Time

You have 180 minutes to complete the entire test. How you allot the time between the English Language Arts and Mathematics sections is up to you. **If you begin with the English Language Arts section, you may go on to the Mathematics section as soon as you are ready. Likewise, if you begin with the Mathematics section, you may go on to the English Language Arts section as soon as you are ready.** If you complete the test before the allotted time (180 minutes) is over, you may go back to review questions in either section.

Be sure to read the directions for each section carefully. Each question has only one correct answer. Choose the best answer for each question. When you finish a question, go on to the next, until you have completed the last question. Your score is determined by the number of questions you answer correctly. **Answer every question, even if you may not be certain which answer is correct.** Don't spend too much time on a difficult question. Come back to it later if you have time. If time remains, you should check your answers.

Students must stay for the entire test session.

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO**



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# A



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Printed in the USA

ISD19819

# SAMPLE TEST, FORM A

## PART 1 — ENGLISH LANGUAGE ARTS

57 QUESTIONS

### REVISING/EDITING

QUESTIONS 1–9

#### IMPORTANT NOTE

The Revising/Editing section (Questions 1-9) is in two parts: Part A and Part B.

#### REVISING/EDITING Part A

**DIRECTIONS:** Read and answer the following questions. You will be asked to recognize and correct errors so that the sentences or short paragraphs follow the conventions of standard written English. You may write in your test booklet as needed to take notes. You should re-read relevant parts of the sentences or paragraphs, while being mindful of time, before marking the best answer for each question.

1. Read this paragraph.

(1) Danielle spent several hours preparing for an upcoming audition for a play at the community theater. (2) First she did vocal exercises to practice her diction and projection so that her words would carry clearly throughout the large auditorium. (3) Then she studies the text of the monologue to better understand the emotions, and motivations of the character she plans to portray. (4) Finally she recited her monologue in front of a mirror many times, making slight adjustments and improvements to her performance each time.

How should the paragraph be revised?

- A. Sentence 1: Change *spent* to **had spent**, AND insert a comma after *play*.
- B. Sentence 2: Change *did* to **does**, AND insert a comma after *projection*.
- C. Sentence 3: Change *studies* to **studied**, AND delete the comma after *emotions*.
- D. Sentence 4: Change *recited* to **recites**, AND delete the comma after *times*.

2. Read this paragraph.

The land on Earth has not always been separated into the seven continents, at one time a massive supercontinent, known as Pangaea, covered one-third of Earth's surface. Additionally, the supercontinent was surrounded by ocean waters called Panthalassa, much of which were in Earth's Southern Hemisphere. Geologists believe that the supercontinent split apart over millions of years because of the movement of the tectonic plates that form Earth's crust. In fact, experts predict that over the next 250 million years the movement of the plates will cause the seven continents to merge into a supercontinent again.

Which revision corrects the error in sentence structure in the paragraph?

- E. continents. At
  - F. surface; additionally,
  - G. Panthalassa. Much
  - H. crust, in fact,
3. Read this paragraph.

(1) In 1976 the National Basketball Association (NBA) absorbed several teams of the American Basketball Association (ABA), including the New York Nets, who played in the Long Island area at the time. (2) The owner of the Nets decided to take the team to New Jersey after the team had financial troubles, where the Nets played for thirty-five seasons. (3) The New Jersey Nets had sixteen playoff appearances, including two appearances in the NBA finals. (4) Then in 2012, after a change in ownership, the team returned to New York and began playing under the name the Brooklyn Nets.

Which sentence contains an error in its construction and should be revised?

- A. sentence 1
- B. sentence 2
- C. sentence 3
- D. sentence 4

4. Read these sentences.

(1) Flyby missions near Jupiter have been happening since 1973.

(2) Flyby missions allow scientists to collect data about Jupiter and its moons.

What is the best way to combine the sentences to clarify the relationship between the ideas?

- E.** While flyby missions near Jupiter have been happening since 1973, scientists collect data about the planet and its moons.
- F.** Although there have been flyby missions near Jupiter since 1973, they have allowed scientists to collect data about the planet and its moons.
- G.** Flyby missions near Jupiter, which allow scientists to collect data about the planet and its moons, have been happening since 1973.
- H.** Flyby missions have been happening near Jupiter, but scientists have been collecting data about the planet and its moons since 1973.

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## REVISING/EDITING Part B

**DIRECTIONS:** Read the text below and answer the questions following it. You will be asked to improve the writing quality of the text and to correct errors so that the text follows the conventions of standard written English. You should re-read relevant parts of the text, while being mindful of time, before marking the best answer for each question.

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### Cracking the Code

(1) Computer code is part of every electronic interaction, from video games to home thermostats to vehicle GPS systems. (2) Code is a language that computers can interpret, and programmers use it to instruct computers to perform different tasks, such as finding, sorting, or calculating data. (3) People who code have to learn this language. (4) They can construct programs that will perform detailed tasks. (5) The programs can also perform complex tasks.

(6) A coding language uses letters, numbers, and symbols that are arranged in a way that makes sense to a computer. (7) The code that makes up a program tells a computer how to process information. (8) Studying a coding language involves learning the rules for combining phrases and instructions so that they are recognizable to the computer. (9) Once a person understands coding rules, the possibilities for applying them are infinite.

(10) Coding skills are becoming important in many occupational fields. (11) For example, code can be used to create programs to track, analyze, and predict changes in the stock market. (12) Code can also be designed to help doctors track and monitor a patient’s health. (13) Jobs that require coding skills are typically higher paying, offering salaries that are up to as much as \$22,000 a year more than jobs that do not require coding knowledge.

(14) People have a variety of opportunities to learn how to code. (15) In some schools, young people can study computer science and coding just as they study foreign languages. (16) Computer science teachers can use websites and apps that employ games designed to help everyone understand how code works. (17) Even high school students who do not take computer science can learn coding by attending coding workshops and online classes or by watching tutorials online. (18) After studying the basics of coding, some students may become interested in learning how to create programs, such as games and apps.

(19) The late Steve Jobs, a pioneer in computer technology, once said, “Everybody in this country should learn how to program a computer . . . because it teaches you how to think.” (20) Learning to code can seem challenging, but one does not need to become an expert programmer to reap the benefits of understanding this language.

5. What is the best way to combine sentences 3 through 5 to clarify the relationship between ideas?
- A. People who code have to learn this language because they can construct programs that will perform detailed and complex tasks.
  - B. People who code have to learn this language so they can construct programs that will perform detailed or complex tasks.
  - C. When people who code have to learn this language, it is so they can construct programs that will perform detailed and complex tasks.
  - D. If people who code have to learn this language, then they can construct programs that will perform detailed as well as complex tasks.
6. Which sentence should follow sentence 5 to best state the main claim in the passage?
- E. People should take advantage of opportunities to study and learn basic coding because of its many valuable benefits.
  - F. People should attempt to understand how code can be used to design programs that are beneficial for a variety of industries and businesses.
  - G. Schools should offer coding classes because knowing how to code will help students succeed in many types of businesses.
  - H. Students should prepare for the future job market by studying code and learning how to code programs.
7. Which revision of sentence 10 provides the best transition to the argument in the third paragraph (sentences 10–13)?
- A. Learning a coding language may be difficult, but coding skills are becoming important in many occupational fields.
  - B. Learning a coding language is useful because coding skills are becoming important in many occupational fields.
  - C. Employers in most industries realize that coding skills are becoming important in many occupational fields.
  - D. Even though programming is its own unique field, coding skills are becoming important in many occupational fields.

8. Which sentence would best follow sentence 13 and support the ideas in the third paragraph (sentences 10–13)?
- E. Experienced programmers, software engineers, and system administrators at large companies can earn well over \$100,000 a year.
  - F. Hospitals, physicians’ offices, and pharmaceutical companies are frequently looking to hire people who code to help with a variety of tasks.
  - G. Many companies are eager to hire employees who have experience in a specific industry as well as knowledge of basic coding.
  - H. According to a report from a job market analytics firm, almost half of today’s jobs paying more than \$58,000 a year call for some level of coding ability.
9. Which concluding sentence would best follow sentence 20 and support the argument presented in the passage?
- A. People should understand that knowing how to code is becoming an essential requirement for most high-paying jobs.
  - B. By understanding basic coding concepts, people can participate in an increasingly digital marketplace.
  - C. Students who want to secure a high-paying job in the technology industry should become proficient in coding.
  - D. Since coding is a valuable marketplace skill, today’s students should begin to write their own computer programs.

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# READING COMPREHENSION

## QUESTIONS 10–57

**DIRECTIONS:** Read each of the following six texts, and answer the related questions. You may write in your test booklet as needed to take notes. You should re-read relevant parts of each text, while being mindful of time, before marking the best answer for each question. Base your answers only on the content within the text.

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## A Miracle Mile

- 1 In the 1950s people compared running one mile in four minutes to scaling Mount Everest and nicknamed the feat a “dream mile.” Although such an accomplishment was considered humanly impossible, several elite runners aimed to break that supposedly impenetrable barrier. One of them was a twenty-five-year-old medical student named Roger Bannister.
- 2 Roger Bannister had tasted failure during the 1952 Olympics. There, he was favored to win the 1,500-meter competition, a distance slightly shorter than a mile, but he finished in a dismal fourth place instead. Bannister’s performance was a disappointment for him and his country, Great Britain. Determined to redeem himself, Bannister postponed his plans to retire from racing and focused on the ultimate prize—breaking the four-minute-mile barrier.
- 3 Bannister attacked the elusive milestone with a positive attitude and logical planning. The amateur athlete decided to use intensive interval training to develop endurance and speed. For these workouts, Bannister ran an interval of ten consecutive laps on a quarter-mile track, aiming for sixty seconds each lap. In between intervals, he let his body recover for two minutes.
- 4 By early 1954, Bannister had succeeded in lowering his quarter-mile pace to sixty-one seconds, but he had to shave off at least one more second in order to reach his target. Frustrated by the plateau he had reached, Bannister took a break from training and went mountain climbing for three days. The rest from running permitted his muscles to recuperate and left him feeling refreshed. When Bannister returned to the track, he completed ten quarter-mile-long intervals at fifty-nine seconds each. He finally felt prepared to attempt to break the world record.
- 5 As a member of the Amateur Athletic Association (AAA), Bannister joined the AAA team for a track meet against Oxford University. The event took place on a cinder track in Oxford on May 6, 1954. Bannister and his two AAA teammates, Chris Chataway and Chris Brasher, were close friends and frequent running partners. Chataway and Brasher agreed to help Bannister accomplish his goal by being his “rabbits.”
- 6 In track and field, rabbits are runners who enter the race solely to pace a teammate for a segment of the course. Typically, a runner settles in behind the rabbit and allows the rabbit to set an appropriate tempo. Additionally, by running behind the rabbit, the runner conserves about 15 percent of his or her effort. When the starting pistol fired, Brasher pounced into the lead, and Bannister followed behind his first rabbit.
- 7 Propelled by the excitement, Bannister lost his instinctive feel for his pace and shouted “Faster!” at Brasher. Brasher, however, remained composed and maintained his current steady but grueling pace, completing the first two laps in a desirable one minute and fifty-eight seconds. Then Chataway surged forward, leading Bannister at this same punishing rate for another lap and a half. At the beginning of the back straightaway of the track, Bannister bolted past Chataway. Bannister said, “I felt that the moment of a lifetime had come. There was no pain, only a great unity of movement and aim.” Bannister crossed the finish line in 3 minutes 59.4 seconds. The ecstatic crowd erupted the moment the timekeeper announced the word “three.”
- 8 Soon after Bannister’s achievement, four other athletes matched his performance. A new mindset had taken root among runners. Over the years, the record continued to fall. However, the current record, 3 minutes 43.13 seconds, has stood unbroken since 1999. Some question whether this record

represents the limits of human ability. But perhaps there is another Bannister, an athlete who, with willpower and dedication, will accomplish the miraculous.

10. The words “feat,” “humanly impossible,” and “impenetrable barrier” in paragraph 1 affect the tone of the paragraph because they
- E. highlight the idea that only the most skilled runners would be able to run a four-minute mile.
  - F. emphasize the idea that running a mile in less than four minutes was a seemingly unattainable goal.
  - G. convey the competitiveness among elite runners to consistently set and break speed records.
  - H. show the intensity of the training programs athletes endure in order to achieve their goals.
11. How did interval training affect Bannister’s performance?
- A. It helped him learn how to moderate his pace while running.
  - B. It helped him understand the importance of running with a team.
  - C. It helped him improve his pace and stamina while running.
  - D. It helped him decrease his recovery time after an intense run.
12. Which sentence best supports the idea that Bannister needed an alternative to “logical planning” in order to accomplish his goal?
- E. “Bannister’s performance was a disappointment for him and his country, Great Britain.” (paragraph 2)
  - F. “The amateur athlete decided to use intensive interval training to develop endurance and speed.” (paragraph 3)
  - G. “For these workouts, Bannister ran an interval of ten consecutive laps on a quarter-mile track, aiming for sixty seconds each lap.” (paragraph 3)
  - H. “Frustrated by the plateau he had reached, Bannister took a break from training and went mountain climbing for three days.” (paragraph 4)
13. Which sentence from the passage indicates that Bannister nearly made a mistake that would have cost him the world record?
- A. “By early 1954, Bannister had succeeded in lowering his quarter-mile pace to sixty-one seconds, but he had to shave off at least one more second in order to reach his target.” (paragraph 4)
  - B. “When the starting pistol fired, Brasher pounced into the lead, and Bannister followed behind his first rabbit.” (paragraph 6)
  - C. “Propelled by the excitement, Bannister lost his instinctive feel for his pace and shouted ‘Faster!’ at Brasher.” (paragraph 7)
  - D. “At the beginning of the back straightaway of the track, Bannister bolted past Chataway.” (paragraph 7)

14. The phrase “a new mindset had taken root” in paragraph 8 conveys the idea that
- E. runners recognized that running a mile in under four minutes was physically possible.
  - F. breaking the four-minute-mile barrier was no longer considered an impressive feat for elite runners.
  - G. runners understood how hard they would have to train in order to run a mile in under four minutes.
  - H. entering races in an attempt to break the four-minute-mile barrier became commonplace for elite runners.
15. Bannister’s loss in the 1952 Olympics influenced his decision to pursue breaking the four-minute-mile barrier by
- A. allowing him to recognize his weaknesses and improve his running ability.
  - B. prompting him to take a different approach to his regular training.
  - C. motivating him to prove to himself that he could set and achieve a goal.
  - D. giving him the opportunity to reach a goal no runner had ever accomplished.
16. How does the author’s use of chronological structure contribute to the development of ideas in the passage?
- E. It presents the increasing physical effects of Bannister’s intense training methods as he prepared to break the four-minute-mile barrier.
  - F. It shows the increase in Bannister’s confidence in his ability to break the four-minute-mile barrier.
  - G. It emphasizes the key events in Bannister’s life that inspired him to break the four-minute-mile barrier.
  - H. It highlights the progression of Bannister’s training and details about his successful attempt to break the four-minute-mile barrier.
17. Read these sentences from paragraph 7.

**Bannister said, “I felt that the moment of a lifetime had come. There was no pain, only a great unity of movement and aim.”**

The sentences contribute to the development of ideas in the passage by showing that Bannister

- A. knew that he was about to achieve the goal he had worked toward.
- B. was no longer experiencing personal disappointment from his past failure in the Olympics.
- C. felt grateful to his teammates for helping him take the lead.
- D. was satisfied that his training had helped him perfect his running technique.

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## Ode to Fireworks

In autumn my mother drove us to the edge of the field  
where the fair was set up year after year:  
the carousel, the bumper cars, the long, low sheds  
filled with prizewinning animals.

- 5 We—my sister, my cousin, and I—were ready for bed,  
already in our pajamas. This was a treat we waited  
all year for. We waited in the darkness  
for the first low, dull *thwumps*, like someone  
beating an old, filthy rug hung on a wash line.
- 10 Then we counted the seconds between the lightning  
and thunder, as we also used to do, until the sky  
lit up: red, blue, green, gold. In my mind's eye  
I can still see the straggly, ancient oak whose branches  
reached up past the exhibition halls, silhouetted
- 15 against the spectrum of stars that cascaded behind it.

It was one thing to look up into the sky  
and imagine yourself in it or to make out pictures  
among the clouds, which my sister liked to do.

- No, I would tell her, that cloud  
20 does *not* look like an elephant, a hat, an umbrella.  
But it was another thing to see  
the sky at night written upon  
with those jewels. (We lived in the country:  
night was *night*.) All around us, crickets
- 25 stridulated in the stubble of what had been  
somebody's cornfield, their song rising and falling.  
You could smell winter on the air's edge.

Now, in the city, when the sky dips into shadow  
at New Year's or on the Fourth of July, I find myself  
30 craning my neck upward at odd moments.

- The city sky is always lit up. This is where we live now,  
and it is how we live now, awash in light  
of every hue. Everything is a constant celebration:  
picking up washing at the cleaner's or stopping by
- 35 the corner market for a loaf of heavy bread.  
And the music around me is the music of people,  
their voices rising and falling in a hundred languages.  
But beneath the yellowish glow deep in the sky  
of all our city lights pelting out into the universe,
- 40 I remember the feel of the pickup truck bumping  
across the ridged field, as I kept waiting for those  
childhood bursts, watching as they escorted us home.

18. The fireworks in the poem represent the speaker's
- E. wish to return to a simpler way of living.
  - F. bittersweet feelings about leaving the past behind.
  - G. high expectations for everyday life.
  - H. reflections on past interactions with relatives.
19. The comparison in lines 8–9 of the poem is used to convey
- A. the muffled pounding of explosions in the distance.
  - B. the way lightning streaks through the clouds.
  - C. the echoes of thunder on an autumn night.
  - D. the glow of sparks falling from the sky.

20. Read lines 22–23 from the poem.

**the sky at night written upon  
with those jewels.**

What does the word choice in these lines convey about the speaker?

- E. The speaker values material possessions.
  - F. The speaker imagines that the fireworks are magical.
  - G. The speaker believes that the country setting is distinctive.
  - H. The speaker cherishes the memory of seeing fireworks as a child.
21. The use of italics on the word “*night*” in line 24 is most likely intended to emphasize the
- A. sense of mystery in the darkness.
  - B. sense of absolute darkness.
  - C. speaker’s fear of night.
  - D. speaker’s certainty about that night.
22. What is the purpose of the repeated words “rising and falling” in lines 26 and 37?
- E. to create a distinction between solitude and meaningful interaction
  - F. to demonstrate a connection between the speaker’s past and present
  - G. to emphasize the speaker’s attention to the surrounding sounds
  - H. to compare the fireworks to common sights and sounds

23. What impact does the phrase “Everything is a constant celebration” (line 33) have in the poem?
- A. It reveals that the speaker finds the city more pleasurable than the country.
  - B. It suggests that the persistent brightness of the city can be overwhelming to the speaker.
  - C. It implies that what is normal in the city was unusual in the country.
  - D. It emphasizes the hectic pace of daily life in the city.

24. Read lines 41–42 from the poem.

**I kept waiting for those  
childhood bursts, watching as they escorted us home.**

How does this memory affect the speaker?

- E. The speaker believes it is impossible to ever return to a place in the past.
- F. The speaker is still amused by the impatience felt during fireworks displays.
- G. The speaker now regrets abandoning the rural way of life.
- H. The speaker feels a sense of comfort when reflecting on the past.

CONTINUE ON TO THE NEXT PAGE ►

*For centuries, scientists were confounded by an animal that seemed to look and act like a combination of a bird, a reptile, and a mammal. It has a bill like a duck and lays eggs but produces milk for its young. It lives in a burrow, has fur, and can make venom. We now know that this animal is called a duck-billed platypus. A platypus is a monotreme, a type of egg-laying mammal.*

## Excerpt from “Research Riddle Resolved”

- 1 Hundreds of years after the first sightings of the platypus, the animal still captures our imagination anew and irresistibly attracts the attention of science writers everywhere. The May 2008 *Nature* report detailing the DNA insides of the duck-billed platypus invited colorful tales from just about every mainstream media outlet.
- 2 But cuteness and weirdness aside, the platypus research results are a gold mine for medical researchers. The findings cement what may have seemed totally obvious but turned out to be a bit of a scientific surprise: platypus DNA is a patchwork of genes from reptiles, birds, and mammals.

### Evolution Fusion

- 3 In other words, the platypus heritage is laid out in an evolutionary DNA tapestry that marks the time, hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree.
- 4 So what? The platypus is nothing like a human, so what can its DNA tell us about people and the diseases we get?
- 5 Plenty, says an international team of scientists who did this work.
- 6 The platypus genome results are far more than confirmation of a scientific oddity. They provide researchers a window into a time in history when mammals became unique—gaining the ability to bear live young, produce milk for them, and grow a warm, furry coat.
- 7 That’s important because our own, modern-day genomes are still a big mystery and researchers need much more information to be able to translate our genetic language into useful health knowledge.
- 8 One of the ways scientists can decipher meaning from within our 3 billion DNA “letters,” or nucleotides, is to compare human genes with those from animals, to see what has been kept the same and what has evolved to be different. . . .

### Same and Different

- 9 In an approach called comparative genomics, scientists compare the genome sequences of several species: human, mouse, and a wide variety of other organisms from single-celled fungi to elephants and, now, the platypus.
- 10 The goal of this research is to find regions of similarity and difference in order to better understand the structure and function of human genes.
- 11 Comparative genomics is directly related to evolution because all living things share a common ancestor. By using computer tools to examine genes that have been kept the same in many organisms over millions of years, researchers can locate signals that control how genes work. This information may translate into ways to understand, treat, and prevent human diseases. . . .

## Chicken or Egg?

- 12 When researchers analyzed platypus DNA and compared it to that of chickens, snakes, and lizards, the findings traced the evolutionary path from birds and reptiles to mammals. They learned that the platypus lost most of its genetic ability to produce egg yolk—as compared to chicken genes. This suggests its departure from “chicken-ness.”
- 13 But, through evolutionary change, the platypus gained the ability to make milk that is rich in nutrients. Platypuses have genes that make the milk protein casein: just like we do.
- 14 A male platypus can, like its ancestral snake and lizard cousins, produce venom. The platypus ejects this venom through special glands in its back legs. The evolutionary reason for maintaining such molecular weaponry isn’t yet clear, but what is fascinating is that it appears nature mixed and matched together DNA pieces separately to create the venom genes in reptiles and monotremes like the platypus.
- 15 The scientific value of pinning genetics to physiological function—like milk production—is high. Such investigations may help medical researchers understand health issues related to reproduction and lactation. Although lactation is an ancient reproductive trait, mammals—including the platypus—are unique in their ability to produce milk that is extraordinarily nutritious, containing a rich blend of sugars, fats, and proteins.
- 16 More generally, though, studying how nature cuts and pastes gene modules gives scientists an inside scoop on how genetic changes relate to health and disease risk.
- 17 One thing is clear—the stunning blend of reptile, bird, and mammal puts the platypus in a class of its own, and it gives researchers much more: information about how mammals like us came about.
- 18 [Scientists’] genetic sleuthing of platypuses, chimps, fish, sunflowers—you name it—continues to teach scientists how millions of years of evolution progressed. This provides vital information to understanding the role of genes in the health and disease of mammals like us and our pets, and can also help preserve our rich and diverse planet.

From “Research Riddle Resolved”—Public Domain/National Institutes of Health

25. Read this sentence from paragraph 2.

**But cuteness and weirdness aside, the platypus research results are a gold mine for medical researchers.**

The sentence contributes to the overall structure of the excerpt by

- A. shifting the focus of the excerpt from the platypus’s unique appearance to its physiology.
- B. highlighting how the platypus’s unusual appearance has attracted scientists’ attention.
- C. revealing current ideas about the genetic background of the platypus.
- D. introducing the platypus’s scientific significance that the rest of the excerpt develops.

26. The phrase “evolutionary DNA tapestry” in paragraph 3 conveys the idea that the platypus
- E. has a rich and diverse genetic history linked to reptiles, birds, and other mammals.
  - F. was able to develop its mammalian and reptilian traits at different points in time.
  - G. continues to be the best resource for studying the evolution of animal genomes.
  - H. is especially useful to researchers because its genes have never been altered.
27. How does paragraph 8 fit into the overall structure of the excerpt?
- A. It provides a transition from the discussion of the platypus genome to a discussion on comparative genomics.
  - B. It introduces the way that scientists solved the problem of how to study complex human genomes through comparative genomics.
  - C. It contrasts the efforts made to study the different parts of the human genome with the efforts made to study certain animal genomes.
  - D. It elaborates on the idea that deciphering genetic signals is a rigorous research challenge.
28. Which sentence gives the best summary of the section “Same and Different” (paragraphs 9–11)?
- E. The platypus is the most recent of several species whose genomes have been compared with the human genome.
  - F. Comparative genomics is an effective way to examine a variety of different species, from single-celled organisms to large mammals.
  - G. Comparing human genes with the genes of other animals and studying which genes are the same across species yield valuable information that may lead to a greater understanding of human disease.
  - H. Scientists are able to use computers in order to compare and examine evolutionary changes in genes across a number of species, including humans.
29. The details in paragraphs 12–14 about the platypus’s different abilities convey a central idea of the excerpt by
- A. showing that the platypus has a gene that allows it to produce nutrient-rich milk, as humans do.
  - B. proving that the platypus, whose DNA is made up of DNA from several other species, has developed venom to defend itself.
  - C. suggesting that the platypus, while gaining traits in common with mammals and reptiles, has lost some bird-like traits.
  - D. demonstrating that the platypus has a rare evolutionary background that includes bird, reptile, and mammal DNA.

30. The author elaborates on the idea that creating a full analysis of platypus DNA was an important scientific endeavor mainly through
- E. a description of the type of information about human genetics that specialized research can yield.
  - F. a comparison of the platypus with its closest bird and reptile relatives on the evolutionary tree.
  - G. the discussion of how unusual the platypus genome is in the animal kingdom.
  - H. the explanation of how genetics can be aligned to physiological function.
31. How can researching the genomes of other animals inform scientists' understanding of human health and disease?
- A. Tracking how other animals evolved over millions of years helps researchers preserve and sustain nature.
  - B. Finding ways that animal genomes are similar to the human genome helps researchers find signals that control genes.
  - C. Observing that all living things evolved from a common ancestor helps researchers pinpoint certain genetic traits.
  - D. Understanding how other animals are similar to one another helps researchers find new ways to understand the human genome.
32. Which sentence from the excerpt best supports the idea that the same DNA material results in the same traits even in different classes of animals?
- E. "The findings cement what may have seemed totally obvious but turned out to be a bit of a scientific surprise: platypus DNA is a patchwork of genes from reptiles, birds, and mammals." (paragraph 2)
  - F. "In other words, the platypus heritage is laid out in an evolutionary DNA tapestry that marks the time, hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree." (paragraph 3)
  - G. "The platypus is nothing like a human, so what can its DNA tell us about people and the diseases we get?" (paragraph 4)
  - H. "The evolutionary reason for maintaining such molecular weaponry isn't yet clear, but what is fascinating is that it appears nature mixed and matched together DNA pieces separately to create the venom genes in reptiles and monotremes like the platypus." (paragraph 14)

*In 1903 brothers Wilbur and Orville Wright conducted various experiments related to flying machines. These experiments would eventually lead to air travel becoming a reliable form of transportation.*

## Excerpt from “How We Made the First Flight”

by Orville Wright

- <sup>1</sup> During the night of December 16, 1903, a strong cold wind blew from the north. When we arose on the morning of the 17th, the puddles of water, which had been standing about camp since the recent rains, were covered with ice. The wind had a velocity of 10 to 12 meters per second (22 to 27 miles an hour). We thought it would die down before long, and so remained indoors the early part of the morning. But when ten o'clock arrived, and the wind was as brisk as ever, we decided that we had better get the machine out and attempt a flight. We hung out the signal for the men of the Life Saving Station.<sup>1</sup> We thought that by facing the flyer into a strong wind, there ought to be no trouble in launching it from the level ground about camp. We realized the difficulties of flying in so high a wind, but estimated that the added dangers in flight would be partly compensated for by the slower speed in landing.

### Final Preparations

- <sup>2</sup> We laid the track on a smooth stretch of ground about one hundred feet north of the new building. The biting cold wind made work difficult, and we had to warm up frequently in our living room, where we had a good fire in an improvised stove made of a large carbide<sup>2</sup> can. By the time all was ready, J. T. Daniels, W. S. Dough and A. D. Etheridge, members of the Kill Devil<sup>3</sup> Life Saving Station; W. C. Brinkley of Manteo, and Johnny Moore, a boy from Nags Head,<sup>4</sup> had arrived.
- <sup>3</sup> We had a “Richard” hand anemometer with which we measured the velocity of the wind. Measurements made just before starting the first flight showed velocities of 11 to 12 meters per second, or 24 to 27 miles per hour. . . .

### Audacity—and Calculation

- <sup>4</sup> Wilbur having used his turn in the unsuccessful attempt on the 14th, the right to the first trial now belonged to me. After running the motor a few minutes to heat it up, I released the wire that held the machine to the track, and the machine started forward in the wind. Wilbur ran at the side of the machine, holding the wing to balance it on the track. Unlike the start on the 14th, made in a calm, the machine, facing a 27-mile wind, started very slowly. Wilbur was able to stay with it till it lifted from the track after a forty-foot run. One of the Life Saving men snapped the camera for us, taking a picture just as the machine had reached the end of the track and had risen to a height of about two feet. The slow forward speed of the machine over the ground is clearly shown in the picture by Wilbur's attitude. He stayed along beside the machine without any effort.

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<sup>1</sup>**Life Saving Station:** one of the rescue stations along the Atlantic coastline that provided assistance to mariners in distress

<sup>2</sup>**carbide:** a very hard material composed of carbon and other heavy metals

<sup>3</sup>**Kill Devil:** the town of Kill Devil Hills in eastern North Carolina

<sup>4</sup>**Nags Head:** a town in eastern North Carolina

## Flight

- 5 The course of the flight up and down was exceedingly erratic, partly due to the irregularity of the air, and partly to lack of experience in handling this machine. The control of the front rudder was difficult on account of its being balanced too near the center. This gave it a tendency to turn itself when started; so that it turned too far on one side and then too far on the other. As a result the machine would rise suddenly to about ten feet, and then as suddenly dart for the ground. A sudden dart when a little over a hundred feet from the end of the track, or a little over 120 feet from the point at which it rose into the air, ended the flight. As the velocity of the wind was over 35 feet per second and the speed of the machine over the ground against this wind ten feet per second, the speed of the machine relative to the air was over 45 feet per second, and the length of the flight was equivalent to a flight of 540 feet made in calm air. This flight lasted only 12 seconds, but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed and had finally landed at a point as high as that from which it started.

From "How We Made the First Flight" by Orville Wright—Public Domain/Federal Aviation Administration

33. How does paragraph 1 introduce the idea that the Wright brothers knew that their flight attempt was risky?
- A. through the mention of a signal to notify lifesaving experts that the flight attempt was about to begin
  - B. by providing specific details about the speed of the wind and the Wright brothers' response to the windy conditions
  - C. by suggesting that a slower landing would be necessary at the end of the flight in order to maintain safety
  - D. through the indication that the Wright brothers waited indoors for most of the morning because of the poor weather
34. Read this sentence from paragraph 4.

**Wilbur having used his turn in the unsuccessful attempt on the 14th, the right to the first trial now belonged to me.**

The sentence contributes to the development of ideas in the excerpt by

- E. demonstrating the challenge of the extreme winter conditions during the flight.
- F. revealing how many tries it took for Wilbur Wright to finally get the machine to take flight.
- G. demonstrating that both Orville and Wilbur Wright were eager to pilot what could potentially be the first flight.
- H. suggesting a sense that both brothers felt confident they would soon succeed in completing the first flight.

35. Read this sentence from paragraph 5.

**This flight lasted only 12 seconds, but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed and had finally landed at a point as high as that from which it started.**

The words “only,” “nevertheless,” and “finally” most clearly convey the idea that

- A. even a flight of such minor duration had taken a long time to achieve.
- B. the short flight gave the Wright brothers hope for longer ones in the future.
- C. the flight proved that the machine was, at last, capable of becoming airborne.
- D. although it was brief, the flight was a remarkable accomplishment.

36. Read this sentence from paragraph 5.

**As the velocity of the wind was over 35 feet per second and the speed of the machine over the ground against this wind ten feet per second, the speed of the machine relative to the air was over 45 feet per second, and the length of the flight was equivalent to a flight of 540 feet made in calm air.**

How does the sentence help convey Orville Wright’s perspective about this first flight?

- E. It provides evidence that he maintained a scientific approach when attempting flight.
- F. It emphasizes that he believed the flight was successful despite its short distance.
- G. It provides a comparison between flight distances under calm and high wind conditions.
- H. It highlights the importance of such calculations in the success of future flights.

37. How do the details in paragraph 5 about the uneven nature of the flight convey a central idea of the excerpt?

- A. by explaining how the flawed design of the machine caused it to turn unpredictably in the air and brought the first flight by a person to an abrupt end
- B. by indicating that the difficulty in controlling the flight was caused by the rudimentary instruments of the machine and the inexperience of the pilot
- C. by explaining how the pilot and the plane overcame adverse conditions in order to complete the first piloted flight
- D. by indicating that the gradual change in wind velocity created an extreme environment in which to maneuver the plane and maintain its flight

- 38.** Which sentence from the excerpt best supports the idea that the Wright brothers had to adapt their flight plans to accommodate the weather conditions?
- E.** “When we arose on the morning of the 17th, the puddles of water, which had been standing about camp since the recent rains, were covered with ice.” (paragraph 1)
  - F.** “We realized the difficulties of flying in so high a wind, but estimated that the added dangers in flight would be partly compensated for by the slower speed in landing.” (paragraph 1)
  - G.** “After running the motor a few minutes to heat it up, I released the wire that held the machine to the track, and the machine started forward in the wind.” (paragraph 4)
  - H.** “The course of the flight up and down was exceedingly erratic, partly due to the irregularity of the air, and partly to lack of experience in handling this machine.” (paragraph 5)
- 39.** The use of chronological structure contributes to the development of ideas in the excerpt by
- A.** outlining the actions that the Wright brothers took to prepare for and successfully complete the first flight.
  - B.** identifying the primary factors that allowed the Wright brothers to overcome obstacles and achieve the first flight.
  - C.** showing how the Wright brothers applied lessons learned from their previous flight attempts to accomplish the first flight.
  - D.** demonstrating how the Wright brothers analyzed the impact of wind velocity to identify the ideal conditions for the first flight.

## Excerpt from *In Search of the Unknown*

by Robert W. Chambers

- 1 It was at that time the policy of the trustees and officers of the Zoological Gardens neither to employ collectors nor to send out expeditions in search of specimens. The society decided to depend upon voluntary contributions, and I was always busy, part of the day, in dictating answers to correspondents who wrote offering their services as hunters of big game, collectors of all sorts of fauna, trappers, snarers, and also to those who offered specimens for sale, usually at exorbitant rates.
- 2 To the proprietors of . . . mangy lynxes, moth-eaten coyotes, and dancing bears I returned courteous but uncompromising refusals—of course, first submitting all such letters, together with my replies, to Professor Farrago.
- 3 One day towards the end of May, however, just as I was leaving Bronx Park to return to town, Professor Lesard, of the reptilian department, called out to me that Professor Farrago wanted to see me a moment; so I . . . retraced my steps to the temporary, wooden building occupied by Professor Farrago, general superintendent of the Zoological Gardens. The professor, who was sitting at his desk before a pile of letters and replies submitted for approval by me, pushed his glasses down and looked over them at me with a whimsical smile that suggested amusement, impatience, annoyance, and perhaps a faint trace of apology.
- 4 “Now, here’s a letter,” he said, with a deliberate gesture towards a sheet of paper impaled on a file—“a letter that I suppose you remember.” He disengaged the sheet of paper and handed it to me.
- 5 “Oh yes,” I replied, with a shrug; “of course the man is mistaken—or—”
- 6 “Or what?” demanded Professor Farrago, tranquilly, wiping his glasses.
- 7 “—Or a liar,” I replied.
- 8 After a silence he leaned back in his chair and bade me read the letter to him again, and I did so with a contemptuous tolerance for the writer, who must have been either a very innocent victim or a very stupid swindler. I said as much to Professor Farrago, but, to my surprise, he appeared to waver.
- 9 “I suppose,” he said, with his near-sighted, embarrassed smile, “that nine hundred and ninety-nine men in a thousand would throw that letter aside and condemn the writer as a liar or a fool?”
- 10 “In my opinion,” said I, “he’s one or the other.”
- 11 “He isn’t—in mine,” said the professor, placidly.
- 12 “What!” I exclaimed. “Here is a man living all alone on a strip of rock and sand between the wilderness and the sea, who wants you to send somebody to take charge of a bird that doesn’t exist!”
- 13 “How do you know,” asked Professor Farrago, “that the bird in question does not exist?”
- 14 “It is generally accepted,” I replied, sarcastically, “that the great auk has been extinct for years. Therefore I may be pardoned for doubting that our correspondent possesses a pair of them alive.”

15 “Oh, you young fellows,” said the professor, smiling wearily, “you embark on a theory for destinations that don’t exist.”

16 He leaned back in his chair, his amused eyes searching space for the imagery that made him smile.

17 “Like swimming squirrels, you navigate with the help of Heaven and a stiff breeze, but you never land where you hope to—do you?”

18 Rather red in the face, I said: “Don’t you believe the great auk to be extinct?”

19 “Audubon<sup>1</sup> saw the great auk.”

20 “Who has seen a single specimen since?”

21 “Nobody—except our correspondent here,” he replied, laughing.

22 I laughed, too, considering the interview at an end, but the professor went on, coolly:

23 “Whatever it is that our correspondent has—and I am daring to believe that it *is* the great auk itself—I want you to secure it for the society.”

24 When my astonishment subsided my first conscious sentiment was one of pity. Clearly, Professor Farrago was on the verge of dotage<sup>2</sup>—ah, what a loss to the world!

25 I believe now that Professor Farrago perfectly interpreted my thoughts, but he betrayed neither resentment nor impatience. I drew a chair up beside his desk—there was nothing to do but to obey, and this fool’s errand was none of my conceiving.

26 Together we made out a list of articles necessary for me and itemized the expenses I might incur, and I set a date for my return, allowing no margin for a successful termination to the expedition.

27 “Never mind that,” said the professor. “What I want you to do is to get those birds here safely. Now, how many men will you take?”

28 “None,” I replied, bluntly; “it’s a useless expense, unless there is something to bring back. If there is I’ll wire you, you may be sure.”

29 “Very well,” said Professor Farrago, good-humoredly, “you shall have all the assistance you may require. Can you leave to-night?”

30 The old gentleman was certainly prompt. I nodded, half-sulkily, aware of his amusement.

31 “So,” I said, picking up my hat, “I am to start north to find a place called Black Harbor, where there is a man named Halyard who possesses, among other household utensils, two extinct great auks—”

32 We were both laughing by this time. I asked him why on earth he credited the assertion of a man he had never before heard of.

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<sup>1</sup>**Audubon:** John James Audubon, an ornithologist and artist who created scientific illustrations of birds

<sup>2</sup>**dotage:** a loss of reasoning brought about by old age

- 33 “I suppose,” he replied, with the same half-apologetic, half-humorous smile, “it is instinct. I feel, somehow, that this man Halyard *has* got an auk—perhaps two. I can’t get away from the idea that we are on the eve of acquiring the rarest of living creatures. It’s odd for a scientist to talk as I do; doubtless you’re shocked—admit it, now!”
- 34 But I was not shocked; on the contrary, I was conscious that the same strange hope that Professor Farrago cherished was beginning, in spite of me, to stir my pulses, too.
- 35 “If he has—” I began, then stopped.
- 36 The professor and I looked hard at each other in silence.
- 37 “Go on,” he said, encouragingly.
- 38 But I had nothing more to say, for the prospect of beholding with my own eyes a living specimen of the great auk produced a series of conflicting emotions within me which rendered speech profanely superfluous.

From *IN SEARCH OF THE UNKNOWN* by Robert W. Chambers—Public Domain

40. Read paragraph 2 from the excerpt.

**To the proprietors of . . . mangy lynxes, moth-eaten coyotes, and dancing bears I returned courteous but uncompromising refusals—of course, first submitting all such letters, together with my replies, to Professor Farrago.**

This paragraph helps develop the plot by establishing that the narrator

- E. thinks that writing refusal letters for the animals offered to the zoological society is not necessary.
- F. attempts to predict what the professor would say in the refusal letters.
- G. believes that many of the animals offered are not acceptable for the zoological society.
- H. resents the professor’s insistence on reviewing the refusal letters.

41. Read this sentence from paragraph 3.

**The professor, who was sitting at his desk before a pile of letters and replies submitted for approval by me, pushed his glasses down and looked over them at me with a whimsical smile that suggested amusement, impatience, annoyance, and perhaps a faint trace of apology.**

What does the phrase “a faint trace of apology” convey about the professor?

- A. It indicates that the professor feels bad that he has to call the narrator to his office after work.
  - B. It shows that the professor is hesitant to share his opinions with the narrator.
  - C. It implies that the professor is uncomfortable criticizing the narrator’s work.
  - D. It suggests that the professor knows that the conversation will be frustrating for the narrator.
42. How does the exchange between the professor and the narrator in paragraphs 8–11 contribute to the development of the excerpt?
- E. It establishes the conflict between the professor and the narrator concerning the validity of the letter.
  - F. It suggests a theme of collaboration because the narrator and the professor regularly work together.
  - G. It reveals the characters’ traits by contrasting the narrator’s distrust of the content of the letter with how easily the professor is deceived by what he reads.
  - H. It hints that the resolution will involve the narrator accepting the professor’s opinion about the content of the letter.
43. The professor’s observations in paragraphs 15–17 create tension in the excerpt by causing the narrator to feel
- A. flustered by the professor’s criticism of his logic.
  - B. annoyed by the professor’s sarcasm about his inexperience.
  - C. confused by the professor’s lack of respect for his opinion.
  - D. frustrated by the professor’s lack of interest in his theory.
44. How does the interaction between the narrator and the professor in paragraphs 26–28 contribute to the development of the theme?
- E. It illustrates the professor’s patience as the narrator argues against making the expedition.
  - F. It reveals the narrator’s frustration with his limited role in making decisions for the zoological society.
  - G. It emphasizes the professor’s desire to acquire new specimens for the zoological society at any cost.
  - H. It shows the narrator’s acceptance of his assignment despite his personal objections.

45. How does the author develop the contrast between the narrator’s point of view and the professor’s point of view?
- A. by providing both the narrator’s and professor’s thoughts on how age and experience influence each other’s reasoning
  - B. by using the conversation between the narrator and the professor to emphasize their reactions to the letter
  - C. by describing the professor’s persistent efforts to change the narrator’s mind about the letter
  - D. by including dialogue that explains why the professor is the supervisor and the narrator is his subordinate
46. How does paragraph 34 help develop the plot of the excerpt?
- E. It shows that the narrator is beginning to consider the possibility of finding the great auks.
  - F. It demonstrates that the narrator is struggling to understand why the professor thinks the great auks exist.
  - G. It establishes that the narrator is willing to let the professor overrule him about the great auks.
  - H. It emphasizes that the narrator feels a sense of urgency to begin an expedition to locate the great auks.
47. Which sentence best demonstrates the professional relationship between the narrator and the professor?
- A. “I said as much to Professor Farrago, but, to my surprise, he appeared to waver.” (paragraph 8)
  - B. “Clearly, Professor Farrago was on the verge of dotage—ah, what a loss to the world!” (paragraph 24)
  - C. “I drew a chair up beside his desk—there was nothing to do but to obey, and this fool’s errand was none of my conceiving.” (paragraph 25)
  - D. “‘Very well,’ said Professor Farrago, good-humoredly, ‘you shall have all the assistance you may require.’” (paragraph 29)
48. Which sentence from the excerpt best explains why the professor is eager to send the narrator on an expedition?
- E. “‘Whatever it is that our correspondent has—and I am daring to believe that it *is* the great auk itself—I want you to secure it for the society.’” (paragraph 23)
  - F. “‘What I want you to do is to get those birds here safely.’” (paragraph 27)
  - G. “‘I suppose,’ he replied, with the same half-apologetic, half-humorous smile, ‘it is instinct.’” (paragraph 33)
  - H. “‘I can’t get away from the idea that we are on the eve of acquiring the rarest of living creatures.’” (paragraph 33)

CONTINUE ON TO THE NEXT PAGE ►

## Is It Time for Term Limits?

- 1 In 1799, when George Washington’s supporters asked him to consider serving a third term as president of the United States, he declared, “Prudence on my part must arrest any attempt at the well meant, but mistaken views of my friends, to introduce me again into the Chair of Government.” Even though some of his contemporaries advocated for a lifetime appointment for presidents, Washington thought that government officials should not seek to gain unfair power. Only one president has been elected to four terms: Franklin Delano Roosevelt. He was elected to a third term in 1940 and a fourth in 1944 due to the challenges of the Great Depression and World War II. This departure from the rule worried some, and on March 21, 1947, Congress passed the Twenty-Second Amendment to the Constitution, legally limiting the office of president to two four-year terms.
- 2 Presidential terms are clearly limited in the Constitution, but for people serving in Congress, this is not the case. Currently, members of the House of Representatives, who serve two-year terms, and Senators, who serve six-year terms, can run for reelection an unlimited number of times. Because of the possibility of unlimited reelections, many people are beginning to believe that limiting congressional terms would benefit our government. Modern surveys conducted by multiple firms consistently show that American citizens of a variety of backgrounds and political leanings approve of the idea of setting term limits for members of Congress.
- 3 American citizens are not the only supporters of term limits for Congress. Even some members of Congress themselves have spoken out in support of this change. Former Senator Joe Lieberman, upon his retirement, suggested that Congress “might be healthier and less partisan<sup>1</sup> and less rigid if it turned over more often, and term limits are one way to do that.” Michael Olson and Jon Rogowski state in their article “Legislative Term Limits and Polarization” that “proponents of term limits argue that limiting the number of terms legislators can serve in office would reduce the level of partisan conflict, encourage compromise and cooperation, and improve the quality of representation.”
- 4 Experienced politicians certainly can build on years of knowledge, but term limit supporters point out that career politicians may base key decisions on their own personal long-term goals. In the article “Term Limitations and the Myth of the Citizen-Legislator,” author Elizabeth Garrett states that “under term limits, a careerist needs to move up the political opportunity structure to remain in elected office, but the probability of unimpeded upward movement decreases as the number of available positions that are perceived as advancements decline.”
- 5 While challenging the career politician’s path is seen as a benefit to term limit supporters, there is a possibility that a Congress mostly composed of newcomers could severely affect policy making. Experienced politicians have a deep knowledge of congressional processes, and in addition, politicians who have served together for extended periods have a chance to develop trusting relationships, even across party lines. Molly Reynolds, a congressional expert for the Brookings Institution, says that members who are restricted by term limits “have neither the time nor the incentive to develop the relevant expertise they need to be good at their jobs. If members don’t have that expertise themselves, they’re more likely to rely on outsiders, including lobbyists, to replace that expertise.”
- 6 In fact, first-time politicians’ susceptibilities to lobbyists, or groups seeking to influence legislators, have actually been put to the test on the state level. In 2006, the National Conference of State Legislators Study revealed that term limits may increase the influence of lobbyists. In the 1990s, more

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<sup>1</sup>**partisan:** showing a strong and sometimes blind adherence to a particular political party

than twenty states implemented term limits within their state governments. The inexperienced state lawmakers began depending on special-interest groups for their expertise on issues. In the end, many people believed that implementing term limits in the state legislature caused problems, and since then, six states have repealed the limits.

- 7 Additionally, those who oppose term limits maintain that the turnover rate in Congress is sufficient. Thomas E. Mann, Senior Fellow in governance studies at the Brookings Institution, notes that every decade, new members replace at least half the members of the House and the Senate, due to retirement or elections. Still, the average length of time in office has mushroomed. For example, the 65th Congress (1917–1919) had an average service time of 5.3 years for members of the House of Representatives and 5.7 years for Senate members. The 114th Congress (2015–2017) had an average of 8.8 years for members of the House and 9.7 years for senators.
- 8 Should Congress pass a constitutional amendment to institute congressional term limits? Perhaps one day people will have a chance to vote on the issue.

**PERCENTAGE OF REPRESENTATIVES AND SENATORS REELECTED**

<b>House of Representatives Total seats: 435</b>	<b>Year</b>	<b>Percentage Reelected</b>
	1950	83.2
	1978	82.3
	1998	90.8
	2016	87.4

<b>Senate Total seats: 100</b>	<b>Year</b>	<b>Percentage Reelected</b>
	1950	68.8
	1978	60.0
	1998	89.7
	2016	93.1

49. What is the best summary of the discussion of congressional term policy outlined in paragraph 2?
- A. While all members of Congress can be reelected an unlimited number of times, members of the House of Representatives and of the Senate serve different term lengths; this inequity has become troubling to many American citizens in recent years.
  - B. The discrepancy between the president having term limits and members of Congress having unlimited terms has come to seem like a governmental flaw to many American citizens, and this flaw could be remedied by imposing congressional term limits.
  - C. Support for congressional term limits is increasing, as shown by recent surveys indicating that American citizens of different backgrounds and political beliefs are beginning to favor implementation of term limits for members of Congress.
  - D. While the Constitution sets a term limit for the office of president, no such limit exists for members of Congress; however, recent surveys show that many American citizens are now in favor of term limits for members of Congress.
50. Which sentence from the passage supports the idea that congressional term limits would “benefit our government” (paragraph 2)?
- E. “Currently, members of the House of Representatives, who serve two-year terms, and Senators, who serve six-year terms, can run for reelection an unlimited number of times.” (paragraph 2)
  - F. “Modern surveys conducted by multiple firms consistently show that American citizens of a variety of backgrounds and political leanings approve of the idea of setting term limits for members of Congress.” (paragraph 2)
  - G. “Former Senator Joe Lieberman, upon his retirement, suggested that Congress ‘might be healthier and less partisan and less rigid if it turned over more often, and term limits are one way to do that.’ ” (paragraph 3)
  - H. “Thomas E. Mann, Senior Fellow in governance studies at the Brookings Institution, notes that every decade, new members replace at least half the members of the House and the Senate, due to retirement or elections.” (paragraph 7)
51. The quotations in paragraph 3 convey a central idea of the passage by
- A. emphasizing some of the possible effects term limits would have on how Congress functions.
  - B. showing that both politicians and law experts have strong opinions about congressional term limits.
  - C. suggesting that citizens defer to career politicians and law experts on issues such as congressional term limits.
  - D. implying that term limits would affect the ways that members of Congress campaign and vote.

52. Read this sentence from paragraph 5.

**While challenging the career politician’s path is seen as a benefit to term limit supporters, there is a possibility that a Congress mostly composed of newcomers could severely affect policy making.**

Which statement best describes how the sentence fits into the overall structure of the passage?

- E. It provides evidence for the idea that term limits are controversial.
  - F. It summarizes the consequences of having term limits.
  - G. It begins to explore the effects of instituting term limits.
  - H. It shifts from the arguments for to the arguments against term limits.
53. According to paragraph 5, serving more terms improves politicians’ effectiveness by
- A. motivating them to learn the congressional processes necessary to create legislation.
  - B. encouraging them to collaborate with politicians of the opposing party in order to pass legislation.
  - C. allowing them to gain expertise and develop strong political relationships.
  - D. enabling them to create new policies while fostering their own careers.
54. According to the passage, why would setting term limits for members of Congress potentially increase the influence of special-interest groups?
- E. Term limits would lead to a greater number of new representatives who rely on guidance and support from special-interest groups early in their terms.
  - F. Term limits would create a situation in which special-interest groups have to work more closely with the new representatives who replace experienced representatives.
  - G. Term limits would force experienced representatives out of their seats and bring in new representatives who focus on the agendas of special-interest groups.
  - H. Term limits would result in both new and experienced representatives looking to special-interest groups in order to influence decisions made in legislature.
55. The author of the passage develops the idea that congressional term limits might have negative effects mainly by
- A. describing the amount of time it takes for new representatives to build connections with experienced representatives.
  - B. explaining why members of Congress need experience in order to govern well.
  - C. illustrating the various ways lobbyists seek to influence the decisions of new members of Congress.
  - D. revealing the statistics on the turnover rates for representatives.

- 56.** With which statement would the author of the passage most likely agree?
- E.** The expertise of lawmakers should outweigh other considerations when it comes to deciding about term limits.
  - F.** The decision to institute term limits for Congress is the most pressing issue facing American voters today.
  - G.** There are compelling reasons both for and against setting term limits for Congress.
  - H.** Special-interest groups are likely to have a huge influence on whether term limits are set.
- 57.** The tables at the end of the passage contribute to the development of ideas in paragraph 7 by
- A.** highlighting the idea that the number of members of Congress who are reelected in each election has increased substantially since 1950.
  - B.** demonstrating that the number of times members of Congress are reelected throughout their careers has shifted since 1950.
  - C.** showing that the reelection rate in the Senate differs from the reelection rate in the House.
  - D.** emphasizing the fact that the Senate has fewer seats but a greater reelection rate than the House.

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# PART 2 — MATHEMATICS

57 QUESTIONS

## IMPORTANT NOTES

- (1) Formulas and definitions of mathematical terms and symbols are **not** provided.
  - (2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be determined from the information given.
  - (3) Assume that a diagram is in one plane unless the question specifically states that it is not.
  - (4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, lines on a graph that appear to be parallel can be assumed to be parallel. This is also true for concurrent lines, straight lines, collinear points, right angles, etc.
  - (5) Reduce (simplify) all fractions to lowest terms.
- 

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# GRID-IN QUESTIONS

## QUESTIONS 58–62

**DIRECTIONS:** Solve each question. On the answer sheet, write your answer in the boxes at the top of the grid. Start on the left side of each grid. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above. **DO NOT FILL IN A CIRCLE UNDER AN UNUSED BOX. DO NOT LEAVE A BOX BLANK IN THE MIDDLE OF AN ANSWER.**

58. Ms. Li opened a retirement account with a deposit of \$2,500. This account earns 4% simple interest annually. How many years will it take her to earn \$500 on her \$2,500 deposit?

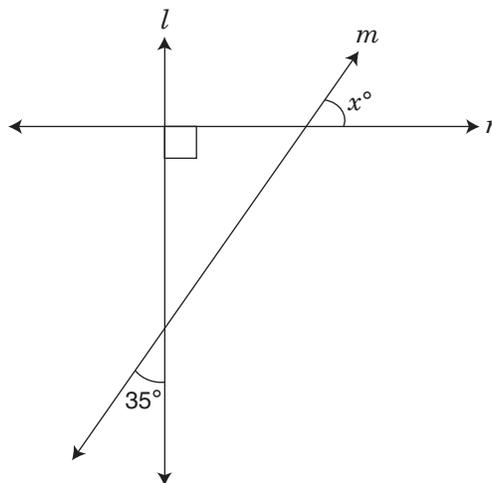
59.  $6 - 9 \div |-3| + (-2)^3 \times 1\frac{1}{2}$

What is the value of the expression shown above?

60. Solve for  $x$ :

$$7x + 3 - 2(2x + 1) = 13$$

- 61.



In the figure above, line  $l$  is perpendicular to line  $n$ . What is the value of  $x$ ?

62. The mean value of 8 numbers is 17. Three of these numbers (9, 11, and 20) are discarded. What is the mean of the 5 remaining numbers?

# MULTIPLE CHOICE QUESTIONS

## QUESTIONS 63–114

**DIRECTIONS:** Solve each question. Select the best answer from the choices given. Mark the letter of your answer on the answer sheet. When you are solving questions, you can write in the test booklet or on the scrap paper given to you.

63.  $3^4 + 7^4 =$

- A. 40
- B. 370
- C. 2,482
- D. 10,000

64. In one week,  $1\frac{3}{4}$  inches of rain fell on Monday,  $2\frac{2}{3}$  inches fell on Tuesday, and  $\frac{7}{8}$  inch fell on Wednesday. How many inches of rain fell during those three days?

- E.  $5\frac{7}{24}$
- F.  $5\frac{1}{24}$
- G.  $3\frac{4}{5}$
- H.  $3\frac{1}{2}$

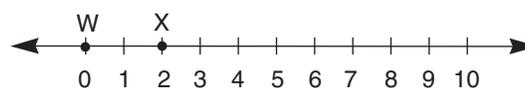
65. An alarm bell will ring when the pressurized gas in a cylinder reaches an internal pressure that is 215% of the maximum allowable pressure. If the maximum allowable pressure is 220 pounds per square inch, at what pressure, in pounds per square inch, will the alarm bell ring?

- A. 235
- B. 435
- C. 473
- D. 583

66. A revolving sign makes 1 complete revolution every 90 minutes. If the sign starts moving at 2:30 p.m., at what time will the sign complete 8 revolutions?

- E. 1:00 a.m.
- F. 2:30 a.m.
- G. 4:00 p.m.
- H. 12:00 midnight

67.



Points Y and Z are not shown on the number line above. If X is the midpoint of  $\overline{WY}$ , and Y is the midpoint of  $\overline{WZ}$ , where on the number line would point Z be located?

- A. 2
- B. 4
- C. 6
- D. 8

68.

$$\frac{81}{10} = \frac{9}{n}$$

What value of  $n$  makes the equation above true?

E. 1

F.  $1\frac{1}{9}$

G. 5

H.  $10\frac{1}{9}$

69. If  $n$  is an integer and  $3n + 3$  is an even number, which expression must also represent an even number?

A.  $5n + 1$

B.  $4n + 5$

C.  $2n + 3$

D.  $n + 2$

70. The product of two positive integers is 65. Which number could be the sum of the two integers?

E. 5

F. 18

G. 24

H. 52

71. If  $n$  is an odd integer that is less than  $-3.25$ , what is the **greatest** possible value of  $n$ ?

A.  $-1$

B.  $-2$

C.  $-3$

D.  $-5$

72. Mikah's history assignment is to read 420 pages. He planned to do the assignment in 6 hours. He read the first 160 pages in 2 hours. What is the mean number of pages he must read per hour during the next 4 hours in order to complete the assignment according to plan?

E. 60

F. 65

G. 70

H. 75

73. Between which two consecutive integers is the fraction  $\frac{29}{7}$ ?

A. 2 and 3

B. 3 and 4

C. 4 and 5

D. 5 and 6

74.

## DOWNTOWN BUILDING CONDITIONS

Condition	Number of Buildings	Percentage of Total
Excellent	78	33.6%
Good	69	29.7%
Fair	70	30.2%
Poor	11	6.7%
Dilapidated	4	1.7%
<b>Total</b>	<b>232</b>	<b>99.9%</b>

One number in the percentage column is incorrect. Which change needs to be made?

- E. Change "Excellent" to 36.6%.
- F. Change "Good" to 32.7%.
- G. Change "Fair" to 33.2%.
- H. Change "Poor" to 4.7%.

75. Joseph is 5 feet 9 inches tall, and Roberto is 6 feet 4.5 inches tall. What is the difference in height, in inches, between Roberto and Joseph?

- A. 4.5
- B. 5.5
- C. 6.5
- D. 7.5

76.

$$x:35 = 20:28$$

For what value of  $x$  is the proportion shown above true?

- E. 27
- F. 25
- G. 16
- H. 13

77.

$$\frac{3^2 + (-8)^2 + 2^2}{(3 - 8 + 2)^2} =$$

- A. -60
- B.  $-\frac{17}{3}$
- C.  $\frac{77}{9}$
- D. 68

78. Anya contributed \$1,200 toward the purchase of a \$2,000 computer. Her brother contributed \$240 toward the same computer. Her parents provided the rest of the money for the computer. What percentage of the total cost of the computer did Anya's parents pay?

- E. 24%
- F. 28%
- G. 32%
- H. 36%

79. The numbers  $m$ ,  $n$ ,  $p$ , and  $q$  are different, and each is equal to one of the numbers 1, 2, 3, 6, or 12. If  $2m = 6q = \frac{1}{2}n = p$ , what is the value of  $p$ ?

- A. 2
- B. 3
- C. 6
- D. 12

80.  $\{0.1, 0.01, 0.001, 0.0001, 0.00001\}$

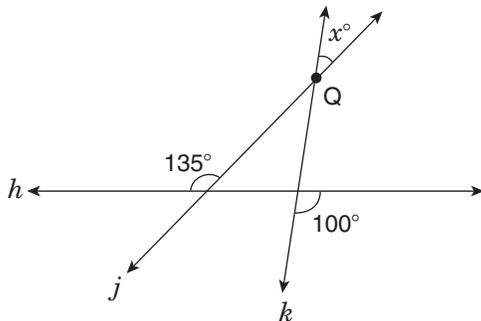
If a person chooses a number at random from the set above, what is the probability that the number is less than 0.005?

- E.  $\frac{1}{5}$
- F.  $\frac{2}{5}$
- G.  $\frac{3}{5}$
- H.  $\frac{2}{3}$

81. Lemont answered 6 out of 40 questions on a test incorrectly. What percentage of the questions did he answer correctly?

- A. 85%
- B. 67%
- C. 34%
- D. 15%

- 82.



Lines  $j$  and  $k$  intersect at point  $Q$ , and  $h$  is a straight line. What is the value of  $x$ ?

- E. 55
- F. 45
- G. 35
- H. 30

83. Which statement **must** be true if  $x$  is a whole number greater than or equal to 1?

- A.  $\frac{1}{x+1} > \frac{1}{x+2}$
- B.  $\frac{1}{x+1} < \frac{1}{x+2}$
- C.  $\frac{1}{x+1} - \frac{1}{x+2} > 1$
- D.  $\frac{1}{x+1} - \frac{1}{x+2} > \frac{1}{x}$

84. A basket contains red balls, green balls, and white balls. There are 12 red balls in the basket. The probability of randomly choosing a red ball is 1 in 3. If the probability of randomly choosing a green ball is 1 in 4, how many green balls are in the basket?

- E. 3
- F. 8
- G. 9
- H. 16

85. It took Lars 2 hours to ride his bicycle 48 kilometers. What was his average speed in **miles per hour**? (Use the approximation 1 mile = 1.6 kilometers.)

- A. 1.5
- B. 15.0
- C. 30.0
- D. 38.4

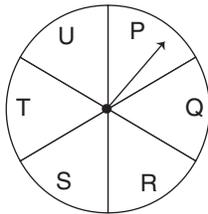
86. Integer  $x$  is evenly divisible by 3. Which expression below is also evenly divisible by 3?

- E.  $2x + 1$
- F.  $3x - 5$
- G.  $4x - 1$
- H.  $4x + 6$

87. Lamel has a jar containing 6 red chips, 10 blue chips, and 4 yellow chips. If he removes one chip at random, what is the probability that it will **not** be red?

- A.  $\frac{4}{5}$
- B.  $\frac{7}{10}$
- C.  $\frac{3}{10}$
- D.  $\frac{1}{5}$

88.



The arrow starts on Space P and moves clockwise around the circle. It moves through one space each minute. What space will the arrow point to in 100 minutes?

- E. R
- F. S
- G. T
- H. U

89. Mei-Ling is one of 6 members of a committee. If 2 members of that committee are selected to go to a conference, how many of the possible pairs of members would include Mei-Ling?

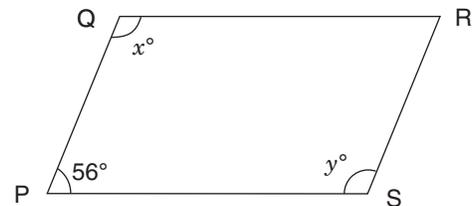
- A. 5
- B. 6
- C. 10
- D. 12

90. If  $m = 5$  and  $t = -1$ , what is the value of

$$\frac{6 - 8(2 - t)}{2m + 4(3 - m)}$$

- E. -9
- F. -1
- G. 1
- H. 9

91.



In the parallelogram above, what is the value of  $x + y$ ?

- A. 112
- B. 124
- C. 148
- D. 248

92.



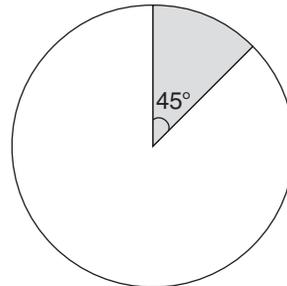
On the number line above, point L (not shown) is located on line segment JK so that  $JL = \frac{2}{3}LK$ . What is the position of point L?

- E. -2
- F. 0
- G. 2
- H. 4

93. Josef and Mai divided some stamps between themselves. Josef got 60% of the stamps. If Josef received 500 more stamps than Mai, how many stamps did Josef receive?

- A. 300
- B. 800
- C. 1,500
- D. 2,500

94.



The shaded sector of the circle shown above has an area of  $18\pi$  square feet. What is the **circumference** of the circle?

- E.  $144\pi$  ft
- F.  $24\pi$  ft
- G.  $18\pi$  ft
- H.  $9\pi$  ft

95. Which graph represents the solution to  $-3x - 7 > -4$ ?

- A.
- B.
- C.
- D.

96. A scientist mixed three chemicals, R, S, and T, in a glass container. The amount of R is 3 times the amount of S, and the amount of T is  $\frac{1}{6}$  the amount of S. What is the ratio of the amount of R to the amount of T?
- E. 1:18  
F. 2:1  
G. 3:1  
H. 18:1

97. Ken has  $k$  video games, and Jeff has  $j$  video games. If Ken gives 6 video games to Jeff, Ken will have twice as many video games as Jeff. Which equation shows the relationship between  $k$  and  $j$ ?
- A.  $k - 6 = 2(j + 6)$   
B.  $k - 6 = 2j + 6$   
C.  $2(k - 6) = j$   
D.  $2(k - 6) = j + 6$

98. Yesterday Sarah read 15% of her entire book. Today she read another 17% of the entire book. In lowest terms, what fraction of the book is left for her to read?
- E.  $\frac{7}{25}$   
F.  $\frac{3}{10}$   
G.  $\frac{17}{25}$   
H.  $\frac{7}{10}$

99.  $\{1, 2, 3, 4, 5, \dots, 198, 199, 200\}$

How many members of the set shown above are multiples of 6 but **not** multiples of 9?

- A. 11  
B. 13  
C. 20  
D. 22

100. Kim jogs 8 kilometers in 1 hour 40 minutes. At that rate, how many **meters** does she jog per minute?

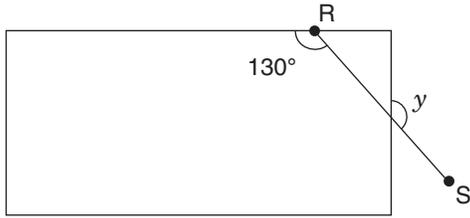
- E. 0.08  
F. 80  
G. 800  
H. 8,000

101. For what value of  $x$  is the equation

$$\frac{x}{5} - 4 = 3(4 - 2x) - 1$$
 true?

- A.  $\frac{75}{11}$   
B.  $\frac{75}{31}$   
C.  $\frac{15}{7}$   
D.  $\frac{65}{31}$

102.



The diagram above shows line segment RS intersecting a rectangle. What is the measure of angle  $y$ ?

- E.  $140^\circ$
- F.  $130^\circ$
- G.  $50^\circ$
- H.  $40^\circ$

103.

ESSAY LENGTH

Number of Words	Number of Essays
<100	6
100–250	4
251–500	11
>500	9

All 150 students in Grade 8 at a school are assigned to write an essay on the same topic. A teacher records the number of words in a random sample of the essays, as shown in the table above. Based on this sample, how many students in the entire grade would be expected to write essays with **at least** 100 words?

- A. 20
- B. 30
- C. 100
- D. 120

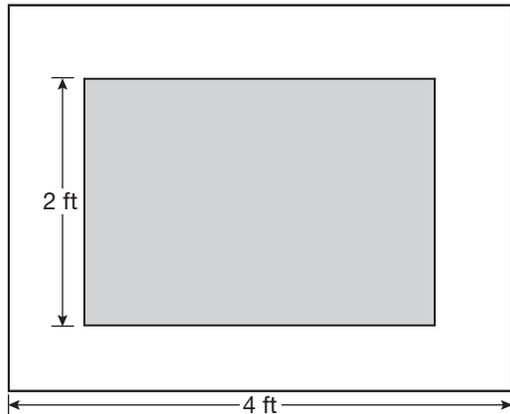
104. Which percentage is closest in value to 0.0099?

- E. 0%
- F. 0.1%
- G. 1%
- H. 100%

105. Anita played 3 games and had a mean score of 140. Tariq played 2 games and had a mean score of 90. What was the mean of the scores for all 5 of these games?

- A. 100
- B. 115
- C. 120
- D. 230

106.



In the figure above, the shaded rectangle is similar to the outer rectangle. The length of the outer rectangle is 4 feet, and the perimeter of the outer rectangle is 14 feet. If the width of the shaded rectangle is 2 feet, what is the area of the shaded rectangle?

- E.  $5\frac{1}{3}$  sq ft
- F. 6 sq ft
- G.  $9\frac{1}{3}$  sq ft
- H. 12 sq ft

107. A rectangular concrete driveway is 30 feet long, 8 feet wide, and 6 inches thick. What is the volume of the concrete?

- A. 44 cu ft
- B. 48 cu ft
- C. 120 cu ft
- D. 240 cu ft

108. The greatest common factor of 24 and  $x$  is 8. How many possible values for  $x$  are greater than 10 and less than 70?

- E. 8
- F. 7
- G. 6
- H. 5

109. Vicente and Carla each ran 8 laps around a track. They started at the same time and place. If Vicente ran 1.5 times as fast as Carla, how many laps did Carla have left to finish when Vicente finished his 8th lap?

- A.  $2\frac{1}{2}$
- B.  $2\frac{2}{3}$
- C.  $3\frac{1}{3}$
- D.  $5\frac{1}{3}$

110. At West College, students are randomly assigned to one of 20 dormitories and one of 6 dining rooms. Kharleen likes 6 of the dormitories and 2 of the dining rooms. What is the probability that she is assigned to both a dormitory and a dining room that she likes?

- E. 10%
- F. 12%
- G. 19%
- H. 38%

111. A train travels 2,200 miles from Phoenix to New York City. The train covers the first 240 miles in 5 hours. If the train continues to travel at this rate, how many **more** hours will it take to reach New York City? Round your answer to the nearest whole hour.

- A. 46
- B. 45
- C. 43
- D. 41

112. What is the **least** of four consecutive integers whose sum is 58?

- E. 1
- F. 2
- G. 12
- H. 13

113.



If all possible values of  $x$  are indicated by the shaded part of the number line above, which number line best shows all possible values of  $\frac{1}{x}$ ?



114. Chanelle selects a marble from a container and then returns it to the container. When she does this 3 times, the probability of choosing a red marble all 3 times is  $\frac{1}{216}$ . Based on this information, what is the probability of Chanelle choosing a red marble the **first** time she selects a marble?

- E.  $\frac{1}{72}$
- F.  $\frac{1}{36}$
- G.  $\frac{1}{8}$
- H.  $\frac{1}{6}$

## REVISING/EDITING PART A

1. The question asks how the paragraph should be revised.

**C: Correct.** Changing the word “studies” from the present tense to the past tense “studied” is necessary to match the past tense established in the paragraph (“spent,” “recited”). Additionally, the comma after the word “emotions” needs to be removed because the words “emotions and motivations” are part of a group (series) of two elements, and when there are only two elements in a series, a comma is not used.

**A: Incorrect.** The revisions in Option A introduce new errors. The word “spent” is correct in the past tense because that is the tense used throughout the rest of the paragraph. Additionally, adding a comma after the word “play” would be incorrect because it would separate the prepositional phrase “at the community theater” from the rest of the sentence.

**B: Incorrect.** The revisions in Option B introduce new errors. The word “did” is correct as written in the past tense because the past tense is used throughout the paragraph. There is no comma needed after the word “projection” because “so” is not functioning as a conjunction but rather as part of the conjunction phrase “so that,” which does not take a comma.

**D: Incorrect.** The revisions in Option D introduce new errors. The word “recited” is correct as written in the past tense because the past tense is used throughout the paragraph. Also, removing the comma after “times” is incorrect because the comma is needed in order to separate the modifying phrase “making slight adjustments and improvements to his performance each time” from the main clause.

- 
2. The question asks for the revision that corrects the error in sentence structure in the paragraph.

**E: Correct.** The first sentence of the paragraph is a run-on because both clauses—“The land on Earth has not always been separated into the seven continents” and “at one time a massive supercontinent, known as Pangaea, covered one-third of Earth’s surface”—are independent clauses. Independent clauses are complete sentences, and two complete sentences should not be combined with just a comma. The revision in Option E is correct because it separates the two sentences by placing a period where it is needed after “continents” and by capitalizing the word “At.”

**F: Incorrect.** While adding a semicolon after “surface” can be considered a correct way to separate the independent clauses “at one time a massive supercontinent, known as Pangaea, covered one-third of Earth’s surface” and “Additionally, the supercontinent was surrounded by ocean waters called Panthalassa, much of which were in Earth’s Southern Hemisphere,” this change does not address the sentence structure error in the paragraph (the run-on sentence). The use of a period separating the independent clauses (complete sentences) is correct as is.

**G: Incorrect.** Adding a period after “Panthalassa” would separate the dependent clause “much of which were in Earth’s Southern Hemisphere” from its subject: “ocean waters called Panthalassa.” The dependent clause cannot stand on its own because it shares elements with the main clause. A dependent clause is not a complete sentence and must be joined with an independent clause. The clause beginning with “much of which” is an adjective for “ocean waters.” Changing the comma to a period creates a new error (a sentence fragment) and does not address the existing sentence structure error at the beginning of the paragraph (the run-on sentence).

**H:** Incorrect. Removing the period after “crust” would create a run-on sentence because the period is needed to separate two complete sentences—“Geologists believe that the supercontinent split apart over millions of years because of the movement of the tectonic plates that form Earth’s crust” and “In fact, experts predict that over the next 250 million years the movement of the plates will cause the seven continents to merge into a supercontinent again.” A comma after “crust” would combine these sentences into a run-on, creating a new error in the sentence without fixing the existing sentence structure error (the run-on sentence) at the beginning of the paragraph.

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3. The question asks for the identification of the sentence that has an error in its construction and should be revised.

**B: Correct.** Sentence 2 contains a structural error. The current placement of the phrase “where the Nets played for thirty-five seasons” suggests the phrase is modifying the term “financial troubles,” which is illogical. The phrase “where the Nets played for thirty-five seasons” should immediately follow the location, “New Jersey.” A revised version of the sentence might read: “After the team had financial troubles, the owner of the Nets decided to take the team to New Jersey, where the Nets played for thirty-five seasons.”

**A:** Incorrect. There are no errors in the structure of sentence 1. The modifying phrase “who played in the Long Island area at the time” correctly modifies the noun “New York Nets.”

**C:** Incorrect. There are no errors in the structure of sentence 3. The phrase “including two appearances in the NBA finals” is a nonrestrictive clause that provides further detail about the team’s “sixteen playoff appearances.” The phrase is set off by a comma because it is not essential to understanding the meaning of the sentence.

**D:** Incorrect. There are no errors in the structure of sentence 4. The phrase “after a change in ownership” is a nonrestrictive clause that provides further detail about the team in 2012. The phrase is set off by commas because it is not essential to understanding the meaning of the sentence.

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4. The question asks for the best way to combine the sentences to clarify the relationship between the ideas.

**G: Correct.** The sentence in Option G is the best way to combine the sentences because it accurately reflects the relationship between the ideas by using the nonrestrictive phrase “which allow scientists to collect data about the planet and its moons” to describe the purpose of the flyby missions. The idea that the missions “have been happening since 1973” follows the nonrestrictive phrase.

**E:** Incorrect. Even though the two ideas from the original sentences are incorporated into the sentence in Option E, the use of the conjunction “while” in the first part of the sentence suggests that there is a simultaneous but unrelated relationship between the two ideas, which is incorrect.

**F:** Incorrect. The sentence in Option F incorporates the ideas from both sentences, but the conjunction “although” suggests that scientists were allowed to collect data even though there were flyby missions, which is an inaccurate way to express the relationship between the ideas.

**H:** Incorrect. The sentence in Option H uses the conjunction “but” to connect the ideas in the two original sentences. This suggests an adverse relationship between ideas, which is an inaccurate way to connect the ideas expressed in the original sentences.

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## REVISING/EDITING PART B

### Cracking the Code

5. The question asks for the best way to combine sentences 3 through 5 to clarify the relationship between ideas.
- B: Correct.** The sentence in Option B accurately shows the relationship between the ideas of the sentences. Before people can construct programs that will perform detailed and complex tasks, they have to learn a coding language.
- A: Incorrect.** While this sentence shows a relationship between the ideas, it does not clarify the relationship accurately. Learning the language of code does not depend on people's previous ability to construct programs that will perform detailed and complex tasks.
- C: Incorrect.** This sentence does not accurately express the relationship between ideas, because the sentence implies that some people who code do not have to learn the language. The passage clearly states that "computer code is part of every electronic interaction" (sentence 1) and that "programmers use it to instruct computers to perform different tasks" (sentence 2).
- D: Incorrect.** The conditional (If . . . then) construction of the sentence in Option D does not convey the intended relationship of the ideas in the sentences. The "then" statement ("they can construct programs that will perform detailed as well as complex tasks") does not follow the condition of the "if" statement ("people who code have to learn this language").
- 
6. The question asks for the sentence that should follow sentence 5 to best state the main claim in the passage.
- E: Correct.** This sentence logically follows sentence 5 and incorporates the two main points in the passage: that coding has become important in many diverse occupational fields (sentence 10) and that there are several ways that people can learn how to code (sentence 14).
- F: Incorrect.** While this sentence incorporates a point made in the passage about how coding can benefit many occupational fields (sentence 10), this idea alone does not address the entire argument in the passage.
- G: Incorrect.** While this sentence incorporates ideas about opportunities to learn coding skills in school (fourth paragraph), the larger claim presented in the passage is not about opportunities schools should offer in order to help students learn to code. The passage primarily focuses on the opportunities offered to people who take on the challenge of learning to code.
- H: Incorrect.** Although the passage discusses the opportunities that are available to some students to learn coding skills in school (sentences 15–16), this point is a supporting detail of the passage, not the main claim of the passage.
- 
7. The question asks for the best revision of sentence 10 to provide a transition to the third paragraph.
- B: Correct.** This sentence provides the best revision of the transition sentence. The second paragraph ends with "the possibilities for applying them are infinite" (sentence 9), which supports the idea that people in "many occupational fields" (sentence 10) can benefit from having coding skills. The third paragraph illustrates this idea by providing specific examples of occupations that benefit from coding (stock market traders and doctors).

**A:** Incorrect. Some readers may choose this option because the second paragraph does discuss the complexities of coding; however, it does not discuss the difficulties of learning coding. The third paragraph demonstrates some of the complex ways coding is used in specific fields but does not illustrate how difficult learning coding may be.

**C:** Incorrect. While it is suggested in the passage that employers in the health-care industry recognize the importance of coding skills (sentence 12), the third paragraph focuses on examples of coding within different occupations, not specific employers' analyses of what makes coding skills important.

**D:** Incorrect. Some readers may choose this option because the second paragraph provides a brief definition of coding—"A coding language uses letters, numbers, and symbols that are arranged in a way that makes sense to a computer" (sentence 6)—which shows how this element of programming works, but the second paragraph does not specifically discuss what makes the field of computer programming unique. The third paragraph discusses how coding can be used in a variety of occupational fields (sentence 10).

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8. The question asks which sentence would best follow sentence 13 and support the ideas in the third paragraph.

**H: Correct.** This sentence provides specific evidence of the job market favoring potential employees who have coding ability. It supports what is stated in sentence 13, that "jobs that require coding skills are typically higher paying."

**E:** Incorrect. While this sentence provides an example of a high salary, which is mentioned in the paragraph (sentence 13), the part about "Experienced programmers, software engineers, and system administrators at large companies" focuses on specific occupations that may use coding, as opposed to the range of diverse occupations discussed in the third paragraph.

**F:** Incorrect. While sentence 12 does mention coding skills in the medical field as an example, the information provided in this answer supports only that idea and not the other ideas expressed in the third paragraph.

**G:** Incorrect. This sentence generally discusses employers looking for "experience in a specific industry as well as knowledge of basic coding," but the third paragraph discusses the possibilities of using coding skills in a variety of occupations, not companies looking for specific industry experience.

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9. The question asks which concluding sentence would best follow sentence 20 and support the argument presented in the passage.

**B: Correct.** The sentence successfully summarizes the main argument of the passage, which is that coding is involved in all electronic interaction (sentence 1) and is a useful skill to master, especially in many occupational fields (sentence 10).

**A:** Incorrect. While the passage does state that "jobs that require coding skills are typically higher paying" (sentence 13), it does not say or imply that coding skills are needed for most high-paying jobs.

**C:** Incorrect. In the fourth paragraph, the passage does promote students taking advantage of opportunities to learn coding; however, this information is a supporting detail and would not serve as a strong conclusion to the argument presented in the passage.

**D:** Incorrect. Some readers may choose this sentence because the fourth paragraph discusses how "some students may become interested in learning how to create programs, such as games and apps" (sentence 18), but this detail is only one part of the overall argument in the passage.

## READING COMPREHENSION

### A Miracle Mile

10. The question asks how the words “feat,” “humanly impossible,” and “impenetrable barrier” in paragraph 1 affect the tone of the paragraph.

**F: Correct.** No one had ever been able to run a mile in less than four minutes, and the words “feat,” “impossible,” and “impenetrable” imply that the goal seemed unattainable. These words also reinforce the comparison of running a four-minute mile to “scaling Mount Everest” (paragraph 1).

**E: Incorrect.** Although paragraph 1 states that “several elite runners aimed to break that supposedly impenetrable barrier,” the words “feat,” “humanly impossible,” and “impenetrable barrier” suggest that the goal was unattainable even for the most skilled runners.

**G: Incorrect.** The words “feat,” “humanly impossible,” and “impenetrable barrier” describe how challenging and almost impossible running a four-minute mile seemed, and while other elite runners “aimed to break that supposedly impenetrable barrier” (paragraph 1), the paragraph focuses on Roger Bannister, not the competition among elite runners seeking to break the record.

**H: Incorrect.** Bannister’s training program is described in paragraphs 3 and 4, and the words “feat,” “impossible,” and “impenetrable” are used in paragraph 1 to describe the magnitude of Bannister’s goal to run a four-minute mile. Though his training program was intense, these words relate to the intensity of the goal itself, not to the intensity of his training.

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11. The question asks how interval training affected Bannister’s performance.

**C: Correct.** As paragraph 3 states, the goal of Bannister’s training program was to “develop endurance and speed,” which are synonyms of the words “stamina” and “pace.”

**A: Incorrect.** The moderation of his pace was achieved through the use of “rabbits,” described in paragraph 6, more than through his method of interval training.

**B: Incorrect.** Bannister worked individually during the interval training period and then paced himself with a two-person team of “rabbits,” which were introduced in paragraph 5 and explained in paragraph 6. It was the use of “rabbits” during the race that helped him conserve some of his effort, not the interval training.

**D: Incorrect.** During the interval-training process, Bannister “let his body recover for two minutes” (paragraph 3).

---

12. The question asks which sentence best supports the idea that Bannister needed an alternative to “logical planning” in order to accomplish his goal.

**H: Correct.** The sentence from paragraph 4 explains that Bannister reached a point where he could not improve his time despite the strict training plan he had created. Taking a break from his training to spend time mountain climbing “permitted his muscles to recuperate and left him feeling refreshed” (paragraph 4).

**E: Incorrect.** The outcome of the 1952 Olympics, referenced in the sentence from paragraph 2, is what prompted Bannister to seek a new goal: “Determined to redeem himself, Bannister . . . focused on the ultimate prize—breaking the four-minute-mile barrier” (paragraph 2).

**F: Incorrect.** The sentence from paragraph 3 does not show an alternative to Bannister’s training plan to “develop endurance and speed” (paragraph 3) and his focus on using logical planning in order to accomplish his goal.

**G:** Incorrect. The sentence from paragraph 4 focuses on details of his training plan, explaining the “intensive interval training” (paragraph 3) that Bannister used to build his endurance and speed, not an alternative form of preparation.

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**13.** The question asks which sentence indicates that Bannister nearly made a mistake that would have cost him the world record.

**C: Correct.** If Bannister had begun running faster than the “steady but grueling pace” (paragraph 7) set by his “rabbit,” he would likely not have had enough energy to finish the race. As paragraph 6 notes, “the runner conserves about 15 percent of his or her effort” by allowing the “rabbit” to set the pace. Bypassing the “rabbit” at that point in the race could have cost Bannister energy and, in turn, the record.

**A:** Incorrect. The sentence from paragraph 4 describes a challenge Bannister faced during his training period, when he used “intensive interval training to develop endurance and speed” (paragraph 3). Bannister ran laps on a “quarter-mile track” (paragraph 3) and was able to control his pace at this time—unlike during the actual race to break the record.

**B:** Incorrect. The sentence from paragraph 6 describes the start of the race and Brasher’s role as “first rabbit” for Bannister. Bannister was behind Brasher, following their plan for breaking the record.

**D:** Incorrect. The sentence from paragraph 7 describes how Bannister leaped ahead of Chataway, his second “rabbit,” at the appropriate time in the effort to break the record. Chataway had “surged forward, leading Bannister at this same punishing rate for another lap and a half” (paragraph 7) before Bannister moved past him.

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**14.** The question asks what idea is conveyed by the phrase “a new mindset had taken root” in paragraph 8.

**E: Correct.** After Bannister ran the mile in under four minutes, it became clear to other runners that this goal was within the realm of human ability, and “soon after Bannister’s achievement, four other athletes matched his performance” (paragraph 8).

**F:** Incorrect. While the passage states that runners broke the four-minute-mile barrier after Bannister initially broke it (“Soon after Bannister’s achievement, four other athletes matched his performance” [paragraph 8]), running a four-minute mile is still impressive and a challenge for elite runners.

**G:** Incorrect. Although runners most likely knew that the training needed in order to break the four-minute-mile barrier was difficult and intensive, the phrase “a new mindset had taken root” focuses on their belief in the possibility of breaking the four-minute-mile barrier, which had been viewed as a “supposedly impenetrable barrier” (paragraph 1), not the idea that the training was difficult.

**H:** Incorrect. Even though “four other athletes matched his performance” and “the record continued to fall” (paragraph 8), the phrase “a new mindset had taken root” does not refer to the idea that there was an increase in the number of runners entering races just to try breaking the four-minute-mile barrier.

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**15.** The question asks how Bannister’s loss in the 1952 Olympics influenced his decision to pursue breaking the four-minute-mile barrier.

**C: Correct.** Bannister sought to redeem himself after “he finished in a dismal fourth place” at the Olympics (paragraph 2). He thought that his performance “was a disappointment for him and his country, Great Britain,” and he responded by setting a goal to successfully conquer the four-minute mile, which was considered the “ultimate prize” (paragraph 2).

**A:** Incorrect. While Bannister recognized the weaknesses that led to his poor performance in the Olympics and worked “to develop endurance and speed” (paragraph 3), the loss made him “determined to redeem himself” (paragraph 2). The desire for redemption influenced Bannister to focus specifically on running a mile in under four minutes, rather than on winning other races or training for other distances.

**B:** Incorrect. Although Bannister developed an “intensive interval training” plan to improve his “endurance and speed” (paragraph 3), he applied a different approach only after his progress toward a four-minute mile reached a “plateau” (paragraph 4) in 1954. It was his desire to “shave off at least one more second in order to reach his target” (paragraph 4) that prompted him to take a break from interval training and go mountain climbing for three days.

**D:** Incorrect. Bannister’s loss at the 1952 Olympics motivated him to change his training focus to reaching the “ultimate prize” (paragraph 2) of breaking the four-minute-mile barrier, which no other runner had accomplished. His loss at the Olympics did not present him with a specific opportunity to reach this goal.

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**16.** The question asks how the author’s use of chronological structure contributes to the development of ideas in the passage.

**H: Correct.** The chronological structure of the passage follows the progression of Bannister’s training from his loss at the 1952 Olympics to the race where he ran the first sub-four-minute mile on May 6, 1954 (paragraph 5).

**E:** Incorrect. While paragraph 4 mentions the “plateau” Bannister dealt with and the break that “permitted his muscles to recuperate,” the chronological structure of the passage focuses mainly on the progression of Bannister’s process over time.

**F:** Incorrect. Even though the passage suggests that Bannister’s ability to break the four-minute-mile barrier improved and that he felt “prepared to attempt to break the world record” (paragraph 4), the chronological structure of the passage primarily serves to show how Bannister’s progress over time led to his success.

**G:** Incorrect. The chronological structure of the passage begins with an acknowledgement that Bannister was inspired to break the four-minute-mile barrier by his loss at the 1952 Olympics (paragraph 1); however, the overall organization of the passage highlights his dedicated efforts over time to break the four-minute-mile barrier.

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**17.** The question asks how the sentences from paragraph 7 contribute to the development of ideas in the passage.

**A: Correct.** The sentences from paragraph 7 show that toward the end of the race, Bannister knew that the goal of breaking the four-minute-mile barrier was within his grasp and that he had the focus necessary to achieve it. The sentence following Bannister’s quotation states that he did indeed meet his goal, crossing “the finish line in 3 minutes 59.4 seconds” (paragraph 7).

**B:** Incorrect. The feelings Bannister expressed in the sentences from paragraph 7 did not erase those related to his loss at the 1952 Olympics, which were what drove him to the achievement he was about to make.

**C:** Incorrect. While the quotation states Bannister felt “unity,” the sentences from paragraph 7 capture Bannister’s focus on his chance to break the barrier and what he was feeling at that moment.

**D:** Incorrect. The sentences from paragraph 7 express a feeling of realization that Bannister was on the verge of reaching a goal. The sentences show that in the seconds before crossing the finish line, Bannister was fully focused on the end goal and was not thinking about his training or his running technique.

## Ode to Fireworks

**18.** The question asks what the fireworks in the poem represent about the speaker.

**F: Correct.** The speaker misses the experience of watching the fireworks display with family and friends but understands that time has progressed and that life is now different. The lines “This was a treat we waited / all year for” (lines 6–7) highlight the significance of the memory of waiting for and watching the fireworks. In the speaker’s present, the lines “I remember the feel of the pickup truck bumping / across the ridged field” (lines 40–41) emphasize the key details from the experience that stand out in the speaker’s mind when something in the current environment reminds the speaker of the past.

**E:** Incorrect. While the speaker misses elements of the past, the speaker is also positive about the present, with comparisons to a “constant celebration” (line 33) and descriptions of “the music of people” (line 36). The speaker does not indicate a desire to return to a simpler way of living.

**G:** Incorrect. While the speaker does share details about the present and the tone is generally positive, the fireworks do not suggest that the speaker has high expectations for how everyday life should be. The third stanza (lines 28–42) describes some of the speaker’s imaginings about the aspects of going about one’s daily life, but the speaker does not form expectations from these fantasies.

**H:** Incorrect. While the speaker does mention discussing cloud shapes with a family member in lines 19–20, the fireworks serve as a more general reminder of the speaker’s past life. Viewing the bright lights of the city makes the speaker recall memories of the speaker’s past and the feelings of anticipation before the fireworks show.

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**19.** The question asks what the comparison in lines 8–9 of the poem is used to convey.

**A: Correct.** In lines 8–9 the speaker compares the deep thumping noises at the start of a fireworks show to the muffled thumping sound made when beating a rug to clean it. The imagery of “low, dull *thwumps*” (line 8) (onomatopoeia) describes a sound that is not clear or powerful. To the speaker, these low, distant explosions are the signal that the fireworks display is starting and that the loud, cracking sound of fireworks will be heard soon (“Then we counted the seconds between the lightning / and thunder” [lines 10–11]).

**B:** Incorrect. The comparison in lines 8–9 deals with the low sound of the first fireworks shooting off rather than the streaks of light they emit. To the speaker, the low “*thwumps*” (onomatopoeia) are the signal that fireworks are about to explode overhead, much like the way a streak of lightning during a storm indicates that a crash of thunder will follow in a few seconds.

**C:** Incorrect. The *thwump* (onomatopoeia) sounds are the start of the fireworks show, not thunder. As a comparison, the speaker says the initial “*thwumps*” of the fireworks signal anticipation for the full explosion that will come, much like the way the speaker would watch for lightning and count the seconds before an impending thunderclap (lines 10–11).

**D:** Incorrect. The muffled *thwump* (onomatopoeia) sounds occur before the dazzling explosion of lights and before sparks start to fall from the sky. The comparison focuses on the sounds of the experience, not the sight of the experience.

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20. The question asks what the word choice in lines 22–23 of the poem conveys about the speaker.

**H: Correct.** The word “jewels” creates a picture of watching shining and sparkling explosions in the night sky and suggests that this experience holds sentimental and emotional value for the speaker. The speaker cherishes the memory of the experience.

**E: Incorrect.** The word “jewels” is used figuratively to indicate the sentimental value that the experience of watching the fireworks holds for the speaker. There is no indication in the poem that the speaker values material possessions.

**F: Incorrect.** The use of the word “jewels” highlights the importance of the memory in the speaker’s mind. The imagery in the words “written upon” expresses the way the bright streaks of light curve and fly across the night sky, not that the speaker views the fireworks display as “magical.”

**G: Incorrect.** The speaker describes the elements of the fireworks display that stand out most clearly. The view of the bright, colorful fireworks streaking across the sky is distinct, but it is not unique to the country setting.

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21. The question asks what the use of italics on the word “*night*” in line 24 is most likely intended to emphasize.

**B: Correct.** The italics are intended to place emphasis on one key aspect of nighttime—total darkness. The speaker is making a point that night in the country was truly dark, unlike the night the speaker currently experiences in a city, where light emitted from buildings and vehicles prevents complete darkness.

**A: Incorrect.** The purpose of italicizing the word “*night*” is not to convey mystery. While the speaker refers to not knowing the exact location where the firework viewing took place (“in the stubble of what had been / somebody’s cornfield” [lines 25–26]), the emphasis on “*night*” is meant to highlight the darkness and contrast the bright light from the fireworks soaring across the sky.

**C: Incorrect.** The tone in the second stanza is positive, showing admiration for the beauty visible in true darkness rather than fear: “But it was another thing to see / the sky at night written upon / with those jewels” (lines 21–23).

**D: Incorrect.** The speaker is talking about the general experience of watching fireworks on several occasions, not focusing on the events of a specific night. The use of italics on the word “*night*” emphasizes the speaker’s memory of the persistent darkness.

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22. The question asks what the purpose is of the repeated words “rising and falling” in lines 26 and 37.

**F: Correct.** The first mention of these words occurs during a recollection of the speaker’s past, and the second takes place during a description of the speaker’s present. The speaker looks to the connections between the country setting (“All around us, crickets / stridulated in the stubble of what had been / somebody’s cornfield, their song rising and falling” [lines 24–26]) and the city setting (“And the music around me is the music of people, / their voices rising and falling in a hundred languages” [lines 36–37]) as a source of comfort.

**E: Incorrect.** These lines do not provide insight into the speaker’s interactions or feelings of solitude. The speaker mentions the emptiness of the country and the crowds in the city, but these repeated words are meant to draw a connection between the locations rather than show differences between them.

**G:** Incorrect. Even though the lines call out specific sounds, the purpose of the repetition of the words in the two parts of the poem is to show how the speaker connects the two settings. The “rising and falling” of the sounds are one detail the speaker highlights.

**H:** Incorrect. The repetition of the words “rising and falling” is used to compare the different locations in the speaker’s life, not to compare fireworks to the sounds of crickets in the country or to the sounds of people moving and talking in the city.

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**23.** The question asks what impact the phrase “Everything is a constant celebration” (line 33) has in the poem.

**C: Correct.** From the speaker’s perspective, the constant light (“awash in light” [line 32]) contributes to the speaker’s feeling that, in the city, celebratory fireworks are ever-present. In comparison, fireworks lit up the country sky only for celebratory occasions or annual events (“In autumn my mother drove us to the edge of the field / where the fair was set up year after year” [lines 1–2]).

**A:** Incorrect. The speaker describes a sense of happiness and contentment in both the city and the country and does not indicate that one setting is more pleasurable than the other.

**B:** Incorrect. The word “celebration” has a positive association and does not imply that the speaker is overwhelmed in the city. Throughout the third stanza (lines 28–42), the speaker conveys appreciation for the elements of the city that make it different from the country (“And the music around me is the music of people, / their voices rising and falling in a hundred languages” [lines 36–37]).

**D:** Incorrect. While the speaker observes many things going on in the city at a given moment, the “constant celebration” in line 33 is intended to convey a comparison to the speaker’s previous experience in the country rather than emphasize the hectic pace of life in the city. The continual light and sounds in the city remind the speaker of lights and sounds experienced only on occasion in the country.

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**24.** The question asks how the memory in lines 41–42 affects the speaker.

**H: Correct.** The memory of watching the fireworks on the way home creates a sense of comfort that stays with the speaker (“escorted us home”). The speaker looks forward to moments when the youthful experience (“childhood bursts”) of being excited by something like a fireworks display can be a source of happiness.

**E:** Incorrect. The speaker does not express concern in these lines about the impossibility of returning to childhood or the past. For the speaker, the past and the memories associated with it are a source of comfort and a way to remember simpler times (“I remember the feel of the pickup truck bumping / across the ridged field” [lines 40–41]).

**F:** Incorrect. While the speaker recalls anticipation before the start of a fireworks display, there is no hint that the speaker is impatient. Particularly in lines 41–42, the speaker is reminded of the expectation of hearing and seeing fireworks and the sense of simple contentment felt in the experience (“I find myself / craning my neck upward at odd moments” [lines 29–30]).

**G:** Incorrect. The speaker is reflecting on past experiences and pointing out the elements of the city that remind the speaker of these past experiences. The speaker acknowledges the differences between the country and city settings but does not convey regret for leaving the rural area (“This is where we live now, / and it is how we live now, awash in light / of every hue” [lines 31–33]).

## Excerpt from “A Research Riddle Resolved”

25. The question asks how the sentence from paragraph 2 contributes to the overall structure of the excerpt.

**D: Correct.** The sentence from paragraph 2 serves as a transition from the introductory idea of “the animal still captures our imagination anew and irresistibly attracts the attention of science writers everywhere” (paragraph 1) to the central idea that the platypus has great scientific significance.

**A: Incorrect.** While the sentence from paragraph 2 does mention the platypus’s unique appearance, the remainder of the excerpt does not focus on the physiology of the platypus but instead focuses on the significance of scientists’ platypus research and what it can “tell us about people” (paragraph 4).

**B: Incorrect.** Paragraph 1 discusses the platypus as the “duck-billed” animal that “still captures our imagination anew and irresistibly attracts the attention of science writers everywhere,” but highlighting the idea that the platypus’s unusual appearance has attracted scientist’s attention is not how the sentence from paragraph 2 fits into the overall structure of the excerpt.

**C: Incorrect.** Paragraph 1 states that “the May 2008 *Nature* report detailing the DNA insides of the duck-billed platypus invited colorful tales from just about every mainstream media outlet,” but it does not discuss current ideas in the field. Paragraph 2 focuses on the “scientific surprise” of the platypus.

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26. The question asks what the phrase “evolutionary DNA tapestry” in paragraph 3 conveys about the platypus.

**E: Correct.** In the excerpt, the term “tapestry” conveys the sense of a rich history; the “platypus heritage” described in paragraph 3 is woven together with “threads” from mammals, birds, and reptiles in its genetic background.

**F: Incorrect.** While paragraph 3 does mention mammals and reptiles, it does not discuss when the platypus developed traits from those classifications. Rather, it refers in general to “hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree.”

**G: Incorrect.** The excerpt never claims that, compared with other animals, the platypus is the best resource for studying the evolution of animal genomes. The excerpt indicates that the platypus’s status as a “scientific oddity” provides “a window into a time in history when mammals became unique—gaining the ability to bear live young, produce milk for them, and grow a warm, furry coat” (paragraph 6).

**H: Incorrect.** The excerpt states that the platypus genome is a “scientific oddity” (paragraph 6) that is useful to researchers, but the reason it is useful is because of DNA evidence that shows “a window into a time in history when mammals became unique” (paragraph 6), not because its genes have never been altered.

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27. The question asks how paragraph 8 fits into the overall structure of the excerpt.

**A: Correct.** Paragraph 8 acts as a transition from the discussion of how “our own, modern-day genomes are still a big mystery” (paragraph 7) to the discussion of how scientists use comparative genomics to compare “human genes with those from animals” (paragraph 8).

**B: Incorrect.** Paragraph 8 introduces the practice of comparing “human genes with those from animals,” but it does not clarify or provide details about how scientists solved the problem of studying complex human genomes using comparative genomics.

**C: Incorrect.** Rather than contrasting the effort of the study of the human genome with the effort of a separate study of animal genomes, paragraph 8 discusses a study that is comparing human and animal genomes in order “to see what has been kept the same and what has evolved to be different.”

**D:** Incorrect. While the mention in paragraph 8 of “3 billion DNA ‘letters’ ” certainly highlights the enormous challenge of fully analyzing the human genome, the point of paragraph 8 is to transition the excerpt to the topic of how comparative genomics can shed light on the human genome.

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**28.** The question asks for the best summary of the section “Same and Different” (paragraphs 9–11).

**G: Correct.** This sentence describes the most important idea of the section: the discovery of genes that humans have in common with other species that can yield information about human disease. As stated in paragraph 10, “The goal of this research is to find regions of similarity and difference in order to better understand the structure and function of human genes.”

**E:** Incorrect. The fact that the platypus is the latest species whose genome is being compared with the human genome is just a detail of this section. The focus of the section is on the fact that comparing genomes can teach us about human disease. Paragraph 9 reveals this when it states that “scientists compare the genome sequences of several species: human, mouse, and a wide variety of other organisms from single-celled fungi to elephants and, now, the platypus.”

**F:** Incorrect. While comparative genomics is a way to examine many different species, this detail is not the main point of this section. Paragraph 10 notes that the “goal of this research” focuses on the fact that comparing genomes can teach us about human disease.

**H:** Incorrect. While this section does mention the use of computers in comparative genomics, this information is a detail about how the research is carried out; the computers are a tool in discovering whether “this information may translate into ways to understand, treat, and prevent human diseases” (paragraph 11).

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**29.** The question asks how the details in paragraphs 12–14 about the platypus’s different abilities convey a central idea of the excerpt.

**D: Correct.** In describing the platypus’s different abilities, paragraph 12 states that “the findings traced the evolutionary path from birds and reptiles to mammals.” Paragraphs 12–14 elaborate on the findings to support a central idea of the excerpt, which is that the platypus is rare in having bird, reptile, and mammal DNA.

**A:** Incorrect. The fact that “platypuses have genes that make the milk protein casein: ”(paragraph 13) just like humans do is an important supporting detail, but it is not a central idea of the excerpt.

**B:** Incorrect. While paragraph 14 explains that the platypus produces venom “like its ancestral snake and lizard cousins,” which suggests the platypus has the ability to defend itself, this information is a supporting detail and not a central idea of the excerpt.

**C:** Incorrect. Paragraphs 12–14 do state that the platypus has lost some of its “chicken-ness” (paragraph 12) while gaining traits in common with mammals and reptiles, but this information is a supporting detail and not a central idea of the excerpt.

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**30.** The question asks how the author elaborates on the idea that creating a full analysis of platypus DNA was an important scientific endeavor.

**E: Correct.** The importance of the research into platypus DNA is explained in the excerpt through descriptions of what this research can teach us about human genetics and disease. The question is raised directly in paragraph 4 and begins to be answered in paragraph 6 (“The platypus genome results . . . provide

researchers a window into a time in history when mammals became unique—gaining the ability to bear live young, produce milk for them, and grow a warm, furry coat”). This importance is also addressed in the “Same and Different” section (paragraphs 9–11) and in paragraphs 15 and 16.

**F:** Incorrect. The comparison of the platypus with its bird and reptile relatives in paragraphs 12–15 is important to locating the platypus on its evolutionary family tree and in showing the connection between DNA and functionality. This comparison does not, however, explain the excerpt’s main reason for asserting that the analysis of platypus DNA was an important scientific endeavor.

**G:** Incorrect. The excerpt begins with a description of the platypus’s appeal because of its “cuteness and weirdness” (paragraph 2) and goes on to explain the genetic reason for the animal’s “patchwork of genes” (paragraph 2). However, this information does not address the reason why the analysis of platypus DNA is considered an important scientific endeavor.

**H:** Incorrect. Understanding how genetics can be aligned to physiological function is important to understanding why such research can reveal information about human health and disease, which is the real importance of this scientific endeavor, rather than the discussion of physiological function itself.

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**31.** The question asks how researching the genomes of other animals can inform scientists’ understanding of human health and disease.

**B: Correct.** Paragraph 11 explains that finding ways that animal genomes are similar to the human genome helps researchers “locate signals that control how genes work.”

**A:** Incorrect. Although tracking how other animals evolved helps researchers better understand our “rich and diverse planet” (paragraph 18) through understanding genes, the potential benefits to human health will not necessarily preserve or sustain nature.

**C:** Incorrect. While paragraph 11 does point out that all living things share an ancestor, the idea that they, therefore, share genetic traits is only implied. This idea does not contribute to the main focus of the research.

**D:** Incorrect. The statement that “understanding how other animals are similar to one another helps researchers find new ways to understand the human genome” is too general to provide support for the main focus of the genetic research described in the excerpt. To learn more about human health and disease, scientists need to understand the similarities between the genetic material of animal species, not the similarities between the animals themselves.

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**32.** The question asks which sentence from the excerpt best supports the idea that the same DNA material results in the same traits even in different classes of animals.

**H: Correct.** The sentence from paragraph 14 describes two different classes of animals—reptiles and monotremes—that have the ability to create venom, a trait that resulted from the same DNA material “mixed and matched together.”

**E:** Incorrect. The sentence from paragraph 2 describes the combination of DNA material from several classes of animals that makes up platypus DNA; however, the sentence does not address whether any of those different animals share traits or whether they share some of the same DNA.

**F:** Incorrect. The sentence from paragraph 3 emphasizes the relationship between two different classes of animals—reptiles and mammals—by discussing when they branched off the same evolutionary tree. However, the sentence does not address whether those classes of animals share any traits.

**G:** Incorrect. The sentence from paragraph 4 questions whether platypus DNA can teach us something about humans and human disease, which implies that there must be something in common between these two animals. However, it does not state that these two animals actually share traits or DNA.

### Excerpt from “How We Made the First Flight”

**33.** The question asks how paragraph 1 introduces the idea that the Wright brothers knew that their flight attempt was risky.

**A: Correct.** Paragraph 1 describes the Wright brothers sending “the signal” to notify the lifesaving crew to stand by as they attempted flight; the need for lifesaving experts to be available in case of an accident introduces the idea that the attempted flight might crash.

**B:** Incorrect. By themselves, the specifics on the speed of the wind do not emphasize the danger of the flight. And while the brothers admitted that the strong wind posed certain risks, they also noted that the windy conditions might make landing safer (“estimated that the added dangers in flight would be partly compensated for by the slower speed in landing” [paragraph 1]).

**C:** Incorrect. The slower landing was expected as a result of the windy conditions, but it was not part of a plan to increase the safety of the flight.

**D:** Incorrect. While the Wright brothers’ initial decision to wait to see if the wind would die down does suggest they were concerned about the safety of the flight, the explanation of their decision to proceed with the flight shows that they expected one benefit from the poor weather: “the slower speed in landing” (paragraph 1).

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**34.** The question asks how the sentence from paragraph 4 contributes to the development of ideas in the excerpt.

**G: Correct.** The sentence from paragraph 4 indicates that the Wright brothers had agreed to take turns attempting to achieve the first flight, which suggests their eagerness to each be the first to successfully fly the machine.

**E:** Incorrect. The sentence from paragraph 4 does not refer to the challenge of the winter conditions during the flight attempt.

**F:** Incorrect. While the sentence from paragraph 4 specifically references a previous flight several days earlier, it does not state how many attempts came before Wilbur’s attempt on December 14th.

**H:** Incorrect. Orville’s trial came about merely as a result of turn-taking, which would suggest that there was no greater likelihood of success or reason to be more confident than there had been for previous attempts.

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**35.** The question asks what idea is most clearly conveyed by the words “only,” “nevertheless,” and “finally” in the sentence from paragraph 5.

**D: Correct.** The words in the sentence from paragraph 5 suggest that, though the first flight may not have lasted very long or taken the pilot very far, the Wright brothers accomplished something no one had been able to do before: successfully pilot an airplane in flight.

**A:** Incorrect. Although the duration of the flight was short, and a successful flight had taken a long time to achieve, the words in the sentence from paragraph 5 are used to emphasize the remarkable nature of the flight, not the length of time it had taken the Wright brothers to finally be successful.

**B:** Incorrect. While the hope for longer flights is easy to imagine, the words in the sentence from paragraph 5 do not relate directly to this sentiment; instead, they describe the groundbreaking success of the Wright brothers' flight.

**C:** Incorrect. While the capabilities of the aircraft were demonstrated during the flight, the words in the sentence from paragraph 5 do not apply solely to the machine but also to the efforts of the people who designed it, built it, and actually made it fly.

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**36.** The question asks how the sentence from paragraph 5 helps convey Orville Wright's perspective about the first flight.

**F: Correct.** In the sentence from paragraph 5, Orville uses the wind velocity and the machine speed to highlight the distance that the plane covered while in the air and to determine the distance that it would have flown on a day with calm winds, which emphasizes the magnitude of the accomplishment.

**E:** Incorrect. Since there is no indication in the sentence from paragraph 5 that Orville took these measurements while he was flying the plane, the idea that he maintained a scientific approach when attempting flight is an assumption rather than fact. It also does not account for the equivalent distance of the flight in calm air, which emphasizes the importance of the accomplishment.

**G:** Incorrect. Since Orville does not suggest in the sentence from paragraph 5 how far the plane traveled under the actual conditions of high winds, the comparison is incomplete. Additionally, this statement does not address the reason that he would make such a comparison, which allowed him to describe the flight in more impressive terms (540 feet versus 120 feet).

**H:** Incorrect. Unlike the wind velocity calculations made in preparation for the flight, which along with pilot experience might help in determining the success of future flights, the calculations that Orville provides in the sentence from paragraph 5 interpret the results of the first flight and communicate its success.

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**37.** The question asks how the details in paragraph 5 about the uneven nature of the flight convey a central idea of the excerpt.

**C: Correct.** The details in paragraph 5 describe the difficulties that the weather conditions and mechanical issues presented and how Orville's flight was successful despite the issues. The ability of the Wright brothers to overcome difficult circumstances and complete the first flight is a central idea of the excerpt.

**A:** Incorrect. Paragraph 5 explains that the rudder was unbalanced and the effect that this issue had on the flight, but the rudder was only part of the reason for the short flight. The length of the flight is not a central idea of the excerpt.

**B:** Incorrect. Although paragraph 5 does explain that the equipment contributed to the difficulty of controlling the plane's flight, the lack of control over the flight is not a central idea of the excerpt, which is the fact that the Wright brothers achieved a successful flight in spite of the challenges involved.

**D:** Incorrect. While paragraph 5 does emphasize the difficulty caused by the wind, it does not describe a "gradual change" in the wind, only that it was "irregular."

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**38.** The question asks which sentence from the excerpt supports the idea that the Wright brothers had to adapt their flight plans to accommodate weather conditions.

**F: Correct.** The sentence from paragraph 1 reveals that the Wright brothers adapted by making a risk calculation, based on the wind speed, before the flight. The high speed of the wind could cause difficulties in flight while simultaneously allowing for a slower, more controlled landing.

**E: Incorrect.** Although the sentence from paragraph 1 mentions the rainy weather and frozen puddles, it does not specifically explain how these weather conditions forced the brothers to adapt their plans for the flight.

**G: Incorrect.** The sentence from paragraph 4 does mention wind, but it describes what Wilbur was doing during the attempted flight, not the factors he considered before the flight in order to adapt the plan.

**H: Incorrect.** Although the sentence mentions the “irregularity of the air” during the flight, the sentence from paragraph 5 does not describe how the brothers adapted their flight plans based on the weather.

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**39.** The question asks how the use of chronological structure contributes to the development of ideas in the excerpt.

**A: Correct.** Through the chronological structure, Orville addresses all stages of the flight in a way that builds from flight concerns and preparations for takeoff to his experiences during the flight and while accomplishing the successful landing.

**B: Incorrect.** While obstacles are presented within the excerpt, the chronological structure emphasizes the events that ended in the successful achievement of flight on that day rather than how the Wright brothers overcame obstacles.

**C: Incorrect.** The chronological structure of the excerpt does not show that the Wright brothers applied lessons learned from their previous attempts at flight; instead, the structure describes Orville’s December 17th attempt.

**D: Incorrect.** While Orville’s narrative certainly shows a strong need to analyze wind speed, this idea is not conveyed through the chronological structure of the excerpt. Additionally, the description of the first flight on December 17th indicates that it did not take place in ideal conditions (“We realized the difficulties of flying in so high a wind” [paragraph 1] and “The course of the flight up and down was exceedingly erratic, partly due to the irregularity of the air” [paragraph 5]).

### Excerpt from *In Search of the Unknown*

**40.** The question asks how paragraph 2 helps develop the plot.

**G: Correct.** The phrase “uncompromising refusals” in paragraph 2 indicates the confidence that the narrator initially has in his belief that the animals described in the letters are not of value to the society. This confidence is badly shaken as the plot unfolds, as when Professor Farrago states that “I am daring to believe that it is the great auk itself” (paragraph 23). The narrator’s transition from an attitude of dismissive doubt to one of budding hopefulness is a major part of the plot of the excerpt (“But I was not shocked; on the contrary, I was conscious that the same strange hope that Professor Farrago cherished was beginning, in spite of me, to stir my pulses, too” [paragraph 34]).

**E: Incorrect.** As paragraph 1 indicates, writing such letters is one of the main parts of the narrator’s job (“and I was always busy, part of the day, in dictating answers to correspondents”), and he shows no indication that this work is unnecessary. The letters are to inform people whether the zoo will accept their animals.

**F:** Incorrect. Paragraph 2 indicates that the narrator offers his letters to the professor merely for official approval. At the start of the excerpt, the narrator is confident in his reply and does not anticipate that his response will differ from that of the professor, so he has no need to “predict what the professor would say.”

**H:** Incorrect. The narrator does not resent the professor’s review of the letters; instead, the phrase “of course” in paragraph 2 shows that he expects to submit the letters to the professor as part of his job.

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**41.** The question asks what the phrase “a faint trace of apology” in paragraph 3 conveys about the professor.

**D: Correct.** The professor is both amused and annoyed by the narrator’s dismissal of the possibility that great auks still exist, and the professor knows that the narrator is likely to react negatively to being sent on what the narrator considers a “fool’s errand” (paragraph 25).

**A:** Incorrect. The fact that the narrator had intended to leave the office for the day is not the source of the professor’s faintly apologetic manner, which is instead caused by the professor’s understanding that their conversation about the letter and the expedition is likely to cause an argument (“with a whimsical smile that suggested amusement, impatience, annoyance” [paragraph 3]).

**B:** Incorrect. The paragraphs that follow the sentence from paragraph 3 show the professor sharing his opinions without pause, even when his opinion of the narrator is unflattering (“Like swimming squirrels, you navigate with the help of Heaven and a stiff breeze, but you never land where you hope to—do you?” [paragraph 17]).

**C:** Incorrect. The professor knows that the narrator will push back regarding the letter, but the professor is not uncomfortable challenging the narrator. Professor Farrago seems perfectly at ease and comfortable as he begins the discussion with the narrator.

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**42.** The question asks how the exchange between the professor and the narrator in paragraphs 8–11 contributes to the development of the excerpt.

**E: Correct.** Paragraphs 8–10 describe the narrator communicating his firm belief that the writer of the letter about the auks is either “a liar or a fool” (paragraph 9). However, paragraph 11 reveals that the professor disagrees with the narrator’s assessment of Halyard, the man who wrote the letter (“He isn’t—in mine,” said the professor, placidly”). This difference between the opinions of the narrator and the professor is the central conflict of the excerpt.

**F:** Incorrect. Paragraphs 8–11 reveal a disagreement between the narrator and the professor (“to my surprise, he appeared to waver” [paragraph 8]) and do not describe collaboration or show them working together.

**G:** Incorrect. Although the narrator initially distrusts the contents of the letter and shows “contemptuous tolerance for the writer” (paragraph 8), the excerpt portrays the professor as experienced and intelligent, not as one who is easily deceived. In fact, the professor ultimately convinces the narrator that the letter may in fact contain accurate information about the great auks.

**H:** Incorrect. While the narrator does begin to consider the professor’s perspective at the end of the excerpt, paragraphs 8–11 primarily serve to establish the disagreement between the narrator and the professor about the writer of the letter.

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43. The question asks how the professor's observations in paragraphs 15–17 create tension in the excerpt.

**A: Correct.** The professor criticizes “‘you young fellows’ ” (paragraph 15), suggesting that the ideas of young scientists like the narrator are unsupported (“‘like swimming squirrels,’ ” [paragraph 17]) and inaccurate (“‘but you never land where you hope to—do you?’ ” [paragraph 17]; “‘you embark on a theory for destinations that don’t exist’ ” [paragraph 15]). The narrator then becomes “red in the face” (paragraph 18), indicating that the narrator is upset by the professor's criticism, and asks the professor about the great auk in an attempt to defend himself.

**B: Incorrect.** While the narrator does experience a negative reaction to the professor's words, the professor is being genuine, not sarcastic. In fact, the sarcasm comes from the narrator in paragraph 14 (“‘It is generally accepted,’ I replied, sarcastically, ‘that the great auk has been extinct for years. Therefore I may be pardoned for doubting that our correspondent possesses a pair of them alive’ ”), not from the professor.

**C: Incorrect.** The professor's observations cause the narrator to blush with embarrassment (“‘rather red in the face’ ” [paragraph 18]), but the narrator understands the point that the professor is making about the narrator's acceptance of the idea that great auks do not exist. The narrator recognizes that the professor is criticizing his youthful ideas, not his opinion.

**D: Incorrect.** The professor shows amusement with the narrator's perspective. The narrator is embarrassed and upset by the professor's words, but the narrator does not display frustration with the professor's lack of interest in a commonly held view of the existence of a certain species of bird.

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44. The question asks how the interaction between the narrator and the professor in paragraphs 26–28 contributes to the development of the theme.

**H: Correct.** Paragraph 26 describes the professor and the narrator making practical plans for the expedition (“‘we made out a list of articles necessary for me and itemized the expenses I might incur’ ”), indicating the narrator's acceptance of his assignment while also revealing that he does not anticipate a “successful termination to the expedition.” Paragraph 28 further describes the personal objections of the narrator, who believes that adding extra men to the expedition is pointless (“‘a useless expense’ ”) since he does not expect to find any great auks to bring back.

**E: Incorrect.** Paragraphs 26–28 do not show the narrator arguing against making the expedition. He instead argues that it is unnecessary for the professor to pay to send extra men on the expedition. The narrator points out that he can ask for assistance if he does, in fact, find a great auk (“‘None,’ I replied, bluntly; ‘it’s a useless expense, unless there is something to bring back. If there is I’ll wire you, you may be sure’ ” [paragraph 28]).

**F: Incorrect.** When the professor criticizes the narrator's blind acceptance of the theory about the existence of the auks, the narrator is frustrated and embarrassed. This frustration does not stem from his inability to make decisions for the zoological society.

**G: Incorrect.** The professor states that “‘what I want you to do is to get those birds here safely’ ” (paragraph 27), which indicates that his main priority is the birds' safety rather than acquiring specimens regardless of the consequences (i.e., at any cost).

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45. The question asks how the author develops the contrast between the narrator's point of view and the professor's point of view.

**B: Correct.** The primary conflict of the excerpt revolves around the narrator's disagreement with the professor about whether the letter about the great auks could be true. As the two men converse, their contrasting attitudes toward the letter become clear: the narrator dismisses the possibility of great auks out of hand (" 'of course the man is mistaken' " [paragraph 5]; " 'here is a man . . . who wants you to send somebody to take charge of a bird that doesn't exist!' " [paragraph 12]), while the professor calmly admits that although " 'nine hundred and ninety-nine men in a thousand would throw that letter aside and condemn the writer' " (paragraph 9), he himself believes that the writer could be telling the truth (" 'How do you know,' asked Professor Farrago, 'that the bird in question does not exist?' " [paragraph 13]).

**A: Incorrect.** The excerpt does not describe the narrator's thoughts about how age and experience influence the professor's reasoning in enough detail to fully contrast them against the thoughts about the narrator that the professor expresses in paragraphs 15–17. The narrator's idea that the professor might be "on the verge of dotage" (paragraph 24) is meant in a humorous way.

**C: Incorrect.** The professor explains why he disagrees with the narrator (paragraphs 19–21), but he does not make persistent efforts to convince the narrator or change his own mind about the letter. Instead he states that the narrator will go on an expedition to retrieve " 'whatever it is that our correspondent has' " (paragraph 23), thereby requiring the narrator to go collect the great auks whether he believes in them or not.

**D: Incorrect.** The point of the dialogue is not to explain the subordinate-supervisor relationship between the narrator and the professor but rather to contrast what each character believes about the contents of the letter.

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**46.** The question asks how paragraph 34 helps develop the plot of the excerpt.

**E: Correct.** Despite his initial disbelief, the narrator admits in paragraph 34 that he is starting to feel the "same strange hope" the professor feels, which is to find the great auks (paragraph 33).

**F: Incorrect.** While the narrator does make an effort in paragraphs 11–22 to understand the professor's thinking, paragraph 34 reveals that the narrator has been affected by the professor's "strange hope" for the auks and is beginning to share this hope "in spite of" himself.

**G: Incorrect.** The narrator describes a feeling of hope in paragraph 34 that would not be present if he had simply been overruled by the professor and did not share any of the professor's belief in the possibility that the auks exist.

**H: Incorrect.** The narrator does not express a sense of urgency in paragraph 34 to begin the expedition. Instead, he expresses hope that the great auks might really exist.

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**47.** The question asks which sentence best demonstrates the professional relationship between the narrator and the professor.

**C: Correct.** The sentence from paragraph 25 reveals that while the narrator disagrees with the professor ("this fool's errand was none of my conceiving"), he obeys because he works for the professor ("there was nothing to do but to obey").

**A: Incorrect.** Although the professor's asking for the narrator's personal opinion about the letter shows that they have respect for each other's views, the sentence from paragraph 8 does not convey the relationship between a subordinate employee (the narrator) and a superior (the professor).

**B: Incorrect.** The sentence from paragraph 24 presents the narrator's immediate internal reaction to the professor's words. The sentence emphasizes that the professor's belief in the great auk's existence is so

outrageous that the narrator initially thinks the professor is starting to lose touch with reality. This is a momentary reaction to the professor's words, not a demonstration of the professional relationship between the two.

**D:** Incorrect. The professor's good-humored offer of assistance in the sentence from paragraph 29 does not best demonstrate the underlying employer-employee relationship between the professor and the narrator. The narrator has to go on the expedition because the professor, his boss, told him to.

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**48.** The question asks which sentence from the excerpt best explains why the professor is eager to send the narrator on an expedition.

**H: Correct.** The sentence from paragraph 33 reveals the professor's excitement to get "the rarest of living creatures," the great auk. The narrator states in paragraph 14 that "it is generally accepted . . . that the great auk has been extinct for years," which would make a living auk incredibly rare and explains the professor's eagerness for the narrator to go on the expedition.

**E:** Incorrect. The sentence from paragraph 23 tells what animal the professor believes the narrator will find on the expedition (the great auk), but it does not explain why the professor is so excited to find this particular animal.

**F:** Incorrect. Although the sentence from paragraph 27 expresses the professor's interest in having the narrator bring the birds back safely, it does not show the underlying reason why the safety of the birds is so crucial, which is that the great auk is extremely rare.

**G:** Incorrect. The sentence from paragraph 33 explains why the professor believes the letter writer—he feels a gut instinct—but it does not explain why he is so eager to find out whether his instinct is correct.

### Is It Time for Term Limits?

**49.** The question asks for the best summary of the discussion of congressional term policy outlined in paragraph 2.

**D: Correct.** The summary of paragraph 2 accurately presents the idea that members of Congress, in contrast to the president, do not have term limits and calls out the idea that recent surveys show that some Americans think this should change.

**A:** Incorrect. The summary focuses on term lengths that members of the House of Representatives and of the Senate serve rather than on term limits.

**B:** Incorrect. The summary incorrectly places an emphasis on the idea that some Americans are troubled by the discrepancy between the president having term limits and members of Congress not having term limits. However, it is not the discrepancy that troubles people; it is the fact that members of Congress can be reelected an unlimited number of times.

**C:** Incorrect. While the summary mentions increased support for term limits, it neglects to mention the contrast between the president having term limits and members of Congress not having term limits.

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**50.** The question asks which sentence from the passage supports the idea that congressional term limits would "benefit our government" (paragraph 2).

**G: Correct.** Joe Lieberman's comments in paragraph 3 strongly suggest that Congress is currently too partisan and rigid and that term limits would help correct this, thus benefiting our government.

**E:** Incorrect. The sentence from paragraph 2 states the fact that members of Congress can run for reelection an unlimited number of times; it does not suggest that this is unhealthy.

**F:** Incorrect. While the sentence from paragraph 2 shows that many Americans believe that term limits would be beneficial, it offers no actual evidence to support this idea.

**H:** Incorrect. The sentence from paragraph 7 offers a statistic regarding how frequently members of Congress are replaced. However, no suggestion is made as to whether the situation is good or bad or whether term limits would be healthy.

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**51.** The question asks how the quotations in paragraph 3 convey a central idea of the passage.

**A: Correct.** The quotations in paragraph 3 from former Senator Joe Lieberman and the writers Olson and Rogowski focus on how term limits might help members of Congress work together more cooperatively, even across party lines, “ ‘and improve the quality of representation.’ ”

**B:** Incorrect. The fact that politicians and law experts have opinions about term limits is not a central idea of the passage, though those opinions can be used to support arguments for or against term limits.

**C:** Incorrect. While paragraph 3 begins with the idea that “American citizens are not the only supporters of term limits for Congress,” the quotations do not suggest that citizens tend to agree with expert opinions on term limits; the expert opinions in paragraph 3 are simply offered as further support for term limits.

**D:** Incorrect. The implication that term limits could “ ‘encourage compromise’ ” by affecting how members of Congress campaign and vote is a supporting detail and not a central idea of the passage.

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**52.** The question asks which statement best describes how the sentence in paragraph 5 fits into the overall structure of the passage.

**H: Correct.** The author uses the sentence in paragraph 5 to demonstrate a transition from the benefits of term limits to the idea that newcomers could have a severe effect on policies.

**E:** Incorrect. While the sentence in paragraph 5 does imply that term limits are controversial, it merely begins to suggest one of the reasons for the controversy without offering actual evidence.

**F:** Incorrect. The sentence in paragraph 5 does not offer ideas complete enough to constitute a summary of the consequences of term limits.

**G:** Incorrect. Before paragraph 5, the passage explores possible effects of term limits on the ability of Congress to function.

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**53.** The question asks how, according to paragraph 5, serving more terms improves politicians' effectiveness.

**C: Correct.** Paragraph 5 makes it clear that “experienced politicians have a deep knowledge of congressional processes, and in addition, politicians who have served together for extended periods have a chance to develop trusting relationships, even across party lines.” Therefore, serving more terms helps experienced politicians gain expertise.

**A:** Incorrect. Paragraph 5 does not say that serving more terms motivates politicians to learn congressional processes, only that politicians restricted by term limits are not motivated to gain expertise.

**B:** Incorrect. While paragraph 5 states that serving more terms helps a politician “develop trusting relationships, even across party lines,” it does not explain how serving more terms improves politicians’ effectiveness.

**D:** Incorrect. While paragraph 4 states that “term limit supporters point out that career politicians may base key decisions on their own personal long-term goals,” paragraph 5 does not mention this idea or state that creating new policies while fostering their own careers would improve their effectiveness.

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**54.** The question asks why setting term limits for members of Congress potentially increases the influence of special-interest groups.

**E: Correct.** The passage explains in paragraphs 5 and 6 that representatives who lack experience might end up relying on lobbyists’ expertise. Paragraph 6 uses information from the National Conference of State Legislators Study, which indicated that state lawmakers were “depending on special-interest groups for their expertise on issues.” This example on a state level is used to show that “term limits may increase the influence of lobbyists” (paragraph 6).

**F:** Incorrect. While lobbyists can work with representatives, it is not required. The passage implies that some of the deep knowledge many politicians gain is from spending time in office and from developing “trusting relationships” (paragraph 5) with colleagues.

**G:** Incorrect. The passage does discuss the drawbacks of forcing experienced representatives from their seats, but it does not provide support for the idea that new representatives will focus on the agendas of special-interest groups.

**H:** Incorrect. The passage states that experienced representatives “have a deep knowledge of congressional processes, and in addition, politicians who have served together for extended periods have a chance to develop trusting relationships, even across party lines” (paragraph 5). The author states that the concern is only for new representatives who might seek help or guidance from lobbyists.

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**55.** The question asks how the author of the passage mainly develops the idea that congressional term limits might have negative effects.

**B: Correct.** In paragraphs 5 and 6, the author discusses the fact that members of Congress who lack experience might fail to develop good political relationships, fail to learn processes, and rely too much on lobbyists. For example, paragraph 6 uses information from the National Conference of State Legislators Study, which reveals that “term limits may increase the influence of lobbyists.”

**A:** Incorrect. While the author states that “politicians who have served together for extended periods have a chance to develop trusting relationships, even across party lines” (paragraph 5), it is never stated in the passage how long it takes politicians to build connections with one another.

**C:** Incorrect. The author does introduce the idea that new politicians are “‘more likely to rely on outsiders, including lobbyists, to replace that expertise’ ” (paragraph 5), but the passage does not present the ways that lobbyists seek to influence the decisions of new representatives.

**D:** Incorrect. Paragraph 7 does give statistics on turnover rates: “Thomas E. Mann, Senior Fellow in governance studies at the Brookings Institution, notes that every decade, new members replace at least half the members of the House and the Senate, due to retirement or elections.” However, this information does not support the idea that term limits might have negative effects.

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**56.** The question asks with which statement the author of the passage would most likely agree.

**G: Correct.** Given that the author presents strong arguments and supporting evidence both for and against setting term limits, the author would most likely agree that both sides have compelling reasons supporting their positions. The passage ends with the author's suggestions that "perhaps one day people will have a chance to vote on the issue" (paragraph 8). The author never argues for a particular side of the argument.

**E: Incorrect.** While the author presents a good description of why expertise is important for lawmakers, the author does not give this argument greater weight than other arguments in the passage.

**F: Incorrect.** While paragraph 2 does state that "modern surveys conducted by multiple firms consistently show that American citizens of a variety of backgrounds and political leanings approve of the idea of setting term limits for members of Congress," the author never suggests that term limits are the most pressing issue facing voters today and never compares this issue to any other issues.

**H: Incorrect.** While the author discusses in paragraphs 5 and 6 the dangers of special-interest groups having excessive influence on lawmakers, the author never suggests that special-interest groups may influence the issue of term limits itself.

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**57.** The question asks how the tables at the end of the passage contribute to the development of ideas in paragraph 7.

**A: Correct.** The tables show that members of Congress have a greater chance of getting reelected today than they did in 1950, supporting the idea from paragraph 7 that the average length of time in office has increased: "Still, the average length of time in office has mushroomed. For example, the 65th Congress (1917–1919) had an average service time of 5.3 years for members of the House of Representatives and 5.7 years for Senate members. The 114th Congress (2015–2017) had an average of 8.8 years for members of the House and 9.7 years for senators."

**B: Incorrect.** While the tables suggest that the reelection rate for members of Congress has shifted upward since 1950 as explained in paragraph 7, the tables do not provide details about the number of times congresspeople have been reelected throughout their careers.

**C: Incorrect.** While the tables indicate that the reelection rates between the House and the Senate differ somewhat, the distinction between reelection rates of the two parts of Congress is unrelated to the main idea of paragraph 7 that "the average length of time in office has mushroomed."

**D: Incorrect.** The number of seats in the Senate is a minor detail that does not support an idea from paragraph 7, where the author focuses on current turnover "due to retirement or elections" and the fact that "the average length of time in office has mushroomed."

- 58. (5)** Simple interest ( $y$ ) is calculated by multiplying the initial deposit ( $p$ ), the interest rate ( $r$ ), and time ( $t$ ).

$$prt = y$$

$$(2,500)(0.04)t = 500$$

$$100t = 500$$

$$t = 5$$

- 59. (-9)**  $6 - 9 \div |-3| + (-2)^3 \times 1\frac{1}{2}$  Calculate the exponent and convert the mixed number to an improper fraction

$$6 - 9 \div |-3| + (-8) \times \frac{3}{2}$$
 Next, calculate the absolute value

$$6 - 9 \div 3 + (-8) \times \frac{3}{2}$$
 Perform the indicated multiplication and division

$$6 - 3 + (-12)$$
 Perform the addition and subtraction

$$3 + (-12) = -9$$

- 60. (4)**  $7x + 3 - 2(2x + 1) = 13$  Apply the distributive property; multiply the  $-2$  by  $2x$  and  $1$

$$7x + 3 - 4x - 2 = 13$$
 Combine like terms

$$3x + 1 = 13$$
 Apply the additive inverse property; subtract 1 from both sides of the equation

$$3x = 12$$
 Apply the multiplicative inverse property; divide both sides of the equation by 3

$$x = 4$$

- 61. (55)** Since vertical angles are congruent, the right triangle in the figure has acute angles with measures of  $35^\circ$  and  $x^\circ$ . The interior angles of a triangle sum to  $180^\circ$ , so set up an equation to solve for  $x$ :

$$90 + 35 + x = 180$$

$$125 + x = 180$$

$$x = 55$$

- 62. (19.2)** First, find the sum of the original 8 numbers. Let  $x$  equal the sum of those numbers and use the mean formula to solve for  $x$ :

$$\frac{x}{8} = 17$$

$$x = 136$$

Next, subtract the 3 discarded numbers from the sum:

$$136 - 9 - 11 - 20 = 96$$

Finally, calculate the mean of the remaining 5 numbers by dividing the new sum, 96, by 5:

$$\frac{96}{5} = 19.2$$

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**63. (C)**  $3^4 + 7^4 = 81 + 2,401 = 2,482$

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- 64. (E)** To solve, add the three given fractions:

$$1\frac{3}{4} + 2\frac{2}{3} + \frac{7}{8}$$

The common denominator is 24:

$$= 1\frac{18}{24} + 2\frac{16}{24} + \frac{21}{24}$$

$$= 4\frac{10}{24} + \frac{21}{24}$$

$$= 5\frac{7}{24}$$

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- 65. (C)** Calculate 215% of 220:

$$2.15(220) = 473$$

- 66. (F)** First, use a proportion to find out how many minutes it will take the sign to complete 8 revolutions. Let  $x$  equal the total number of minutes:

$$\frac{x}{8} = \frac{90}{1}$$

$$x = 720$$

Next, convert 720 minutes into hours and minutes:

$$\frac{720}{60} = 12 \text{ hours}$$

Finally, 12 hours after 2:30 p.m. is 2:30 a.m.

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- 67. (D)** First, find where Y is located on the number line. Point X is the midpoint of  $\overline{WY}$ . Since there are 2 units between W and X, there must also be 2 units between X and Y. Thus, Y is located at 4 on the number line.

Point Y is the midpoint of  $\overline{WZ}$ . Use the same reasoning as above. Since there are 4 units between W and Y, there must be 4 units between Y and Z. So, Z is located at 8 on the number line.

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- 68. (F)**  $\frac{81}{10} = \frac{9}{n}$  Cross multiply

$81n = 9(10)$  Apply the multiplicative inverse property; divide both sides of the equation by 81;

$$n = \frac{90}{81} = 1\frac{9}{81} = 1\frac{1}{9} \quad \text{then simplify the fraction}$$

**69. (A)** The expression  $3n + 3$  is equal to  $3(n + 1)$ , and it is given that this is an even number. The expression  $(n + 1)$  must also represent an even number, because 3 is an odd number and the product of an odd number and an even number is an even number. If  $(n + 1)$  is an even number, then  $n$  must be an odd number. Choose an odd number to substitute for  $n$  in the answer options to find which expression represents an even number:

Let  $n = 3$ .

Option A:

$$5n + 1 = 5(3) + 1 = 16$$

Option B:

$$4n + 5 = 4(3) + 5 = 17$$

Option C:

$$2n + 3 = 2(3) + 3 = 9$$

Option D:

$$n + 2 = 3 + 2 = 5$$

Since 16 is the only even number, the correct answer is option A.

**70. (F)** First, find the pairs of positive integers that multiply to 65:  $1 \times 65$  and  $5 \times 13$ . The sums of the pairs are 66 and 18. 18 is the option that is provided in the answer choices.

**71. (D)** The two greatest integers less than  $-3.25$  are  $-4$  and  $-5$ . Since  $-4$  is even, the answer is  $-5$ .

**72. (F)** First, calculate how many pages Mikah has left to read:

$$420 - 160 = 260$$

Then, divide 260 by 4 to calculate the mean number of pages he must read per hour to finish the assignment according to his plan:

$$\frac{260}{4} = 65$$

**73. (C)** First, convert  $\frac{29}{7}$  to a mixed number:  $\frac{29}{7} = 4\frac{1}{7}$ . The two consecutive integers on either side of  $4\frac{1}{7}$  are 4 and 5.

**74. (H)** First, calculate the actual total of the percentages shown, which is 101.9%. So, one of the percentages needs to be lower to make the total equal 99.9%. Only one option, H, proposes a decrease in the percentage. To check that this is the correct answer, add the percentages again with "Poor" as 4.7% instead of 6.7%. H is the correct answer.

**75. (D)** First, convert their heights from feet and inches to inches, by multiplying the number of feet by 12 and adding the inches:

$$\text{Roberto: } 6 \text{ feet} + 4.5 \text{ inches}$$

$$6(12 \text{ inches}) + 4.5 \text{ inches} =$$

$$72 \text{ inches} + 4.5 \text{ inches} = 76.5 \text{ inches}$$

$$\text{Joseph: } 5 \text{ feet} + 9 \text{ inches}$$

$$5(12 \text{ inches}) + 9 \text{ inches} =$$

$$60 \text{ inches} + 9 \text{ inches} = 69 \text{ inches}$$

Then, subtract Joseph's height from Robert's height:  $76.5 - 69 = 7.5$

- 76. (F)** Write the ratios in fraction form and solve for  $x$ :

$$\frac{x}{35} = \frac{20}{28} \quad \text{cross multiply}$$

$$28x = 700 \quad \text{Apply the multiplicative inverse property; divide both sides by 28}$$

$$x = \frac{700}{28} = 25$$

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**77. (C)**  $\frac{3^2 + (-8)^2 + 2^2}{(3 - 8 + 2)^2} = \frac{9 + 64 + 4}{(-3)^2} = \frac{77}{9}$

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- 78. (F)** First, calculate the amount of money Anya's parents contributed:  
 $2,000 - 1,200 - 240 = 560$ .  
Then, find what percentage of \$2,000 is \$560:

$$\frac{560}{2,000} = 0.28 = 28\%$$

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- 79. (C)** Substitute each answer option for  $p$  to see which value will work:

Option A:

If  $p = 2$ , then  $\frac{1}{2}n = 2$ , so  $n = 4$ . This cannot be the answer, because  $n$  cannot equal 4.

Option B:

If  $p = 3$ , then  $6q = 3$ , so  $q = 0.5$ . This cannot be the answer, because  $q$  cannot equal 0.5.

Option C:

If  $p = 6$ , then  $2m = 6$ , so  $m = 3$ ;  $6q = 6$ , so  $q = 1$ ; and  $\frac{1}{2}n = 6$ , so  $n = 12$ . This is the correct answer.

Option D:

If  $p = 12$ , then  $\frac{1}{2}n = 12$ , so  $n = 24$ . This cannot be the answer, because  $n$  cannot equal 24.

- 80. (G)** Three of the five numbers listed (0.001, 0.0001, and 0.00001) are less than 0.005. So, the probability of a person selecting a number less than 0.005 is  $\frac{3}{5}$ .

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- 81. (A)** If Lemont answered 6 out of 40 questions incorrectly, then he answered 34 questions correctly.

$$\frac{34}{40} = 0.85 = 85\%$$

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- 82. (G)** First, find the measures of the three angles inside the triangle. The lower left angle is supplementary to the one marked  $135^\circ$ , so the measure of that angle is  $180^\circ - 135^\circ = 45^\circ$ . The angle on top is a vertical angle with the one marked  $x^\circ$ , so the measure of that angle is also  $x^\circ$ . The angle on the lower right is a vertical angle with the one marked  $100^\circ$ , so the measure of that angle is also  $100^\circ$ . Since the measures of the three interior angles of a triangle sum to  $180^\circ$ , set up an equation and solve for  $x$ :

$$45 + x + 100 = 180$$

$$145 + x = 180$$

$$x = 35$$

- 83. (A)** Let  $x = 2$ , and substitute that value for  $x$  in each inequality to determine which one is correct:

Option A:

$$\frac{1}{3} > \frac{1}{4}. \text{ This is true.}$$

Option B:

$$\frac{1}{3} < \frac{1}{4}. \text{ This is false.}$$

Option C:

$$\frac{1}{3} - \frac{1}{4} > 1, \text{ or } \frac{1}{12} > 1. \text{ This is false.}$$

Option D:

$$\frac{1}{3} - \frac{1}{4} > \frac{1}{2}, \text{ or } \frac{1}{12} > \frac{1}{2}. \text{ This is false.}$$

Option A is the only true inequality.

- 84. (G)** First, use the information about the red balls to calculate the total number of balls in the basket:

$$\frac{1}{3} = \frac{12}{x} \quad \text{cross multiply}$$

$$x = 36$$

There are a total of 36 balls in the basket. The probability of selecting a green ball is 1 in 4. Use that information to calculate how many green balls are in the basket:

$$\frac{g}{36} = \frac{1}{4} \quad \text{cross multiply}$$

$$4g = 36 \quad \text{apply the multiplicative inverse property; divide both sides of the equation by 4}$$

$$g = 9$$

There are 9 green balls in the basket.

- 85. (B)** First, calculate Lars's average speed in kilometers per hour:

$$\frac{48}{2} = 24$$

Then, convert kilometers to miles:

$$\frac{m}{24} = \frac{1}{1.6} \quad \text{cross multiply}$$

$$m(1.6) = 24(1) \quad \text{apply the multiplicative inverse property; divide both sides of the equation by 1.6}$$

$$m = \frac{24}{1.6} = 15$$

- 86. (H)** Since integer  $x$  is evenly divisible by 3, substitute 3 for  $x$  in the answer options to determine which expression is also divisible by 3:

$$\text{Let } n = 3.$$

Option A:

$$2x + 1 = 2(3) + 1 = 7$$

Option B:

$$3x - 5 = 3(3) - 5 = 4$$

Option C:

$$4x - 1 = 4(3) - 1 = 11$$

Option D:

$$4x + 6 = 4(3) + 6 = 18$$

Option D is the only value that is divisible by 3.

- 87. (B)** There are currently 20 chips in the jar ( $6 + 10 + 4$ ). Of those chips, 14 are **not** red. So the probability of choosing a chip that is **not** red is  $\frac{14}{20} = \frac{7}{10}$ .

**88. (G)** There are 6 spaces, so first divide 100 by 6:  $100 \div 6 = 16$ , remainder 4. So, the arrow goes around 16 full times and then 4 more spaces. Four spaces from Space P is Space T.

**89. (A)** Call the 6 members A, B, C, D, E, and M (for Mei-Ling). The possible combinations are AB, AC, AD, AE, AM, BC, BD, BE, BM, CD, CE, CM, DE, DM, and EM. Of those pairs, 5 include Mei-Ling.

**90. (E)**

$$\frac{6 - 8(2 - t)}{2m + 4(3 - m)} = \frac{6 - 8[2 - (-1)]}{2(5) + 4(3 - 5)} = -$$

$$\frac{6 - 8(3)}{10 + 4(-2)} = \frac{6 - 24}{10 + (-8)} = \frac{-18}{2} = -9$$

**91. (D)** In a parallelogram, opposite angles are congruent, so the measure of the unmarked angle is  $56^\circ$ . The sum of the interior angles of a parallelogram is equal to  $360^\circ$ . Use that information to solve the problem:

$$x + y + 56 + 56 = 360$$

$$x + y + 112 = 360$$

$$x + y = 248$$

**92. (F)**  $JK = 6 - (-4) = 10$  units. Let  $x = JL$ . Then  $LK = 10 - x$ . Substitute these expressions in the given equation:

$$x = \frac{2}{3}(10 - x)$$

Solve for  $x$ :

$$x = \frac{2}{3}(10 - x)$$

Apply the multiplicative inverse property; multiply both sides of the equation by 3.

$$3x = 2(10 - x)$$

Apply the distributive property; multiply the 2 by 10 and  $x$ .

$$3x = 20 - 2x$$

Apply the additive inverse property; add  $2x$  to both sides of the equation.

$$5x = 20$$

Apply the multiplicative inverse property; divide both sides of the equation by 5.

$$x = 4$$

So, point L is 4 units to the right of point J:  $-4 + 4 = 0$ . Point L is located at 0 on the number line.

- 93. (C)** Let  $j$  be the number of stamps Josef has. Then Mai has  $j - 500$  stamps. The total number of stamps is  $j + (j - 500) = 2j - 500$ . Since Josef has 60% of the stamps, set up an equation to solve for  $j$ :

$$\frac{j}{2j - 500} = \frac{60}{100} \quad \text{cross multiply}$$

$$100j = 60(2j - 500) \quad \text{Apply the distributive property; multiply the 60 by } 2j \text{ and } 500$$

$$100j = 120j - 30,000 \quad \text{Apply the additive inverse property; subtract } 120j \text{ from both sides of the equation}$$

$$-20j = -30,000 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by } -20$$

$$j = 1,500$$

- 94. (F)** The area of the entire circle is  $\pi r^2$ . The fraction of the circle that is shaded is  $\frac{45}{360} = \frac{1}{8}$ . So, the area of the sector is  $\frac{1}{8}\pi r^2$ . Use that information to find  $r$ :

$$\frac{1}{8}\pi r^2 = 18\pi$$

$$r^2 = 144$$

$$r = 12$$

Use  $r$  to calculate the circumference of the circle:

$$c = 2\pi r = 2\pi(12) = 24\pi$$

The circumference is  $24\pi$  feet.

- 
- 95. (A)**  $-3x - 7 > -4$  Apply the additive inverse property; add 7 to both sides of the equation

$$-3x > 3 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by } -3. \text{ Note: when dividing inequalities by a negative number, the inequality sign is reversed.}$$

$$x < -1$$

The solution is that  $x$  is less than  $-1$ , so choose the graph that starts at  $-1$  and continues to the left.

- 96. (H)** First, set up the equations based on the information in the question.

$$R = 3S$$

$$T = \frac{1}{6}S$$

So, the ratio of R:T is

$$3S : \frac{1}{6}S$$

First, divide both sides by S to eliminate the variable. Then, multiply both sides by 6 to eliminate the fraction. The resulting ratio is 18:1.

- 97. (A)** If Ken gives 6 video games to Jeff, the number Ken has is  $k - 6$ , and the number Jeff has is  $j + 6$ . After the exchange, Ken has twice as many video games as Jeff. The equation is:

$$k - 6 = 2(j + 6)$$

- 98. (G)** So far, Sarah has read  $15\% + 17\% = 32\%$  of the entire book. That means she has  $100\% - 32\% = 68\%$  left to read.

$$68\% = \frac{68}{100} = \frac{17}{25}$$

- 99. (D)** First, list the first several multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48, 54 . . .

Every third multiple (i.e., 18, 36, 54, . . .) is also a multiple of 9. Thus,  $\frac{2}{3}$  of the multiples of 6 are not multiples of 9.

Next, calculate how many multiples of 6 are in the given number range. The last multiple of 6 would be 198. So, there are a total of  $\frac{198}{6} = 33$  multiples of 6. Since  $\frac{2}{3}$  of those are not multiples of 9, the answer is  $\frac{2}{3}(33) = 22$ .

- 100. (F)** First, calculate Kim's jogging time in minutes:

$$1 \text{ hour } 40 \text{ minutes} = 100 \text{ minutes}$$

Then, convert kilometers to meters:

$$8 \text{ kilometers} = 8,000 \text{ meters}$$

Now simplify the ratio to find the answer:

$$\frac{8,000}{100} = 80$$

- 101. (B)**  $\frac{x}{5} - 4 = 3(4 - 2x) - 1$  Apply the distributive property; multiply the 3 by 4 and  $-2x$

$$\frac{x}{5} - 4 = 12 - 6x - 1 \quad \text{Combine like terms}$$

$$\frac{x}{5} - 4 = 11 - 6x \quad \text{Apply the additive inverse property; add } 6x \text{ and } 4 \text{ to both sides of the equation}$$

$$\frac{x}{5} + 6x = 15 \quad \text{Get a common denominator}$$

$$\frac{x + 30x}{5} = 15 \quad \text{Apply the multiplicative inverse property; multiply both sides of the equation by } 5$$

$$31x = 75 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by } 31$$

$$x = \frac{75}{31}$$

**102. (E)** First, find the measures of the interior angles of the triangle formed by the line segment and the rectangle. The top angle on the right is a vertex of the rectangle, so the measure of that angle is  $90^\circ$ . The top angle on the left is supplementary to the given angle of  $130^\circ$ . So, the measure of that angle is  $180^\circ - 130^\circ = 50^\circ$ . The measure of the lower angle is  $40^\circ$ , since  $180^\circ - 90^\circ - 50^\circ = 40^\circ$ . Angle  $y$  is supplementary to the lower angle of  $40^\circ$ , so the measure of angle  $y$  is  $180^\circ - 40^\circ = 140^\circ$ .

**103. (D)** The number of students in the sample who wrote an essay with at least 100 words is 24 out of the 30 students. Write it as a fraction  $\frac{24}{30} = \frac{4}{5}$ . To predict the number of students in the entire grade who would write an essay with at least 100 words, find  $\frac{4}{5}$  of 150, which is  $\frac{4}{5}(150) = 120$ .

**104. (G)** Since 0.0099 is equal to 0.99%, the answer option closest to that value is 1%.

**105. (C)** The sum of the scores of Anita's 3 games is  $3(140) = 420$ . The sum of the scores of Tariq's 2 games is  $2(90) = 180$ . Add those two sums and divide by 5 to find the mean:

$$\frac{420 + 180}{5} = \frac{600}{5} = 120$$

**106. (E)** For the outer rectangle, the length is 4 feet and the perimeter is 14 feet. Write and solve an equation to find the width:

$$2(4) + 2w = 14 \quad \text{Apply the additive inverse property; subtract 8 from both sides of the equation}$$

$$2w = 6 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 2}$$

$$w = 3$$

Use that information in a proportion to find the length of the shaded rectangle:

$$\frac{x}{4} = \frac{2}{3} \quad \text{Cross multiply}$$

$$3x = 4(2) \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 3}$$

$$x = \frac{8}{3}$$

Now find the area of the shaded rectangle:

$$2 \times \frac{8}{3} = \frac{16}{3} = 5\frac{1}{3}$$

**107. (C)** First convert 6 inches to 0.5 feet. Then, calculate the volume, in cubic feet:

$$30 \times 8 \times 0.5 = 120$$

**108. (H)** First find the multiples of 8 that fall between 10 and 70:  
16, 24, 32, 40, 48, 56, 64  
Since the greatest common factor of 24 and  $x$  is 8,  $x$  cannot be 24 or 48 (otherwise the GCF would be 24, not 8).

There are 5 remaining values: 16, 32, 40, 56, and 64.

- 109. (B)** Vicente ran 1.5 times as fast as Carla, so that means for every lap Carla finished, Vicente finished 1.5 laps. Set up a proportion to calculate  $c$ , the number of laps Carla had completed when Vicente finished 8 laps:

$$\frac{c}{1} = \frac{8}{1.5} \quad \text{Cross multiply}$$

$1.5c = 8(1)$  Apply the multiplicative inverse property; divide both sides of the equation by 1.5

$$c = 5\frac{1}{3}$$

So, the number of laps Carla still had to finish is  $8 - 5\frac{1}{3} = 2\frac{2}{3}$ .

- 110. (E)** Kharleen likes  $\frac{6}{20} = \frac{3}{10}$  of the dormitories. She likes  $\frac{2}{6} = \frac{1}{3}$  of the dining rooms. Multiply those fractions together to calculate the probability of Kharleen being assigned to both a dormitory and a dining room that she likes:  $\frac{3}{10} \times \frac{1}{3} = \frac{1}{10} = 10\%$ .

- 111. (D)** First, find the speed of the train in miles per hour:  $240 \div 5 = 48$ .  
The number of miles left to travel is  $2,200 - 240 = 1,960$ .  
To find the number of hours left, use the equation  $rt = d$ :  
 $48t = 1,960$  Apply the multiplicative inverse property; divide both sides of the equation by 48  
 $t = \frac{1,960}{48} = 40\frac{5}{6}$   
That number rounded to the nearest whole hour is 41 hours.

- 112. (H)** Let  $n$  represent the least of the four integers. The other three integers are  $(n + 1)$ ,  $(n + 2)$ , and  $(n + 3)$ . Write an equation to solve for  $n$ :

$$n + (n + 1) + (n + 2) + (n + 3) = 58$$

$$4n + 6 = 58$$

$$4n = 52$$

$$n = 13$$

- 113. (D)** The shaded region goes from  $\frac{1}{2}$  to  $\frac{3}{2}$ . So, the possible values of  $\frac{1}{x}$  would be between the reciprocal of  $\frac{1}{2}$  and the reciprocal of  $\frac{3}{2}$ , which are 2 and  $\frac{2}{3}$ , respectively. Find the number line in the answer options that has a shaded region that ranges from  $\frac{2}{3}$  to 2, which is option D.

- 114. (H)** Let  $\frac{1}{x}$  be the probability of Chanelle selecting a red marble the first time. The probability of selecting a red marble three times is  $\frac{1}{x} \times \frac{1}{x} \times \frac{1}{x}$ , which is given as  $\frac{1}{216}$ . Since  $216 = 6 \times 6 \times 6$ , the value of  $x$  is 6, and the probability of Chanelle selecting a red marble the first time is  $\frac{1}{6}$ .

### Answer Key for Sample Form A

1. C	14. E	27. A	40. G	53. C	66. F	79. C	92. F	105. C
2. E	15. C	28. G	41. D	54. E	67. D	80. G	93. C	106. E
3. B	16. H	29. D	42. E	55. B	68. F	81. A	94. F	107. C
4. G	17. A	30. E	43. A	56. G	69. A	82. G	95. A	108. H
5. B	18. F	31. B	44. H	57. A	70. F	83. A	96. H	109. B
6. E	19. A	32. H	45. B	58. 5	71. D	84. G	97. A	110. E
7. B	20. H	33. A	46. E	59. -9	72. F	85. B	98. G	111. D
8. H	21. B	34. G	47. C	60. 4	73. C	86. H	99. D	112. H
9. B	22. F	35. D	48. H	61. 55	74. H	87. B	100. F	113. D
10. F	23. C	36. F	49. D	62. 19.2	75. D	88. G	101. B	114. H
11. C	24. H	37. C	50. G	63. C	76. F	89. A	102. E	
12. H	25. D	38. F	51. A	64. E	77. C	90. E	103. D	
13. C	26. E	39. A	52. H	65. C	78. F	91. D	104. G	

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# NEW YORK CITY PUBLIC SCHOOLS

## *2019 Specialized High Schools*

### ADMISSIONS TEST

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#### GENERAL DIRECTIONS

##### Identifying Information

Turn to Side 1 of the answer sheet. **Line 1** says, “I am well enough to take this test and complete it. I understand that once I break the seal of the test booklet, I may not be eligible for a make-up test. I am a New York City resident and a Grade 8 student taking a Grade 8 test. I understand that a student who is not a New York City resident, who takes the test more than once in a given school year, or who takes the test at the wrong grade level will be disqualified from acceptance to any of the Specialized High Schools.” Sign your name in the space following the word “signature.” Do not print your name. **Notify the proctor immediately if you are ill or should not be taking this test. Do not sign the statement or begin the test. Return your answer sheet to the proctor.**

On **Line 2**, print today’s date, using the numbers of the month, the day, and the year. On **Line 3**, print your birth date with the number of the month first, then the number of the day, then the last two digits of the year. For example, a birth date of March 1, 2005, would be 3-1-05.

In **Grid 4**, print the letters of your first name, or as many as will fit, in the boxes. Write your name exactly as you did on the application. If you have a middle initial, print it in the box labeled “MI.” Then print the letters of your last name, or as much as will fit, in the boxes provided. Below each box, fill in the circle that contains the same letter as the box. If there is a space or a hyphen in your name, fill in the circle under the appropriate blank or hyphen.

Make **dark marks** that **completely fill the circles**. If you change a mark, be sure to erase the first mark completely.

**Grid 5** is for your choice of Specialized High Schools. If Grid 5 is not marked correctly, your admission to a Specialized High School will be affected because your admission is based on the score you achieve and the order in which you rank your school preferences in this grid. The school choices indicated on your answer sheet are final. Therefore, carefully copy the order in which you ranked the schools on your Test Ticket onto Grid 5.

**Fill in one and only one circle for each school for which you wish to be considered.** You may make as few as one or as many as eight choices. To increase your chances of being assigned to one of the Specialized High Schools, you are encouraged to make more than one choice. You **must** fill in a first choice school. Do not fill in a school more than once. Do not fill in the same school for each choice. Fill in only one circle in a row and only one circle in a column.

**Grid 6** asks for your date of birth. Print the first three letters of the month in the first box, the number of the day in the next box, and the year in the last box. Then fill in the corresponding circles.

In **Grid 7**:

1. Print the name of the school where you are now enrolled in the space at the top of the grid.
2. In the boxes marked “SCHOOL CODE,” print the six-digit code that identifies your school and fill in the circle under the corresponding number or letter for each digit of the school code. (You can find your school code on your Test Ticket. If it is not there, tell the proctor, and the proctor will get the school code for you.)
3. If you attend a private or parochial school, fill in the circle marked “P.”

**Grid 8** is labeled “STUDENT ID NUMBER.” All test-takers should print their student ID number in Grid 8. The student ID number is found on your Test Ticket. In the boxes, print your nine-digit student ID number. Below each box, fill in the circle containing the same number as in the box.

**DO NOT OPEN THIS BOOKLET  
UNTIL YOU ARE TOLD TO DO SO  
TURN YOUR BOOKLET OVER TO THE BACK COVER**

## GENERAL DIRECTIONS, continued

### Identifying Information, continued

**Grid 9** is labeled “BOOKLET LETTER AND NUMBER.” In most cases, Grid 9 is already filled in for you. If it is not, copy the letter and numbers shown in the upper-right corner of your test booklet into the boxes. Below each box, fill in the circle containing the same letter or number as the box.

Now review Side 1 to make sure you have completed all lines and grids correctly. Review each column to see that the filled-in circles correspond to the letters or numbers in the boxes above them.

Turn your answer sheet to Side 2. Print your test booklet letter and numbers, and your name, first name **first**, in the spaces provided.

### Marking Your Answers

Mark each of your answers on the answer sheet in the row of circles corresponding to the question number printed in the test booklet. Use only a Number 2 pencil. If you change an answer, be sure to erase it completely. Be careful to avoid making any stray pencil marks on your answer sheet. Each question has only one correct answer. If you mark more than one circle in any answer row, that question will be scored as incorrect. See the example of correct and incorrect answer marks below.

SAMPLE ANSWER MARKS				
(A)	(B)	(C)	●	RIGHT
(A)	(B)	(C)	(D)	WRONG
(A)	(B)	(C)	(D)	WRONG
(A)	(B)	(C)	(D)	WRONG
(A)	(B)	●	●	WRONG

You can use your test booklet or the provided scrap paper to take notes or solve questions; however your answers must be recorded on the answer sheet in order to be counted. You will not be able to mark your answers on the answer sheet after time is up, and answers left in the test booklet will not be scored.

**DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.**

### Planning Your Time

You have 180 minutes to complete the entire test. How you allot the time between the English Language Arts and Mathematics sections is up to you. **If you begin with the English Language Arts section, you may go on to the Mathematics section as soon as you are ready. Likewise, if you begin with the Mathematics section, you may go on to the English Language Arts section as soon as you are ready.** If you complete the test before the allotted time (180 minutes) is over, you may go back to review questions in either section.

Be sure to read the directions for each section carefully. Each question has only one correct answer. Choose the best answer for each question. When you finish a question, go on to the next, until you have completed the last question. Your score is determined by the number of questions you answer correctly. **Answer every question, even if you may not be certain which answer is correct.** Don't spend too much time on a difficult question. Come back to it later if you have time. If time remains, you should check your answers.

Students must stay for the entire test session.

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# SAMPLE TEST, FORM B

## PART 1 — ENGLISH LANGUAGE ARTS

57 QUESTIONS

### REVISING/EDITING

QUESTIONS 1–9

#### IMPORTANT NOTE

The Revising/Editing section (Questions 1-9) is in two parts: Part A and Part B.

#### REVISING/EDITING Part A

**DIRECTIONS:** Read and answer the following questions. You will be asked to recognize and correct errors so that the sentences or short paragraphs follow the conventions of standard written English. You may write in your test booklet as needed to take notes. You should re-read relevant parts of the sentences or paragraphs, while being mindful of time, before marking the best answer for each question.

1. Read this paragraph.

(1) The blobfish, a creature that certainly resembles its name, is an unusual fish whose body is mostly composed of pink gelatinous flesh. (2) Because it has very few muscles and its density is close to that of water, the blobfish spends its life floating slightly above the ocean floor. (3) It must wait patiently for whatever edible matter might float by its mouth. (4) The blobfish's downturned mouth, slimy skin, and pale coloring caused them to be voted the World's Ugliest Animal in 2013.

Which sentence contains an error in its construction and should be revised?

- A. sentence 1
- B. sentence 2
- C. sentence 3
- D. sentence 4

2. Read this paragraph.

(1) Both Italian gelato and American ice cream are delightful treats to have on a hot summer day, but many people wonder: what is the difference between the two? (2) To start with, the butterfat content is much higher in ice cream than it is in gelato, making the Italian treat a wiser decision for people looking to make healthier choices. (3) Additionally, the mixing process, which adds less air to the frozen treat, makes gelato denser than ice cream. (4) Finally, gelato is served 10 to 15 degrees warmer than ice cream, which enhances the texture and flavor of the gelato, and allow it to melt more quickly.

Which revisions correct the errors in the paragraph?

- E. Sentence 1: Delete the colon after *wonder* AND change *is* to **are**.
- F. Sentence 2: Delete the comma after *with* AND change *it is* to **they are**.
- G. Sentence 3: Delete the comma after *process* AND change *makes* to **make**.
- H. Sentence 4: Delete the comma after *gelato* AND change *allow* to **allows**.

3. Read this paragraph.

In 1967 Katherine Switzer signed up for the Boston Marathon using her first and middle initials instead of her full name, at that time, only men were permitted to officially register and receive a number for the legendary race. Once officials realized a woman was attempting to run in the race, they made efforts to remove her from the competition. Switzer prevailed and finished in just over four hours, paving the way for the official rule change that allowed for the inclusion of women. In 2017, to mark the fiftieth anniversary of this pioneering event, a seventy-year-old Switzer repeated her run, wearing the number 261, the same number she had worn in that first run in 1967.

Which revision corrects the error in sentence structure in the paragraph?

- A. name. At
- B. race. They
- C. hours. Paving
- D. 261. The

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## REVISING/EDITING Part B

**DIRECTIONS:** Read the text below and answer the questions following it. You will be asked to improve the writing quality of the text and to correct errors so that the text follows the conventions of standard written English. You should re-read relevant parts of the text, while being mindful of time, before marking the best answer for each question.

---

### Martial Arts for the Mind and Body

(1) The martial arts blend a series of physical movements with strategic mental discipline so that practitioners can defend themselves, physically defeat an opponent, or both. (2) Historians are unsure of exactly when and where martial arts were first used. (3) Martial arts have been practiced by several different societies for many centuries. (4) Martial arts such as karate, kung fu, tae kwon do, and judo are still taught and practiced as methods of self-defense, but they offer students more than that. (5) The study of martial arts can provide students with a way to enhance their mental discipline as well as their physical fitness.

(6) Discipline, focus, and respect are important qualities for everyone to have. (7) However, for most people these qualities are not innate; they must be learned and practiced. (8) The study of martial arts can provide an opportunity to develop these skills. (9) Students are rewarded for their dedication by passing tests and advancing to higher levels. (10) For example, in a typical tae kwon do class, students learn discipline by diligently practicing moves, improve focus by listening carefully, and demonstrate respect by bowing to the instructor and following directions.

(11) For teenagers, martial arts classes provide a safe and structured environment for gaining physical skills, building confidence, and enjoying a sense of community. (12) A lot of teens go through hard situations as they try to do well in school and in life. (13) A karate class can provide teens with a physical outlet for stress while also challenging them mentally. (14) Participating in a martial arts program also helps children and teens focus on self-improvement rather than on competition. (15) Progressing through levels of achievement involves mastering more physically demanding techniques. (16) It requires students to take responsibility and be accountable for achieving set goals. (17) Students gain confidence and experience companionship with other students who are progressing through the ranks.

(18) Adults who practice martial arts can experience many of the same benefits that younger people do, but perhaps the greatest of these is health and fitness. (19) Adult martial arts students often see changes in their body within weeks of beginning a program.

(20) For people interested in studying a martial art, there are many ways to learn and practice. (21) In addition to private studios, community recreation centers often offer low-cost or free martial arts classes. (22) There are even online videos that introduce students to the basic concepts. (23) People should study martial arts.

4. What is the best way to combine sentences 2 and 3?
- E. Historians, who are unsure of exactly when and where martial arts were first used, know that martial arts have been practiced by several different societies for many centuries.
  - F. While historians are unsure of exactly when and where martial arts were first used, they do know that martial arts have been practiced by several different societies for many centuries.
  - G. Because historians know that martial arts have been practiced by several different societies for many centuries, they are unsure of exactly when and where martial arts were first used.
  - H. Martial arts have been practiced by several different societies for many centuries, and historians are unsure of exactly when and where martial arts were first used.
5. Where should sentence 10 be moved to improve the organization of the second paragraph (sentences 6–10)?
- A. to the beginning of the paragraph (before sentence 6)
  - B. between sentences 6 and 7
  - C. between sentences 7 and 8
  - D. between sentences 8 and 9
6. Which revision of sentence 12 best maintains the formal style established in the passage?
- E. A lot of teens have to put up with difficult things while trying to do well in school and in life.
  - F. Many teenagers deal with tough situations as they try to stay on top of their studies and do well in life.
  - G. Many teenagers encounter challenges as they work to succeed both academically and personally.
  - H. A lot of teens face problems as they work to keep up with their schoolwork and find personal success.
7. Which transitional phrase should be added to the beginning of sentence 17?
- A. Over time
  - B. In fact
  - C. Even so
  - D. For instance

8. Which sentence would best follow and support sentence 18?
- E. Adult students gain discipline, focus, self-control, and respect, which are qualities that help them advance in their careers.
  - F. Many adults initially train in a martial art simply to get exercise without realizing that the training also helps develop other skills.
  - G. The exercise involved in training helps people strengthen their heart, boost endurance, improve balance, and develop muscle tone.
  - H. People who commit to training in the martial arts are usually concerned about improving their overall physical health.
9. Which concluding sentence should replace sentence 23 to best support the topic presented in the passage?
- A. With so many ways to begin studying martial arts, people can easily discover how the skills needed to progress in rank may help them in life.
  - B. By taking advantage of opportunities to practice martial arts, people can experience the satisfaction of achieving goals while also improving themselves.
  - C. Because people are eager to reap the mental and physical benefits of studying martial arts, enrollment in martial arts courses has increased.
  - D. While taking martial arts classes can improve health for both young people and adults, the effects are clearly more immediate for adults.

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# READING COMPREHENSION

## QUESTIONS 10–57

**DIRECTIONS:** Read each of the following six texts, and answer the related questions. You may write in your test booklet as needed to take notes. You should re-read relevant parts of each text, while being mindful of time, before marking the best answer for each question. Base your answers only on the content within the text.

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## The Best Laid Plans of Ravens

- 1 In Edgar Allan Poe’s poem “The Raven,” a raven visits a lonely man’s home and responds to the man’s pleading questions with only the word “nevermore.” The poem’s narrator interprets the word as a prediction of doom for his future. A talking, prophetic raven may seem to be the wild imaginings of the poet, but a new study published in the journal *Science* hints that one particular idea behind the poem might not be as far-fetched as it seems. For most of human history, people assumed that animals do not understand the passage of time in the same way people do. Some people believed that animals might remember events from the past and that instinct might drive them to make preparations in order to guarantee survival, but most people did not think that animals had the ability to plan. At Lund University in Sweden, researchers argue that ravens may be able to think ahead and even plan for the future.
- 2 It can be difficult to test an animal’s ability to plan because human observers must be certain they are not mistaking instinctual behavior for intentional planning. For example, many animals hoard food so that they will not run out later, but scientists who study animals would not call hoarding a decision to plan for the future. This action is merely instinctual. Cognitive scientists argue that in order for an animal’s behavior to qualify as preparing for the future, the animal must use specific decision-making skills to solve a problem.
- 3 To avoid mistaking instinctual behavior for evidence of decision-making, the Lund University researchers designed two experiments to test ravens’ ability to plan. Ravens belong to the corvid family, a group of birds known for their intelligence. A study in 2007 showed that corvids have the tendency to save only certain types of food, which suggests that they are planning for the future rather than acting on instinct. In order to investigate that theory, the researchers had to design experiments that would achieve results that could not be explained by an instinctual behavior of food hoarding. Therefore, the ravens were taught two behaviors that they do not normally perform in the wild.
- 4 For the first experiment, the researchers showed the birds how to use a small stone to open a box and get treats. Once the ravens learned the behavior, the researchers presented the birds with four stones. Only one stone was the right size to open the box. The birds learned to select that stone and set it aside until the researchers presented the box. The second experiment involved bartering. A researcher would trade the ravens a large treat for a bottle cap. Later, the researchers presented the ravens with a group of items, including small treats and the bottle cap. The ravens chose the bottle cap over the treats and waited for the original researcher to trade with them again so that they could get more treats. In both experiments, the ravens waited patiently for up to seventeen hours for the researcher to return.
- 5 The results of these experiments are exciting, but more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future. Some scientists argue that the ravens might be choosing the stone and bottle cap because the ravens have been trained to do so, not necessarily because the ravens are thinking ahead. Regardless, like other recent advances in animal science, these experiments show that ravens could be much smarter than first believed, and scientists now believe that ravens do actually think about their own future.

10. How does paragraph 1 introduce the ideas that ravens may perceive time and plan for the future?
- E. It mentions a poem that considers whether a raven can see the future and then discusses why people have traditionally doubted that ravens have the ability to plan.
  - F. It references a poem about a raven that seems to have insight into the future and then mentions new information that suggests ravens have the ability to plan.
  - G. It mentions a poem that led people to believe that ravens are aware of the future and then explains why scientists want to study ravens' ability to plan.
  - H. It references a poem about a raven that predicts the future and then describes the importance of differentiating ravens' instincts from their ability to plan.

11. Read these sentences from paragraph 2.

**For example, many animals hoard food so that they will not run out later, but scientists who study animals would not call hoarding a decision to plan for the future. This action is merely instinctual.**

Which statement describes the effect of the phrase “merely instinctual” in the passage?

- A. It implies that animals are skilled at finding and saving food for later consumption.
  - B. It conveys that many animals will usually prioritize gathering food over other activities.
  - C. It suggests that animals often store more food than they will be able to consume.
  - D. It emphasizes that many animals collect food automatically rather than with true intention.
12. Read this sentence from paragraph 1.

**At Lund University in Sweden, researchers argue that ravens may be able to think ahead and even plan for the future.**

Which sentence from paragraph 4 provides support for this argument?

- E. “Once the ravens learned the behavior, the researchers presented the birds with four stones.”
- F. “A researcher would trade the ravens a large treat for a bottle cap.”
- G. “Later, the researchers presented the ravens with a group of items, including small treats and the bottle cap.”
- H. “The ravens chose the bottle cap over the treats and waited for the original researcher to trade with them again so that they could get more treats.”

13. In the first experiment described in paragraph 4, which of the ravens' behaviors provides the strongest evidence for the claim that the birds are capable of planning?
- A. They accepted treats from the unlocked box.
  - B. They set aside the stones that would unlock the box.
  - C. They learned which stone could open the box.
  - D. They waited for researchers to bring the box.

14. Read this sentence from paragraph 4.

**In both experiments, the ravens waited patiently for up to seventeen hours for the researcher to return.**

How does this sentence fit into the overall structure of the passage and contribute to the development of ideas?

- E. It concludes the description of the experiments, supporting the idea that ravens can make decisions for the future.
  - F. It establishes the timeline required in experiments designed to determine learned behaviors in ravens.
  - G. It reveals how the ravens solved the problems posed in the experiments, proving that ravens have the ability to plan ahead.
  - H. It indicates that hoarding food is both an instinctual and a learned behavior among ravens.
15. With which statement would the author of the passage most likely agree?
- A. Scientists are unlikely to be able to conduct an experiment that can genuinely distinguish between instinctual and learned behaviors in animals.
  - B. Scientists should continue researching to find more evidence to support the idea that some animals show signs of advanced intelligence.
  - C. Scientists should be careful about making conclusions about animal intelligence based on experiments that rely on training animals.
  - D. Scientists can confirm data on whether animals have the ability to plan by performing experiments on additional species known for their intelligence.

- 16.** How does paragraph 5 fit into the overall structure of the passage and contribute to the development of ideas?
- E.** It introduces a problem with the results of the study at Lund University, suggesting that some scientists believe that further research will not lead to a clear answer.
  - F.** It summarizes the final steps of the study at Lund University, emphasizing the difficulties researchers had in differentiating between true planning and practiced actions.
  - G.** It provides a conclusion to the information about the Lund University study, indicating that some scientists think further research is needed in order to prove the idea.
  - H.** It lists the effects of the study at Lund University, implying that researchers should have designed experiments that better differentiated between planning and instinct.
- 17.** The author conveys a point of view on the study of animal intelligence mainly by
- A.** sharing details about experiments that tested the ability of an animal to plan for the future.
  - B.** comparing the results of different experiments that were designed to test animal intelligence.
  - C.** critiquing experiments that aimed to demonstrate that certain animals are capable of planning for the future.
  - D.** explaining how modern experiments show that previously held beliefs about animal intelligence are inaccurate.

*Located underground near Geneva, Switzerland, the Large Hadron Collider (LHC) helps scientists study and understand how the smallest particles of matter interact with one another. The LHC propels atomic particle beams along a 17-mile-long ring.*

## Looking for the Smallest Spark of Everything

There are the things the world is made of,  
things we can see and feel, and then  
there are the things even smaller, things that seem  
to exist only when we are looking right at them.

5 So beneath the level of molecules are atoms,  
and beneath the level of atoms, we find  
protons, electrons, neutrons; and beneath that—  
what, exactly? Because we are talking about  
everything here: your fingernail,  
10 the candy at the back of your mouth,  
the coffee your teacher drank this morning,  
your little sister, and the stuffed dog  
she used to carry around with her everywhere.  
And everywhere.

15 Everything and everywhere  
are made up of the same stuff, whatever  
it is. How do we find it? We can listen for it  
in the wavelengths from deep space,  
talking back to us from unimaginable  
20 distances. Or we can build long,  
deep circular tunnels beneath the surface  
of this Earth and race particles  
(like racing cars, only very tiny cars  
flashing along at close to the speed of light)  
25 until everything we think we know  
bangs against everything else we know.

And there, in the explosion, in the darkness,  
briefly incandescent, they appear:  
the quarks, the leptons, and the bosons;  
30 the baryons and the mesons. Their names  
sound like dinosaurs or maybe bands  
playing terrible music in someone's garage.

The one thing we know for sure  
is that they spin. This is how gravity  
35 enters our world, how our world is held  
both together and apart, what keeps  
together the pencil in your hand right now  
as well as separate from, say,  
Jupiter. They spin, and it is only down there

40 in the darkness—in the vast garage  
where physicists jot down  
what they can, whatever seems most real—  
that they let us perceive their wild dancing,  
combusting to the music they make.

18. Read lines 5–8 from the poem.

**So beneath the level of molecules are atoms,  
and beneath the level of atoms, we find  
protons, electrons, neutrons; and beneath that—  
what, exactly?**

The lines help develop a central idea of the poem by revealing the speaker's

- E. interest in determining how the parts of matter work together.
  - F. curiosity about what makes up matter.
  - G. desire to prove that particles make up matter.
  - H. questions about what tools are needed to study matter.
19. The break between the second stanza (lines 5–14) and the third stanza (lines 15–26) serves as a transition from
- A. identifying common physical objects to explaining how the particles that make up all physical things are observed.
  - B. suggesting that the visible world is made up of simple materials to revealing why invisible materials make the world complicated.
  - C. discussing the methods used to study particles in space to describing how matter is researched on Earth.
  - D. describing an environment that feels comfortable to characterizing an environment that seems unstable.
20. The main purpose of the comparison in lines 23–24 of the poem is to show
- E. that the particles' size makes them difficult to see.
  - F. how the particles move within the tunnel.
  - G. that the particles have a familiar shape.
  - H. how the particles can be seen only in darkness.

21. Read lines 25–26 from the poem.

**until everything we think we know  
bangs against everything else we know.**

The lines help develop a central idea in the poem by suggesting that

- A. creative methods for researching particles are frequently being invented.
- B. ongoing research continues to add to our knowledge of particles.
- C. our understanding of particles is limited by the equipment available to study them.
- D. competing theories about particles provoke scientific debate.

22. Read lines 27–28 from the poem.

**And there, in the explosion, in the darkness,  
briefly incandescent, they appear:**

The imagery in the lines reveals that the speaker

- E. envies the physicists who research colliding particles.
- F. has personally observed colliding particles.
- G. admires the powerful reactions that occur when particles collide.
- H. has a simplistic understanding of how particles collide.

23. Read lines 30–32 from the poem.

**Their names  
sound like dinosaurs or maybe bands  
playing terrible music in someone’s garage.**

The speaker refers to familiar objects and events in the lines most likely to

- A. explain confusing information in simple terms to help the reader understand more about the topic.
- B. demonstrate how scientific ideas can be explained by describing situations that many people are familiar with.
- C. emphasize that the process being used to research particles is still in the early stages of development.
- D. suggest that the scientific language used to describe particles seems silly by making a humorous comparison.

24. Read lines 36–39 from the poem.

**both together and apart, what keeps  
together the pencil in your hand right now  
as well as separate from, say,  
Jupiter.**

The poet includes these lines most likely to emphasize that

- E. it is important for physicists to continue their research about particles.
  - F. these particles have a powerful effect on everything.
  - G. the discoveries about particles provide little information.
  - H. the study of particles and the study of objects in space are similar.
25. The last stanza (lines 33–44) concludes the poem by emphasizing which central idea?
- A. The exciting work that physicists conduct provides information about fundamental aspects of the universe.
  - B. The unusual work of physicists is carried out in unconventional locations and in special conditions.
  - C. Physicists are learning about the unpredictable behavior of particles that break up matter in the universe.
  - D. Physicists enthusiastically share the discoveries their research yields because most people can relate to their findings.
26. Read lines 39–44 from the poem.

**They spin, and it is only down there  
in the darkness—in the vast garage  
where physicists jot down  
what they can, whatever seems most real—  
that they let us perceive their wild dancing,  
combusting to the music they make.**

The lines reveal the speaker's

- E. frustration with the research facilities physicists use.
- F. belief that physicists are frantically working toward a new discovery.
- G. interest in physicists and their study of particles.
- H. certainty that physicists are working in secrecy.

*In this excerpt, published in 1914, author and professor Dallas Lore Sharp describes a summer cattle roundup in Oregon. The heat and dust had been relentless for three days. The cowboys were exhausted, and the cattle were restless. The ranch boss, Wade, had led the drive to a watering place, only to find it empty.*

## Excerpt from “The Spirit of the Herd”

by Dallas Lore Sharp

- 1 Along with the wagon had come the fresh horses—one of them being Peroxide Jim, a supple, powerful, clean-limbed buckskin, a horse, I think, that had as fine and intelligent an animal-face as any creature I ever saw. Wade had been saving this horse for emergency work. And why should he not have been saved fresh for just such a need as this? Are there not superior horses as well as superior men—a Peroxide Jim to complement a Wade?
- 2 The horse knew the cattle business and knew his rider perfectly; and though there was nothing like sentiment about the boss of the P Ranch riders, his faith in Peroxide Jim was complete. . . .
- 3 The desert, where the herd was camped, was one of the highest of a series of tablelands,<sup>1</sup> or benches; it lay as level as a floor, rimmed by sheer rock, from which there was a drop to the bench of sage below. The herd when overtaken by the dusk had been headed for a pass descending to the next lower bench, but was now halted within a mile of the rim rock on the east, where there was a perpendicular fall of about three hundred feet. . . .
- 4 In the taut silence of the stirless desert night, with the tension of the herd at the snapping-point, any quick, unwonted sight or sound would stampede them. The sneezing of a horse, the flare of a match, would be enough to send the whole four thousand headlong—blind, frenzied, trampling—till spent and scattered over the plain.
- 5 And so, as he rode, Wade began to sing. The rider ahead of him took up the air and passed it on until, above the stepping stir of the hoofs rose the faint voices of the men, and all the herd was bound about by the slow plaintive measures of some old song. It was not to soothe their savage breasts that the riders sang to the cattle, but rather to preempt the dreaded silence, to relieve the tension, and so to prevent the shock of any sudden startling noise.
- 6 So they sang and rode and the night wore on to one o'clock, when Wade, coming up on the rim-rock side, felt a cool breeze fan his face, and caught a breath of fresh, moist wind with the taste of water in it.
- 7 He checked his horse instantly, listening as the wind swept past him over the cattle. But they must already have smelled it, for they had ceased their milling, the whole herd standing motionless, the indistinct forms close to him in the dark showing their bald faces lifted to drink the sweet wet breath that came over the rim. Then they started on again, but faster, and with a rumbling now from their hoarse throats that tightened Wade's grip on the reins.
- 8 The sound seemed to come out of the earth, a low, rumbling mumble, as dark as the night and as wide as the plain, a thick, inarticulate bellow that stood every rider stiff in his stirrups. . . .

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<sup>1</sup>**tablelands:** plateaus, flat areas of land sharply elevated from the surrounding area

- 9 Then the breeze caught the dust and carried it back from the gray-coated, ghostly shapes, and Wade saw that the animals were still moving in a circle. He must keep them going. He touched his horse to ride on with them, when across the black sky flashed a vivid streak of lightning.
- 10 There was a snort from the steers, a quick clap of horns and hoofs from far within the herd, a tremor of the plain, a roar, a surging mass—and Wade was riding the flank of a wild stampede. Before him, behind him, beside him, pressing hard upon his horse, galloped the frenzied steers, and beyond them a multitude borne on, and bearing him on, by the heave of the galloping herd.
- 11 Wade was riding for his life. He knew it. His horse knew it. He was riding to turn the herd, too, back from the rim, as the horse also knew. The cattle were after water—water-mad—ready to go over the precipice to get it, carrying horse and rider with them. Wade was the only rider between the herd and the rim. It was black as death. He could see nothing in the sage, could scarcely discern the pounding, panting shadows at his side. He knew that he was being borne toward the rim, how fast he could not tell, but he knew by the swish of the brush against his tapaderos<sup>2</sup> and the plunging of the horse that the ground was growing stonier, that they were nearing the rocks.
- 12 To outrun the herd was his only chance for life. If he could come up with the leaders he might not only escape, but even stand a chance of heading them off upon the plain and saving the herd. There were cattle still ahead of him; how many, what part of them all, he could not make out in the dark. But the horse knew. The reins hung on his straight neck, where his rider had dropped them, as, yelling and firing over the wild herd, he had given this horse the race to win, to lose.
- 13 They were riding the rim. Close on their left bore down the flank of the herd, and on their right, under their very feet, was a precipice, so close that they felt its blackness—its three hundred feet of fall! . . .
- 14 . . . Then Wade found himself racing neck and neck with a big white steer, which the horse, with marvelous instinct, seemed to pick out from a bunch, and to cling to, forcing him gradually ahead, till, cutting him free from the bunch entirely, he bore him off into the swishing sage.
- 15 The steers coming on close behind followed their leader, and in, after them, swung others. The tide was turning from the rim. More and more were veering, and within a short time the whole herd, bearing off from the cliffs, was pounding over the open plains.
- 16 Whose race was it? It was Peroxide Jim's, according to Wade, for not by word or by touch of hand or knee had the horse been directed in the run. From the flash of the lightning the horse had taken the bit, had covered an indescribably perilous path at top speed, had outrun the herd and turned it from the edge of the rim rock, without a false step or a tremor of fear.

From "The Spirit of the Herd" by Dallas Lore Sharp—Public Domain

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<sup>2</sup>tapaderos: leather covers for stirrups

27. Which sentence from the excerpt best explains why Wade reserved Peroxide Jim for “emergency work” (paragraph 1)?
- A. “Along with the wagon had come the fresh horses—one of them being Peroxide Jim, a supple, powerful, clean-limbed buckskin, a horse, I think, that had as fine and intelligent an animal-face as any creature I ever saw.” (paragraph 1)
  - B. “Before him, behind him, beside him, pressing hard upon his horse, galloped the frenzied steers, and beyond them a multitude borne on, and bearing him on, by the heave of the galloping herd.” (paragraph 10)
  - C. “He knew that he was being borne toward the rim, how fast he could not tell, but he knew by the swish of the brush against his tapaderos and the plunging of the horse that the ground was growing stonier, that they were nearing the rocks.” (paragraph 11)
  - D. “From the flash of the lightning the horse had taken the bit, had covered an indescribably perilous path at top speed, had outrun the herd and turned it from the edge of the rim rock, without a false step or a tremor of fear.” (paragraph 16)
28. Paragraphs 1–2 contribute to the development of the central idea of the excerpt by
- E. revealing the respect Wade had for his horse.
  - F. emphasizing Wade’s high expectations of his horse and himself.
  - G. indicating that Wade and his horse understood the cattle business.
  - H. demonstrating Wade’s ability to gauge a horse’s competence.
29. How does paragraph 3 convey the effect of the setting on the cattle drive?
- A. It shows how the growing darkness created challenges for the riders in getting the herd to move.
  - B. It describes how the changing elevation contributed to the dangerousness of the environment.
  - C. It describes how the desert created a feeling of isolation that caused the riders and the cattle to feel uncomfortable.
  - D. It shows how the steep terrain made it difficult for the cattle to keep moving forward.

30. Which sentence from the excerpt best reveals the mood on the drive before the lightning struck?
- E. “The herd when overtaken by the dusk had been headed for a pass descending to the next lower bench, but was now halted within a mile of the rim rock on the east, where there was a perpendicular fall of about three hundred feet.” (paragraph 3)
  - F. “It was not to soothe their savage breasts that the riders sang to the cattle, but rather to preempt the dreaded silence, to relieve the tension, and so to prevent the shock of any sudden startling noise.” (paragraph 5)
  - G. “So they sang and rode and the night wore on to one o’clock, when Wade, coming up on the rim-rock side, felt a cool breeze fan his face, and caught a breath of fresh, moist wind with the taste of water in it.” (paragraph 6)
  - H. “Then the breeze caught the dust and carried it back from the gray-coated, ghostly shapes, and Wade saw that the animals were still moving in a circle.” (paragraph 9)

31. How does paragraph 9 fit into the overall structure of the excerpt?

- A. It hints at the change in the setting that caused Wade to suddenly become alert.
- B. It creates a false sense of calm that shows how unprepared the men were for what was about to happen.
- C. It indicates that Wade was a skillful leader in unpredictable circumstances.
- D. It presents the incident that caused the main conflict Wade and Peroxide Jim addressed.

32. Read these sentences from the excerpt.

**He was riding to turn the herd, too, back from the rim, as the horse also knew.**  
(paragraph 11)

**It was Peroxide Jim’s, according to Wade, for not by word or by touch of hand or knee had the horse been directed in the run.** (paragraph 16)

How do these sentences develop a central idea in the excerpt?

- E. They suggest that Wade would have been unable to save the herd without Peroxide Jim.
- F. They imply that Wade spent many hours training Peroxide Jim to herd cattle.
- G. They show that Peroxide Jim was able to understand a situation and take action.
- H. They indicate that Peroxide Jim was unafraid of the dangers presented by the stampede and the cliff.

33. Read this sentence from paragraph 13.

**Close on their left bore down the flank of the herd, and on their right, under their very feet, was a precipice, so close that they felt its blackness—its three hundred feet of fall!**

The phrase “bore down the flank of the herd” conveys that Wade

- A. struggled to see the front of the herd.
  - B. had to ride quickly to keep up with the herd.
  - C. was forced to ride between the edge of the cliff and the herd.
  - D. knew that the drop of the cliff would frighten the herd.
34. How do the details in paragraphs 14–16 help convey a central idea of the excerpt?
- E. They highlight Peroxide Jim’s natural ability to control the herd.
  - F. They emphasize the danger of the situation from which Peroxide Jim rescued the herd.
  - G. They show that Peroxide Jim’s physical strength allowed him to force the herd to turn.
  - H. They indicate that Peroxide Jim anticipated the herd’s stampede before the men did.

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# A Memory Revolution

1 A high school senior logs on to a computer at the library to double-check the application due date listed on a college admissions website. Nearby, a librarian helps a group of biology students use a database to search for recent studies about mammals. In the past few decades, the Internet has become an integral component of daily life for many people. The seemingly limitless power of search engines made the Internet search extremely common, and today people increasingly rely on the Internet’s vast accumulation of sources to access all types of information. Scientists are beginning to examine how this reliance is modifying the strategies people use to store and prioritize information in their mind.

## A Dependable and Valuable Asset

- 2 Psychologist Benjamin Storm from the University of California, Santa Cruz, and researchers Sean Stone and Aaron Benjamin devised an experiment to study students’ tendency to depend on the Internet for facts. To begin, the scientists divided sixty participants into multiple groups, including an “Internet” group and a “memory” group, and placed them in front of computers. The Internet group was required to use the search engine Google to answer eight challenging trivia questions. In contrast, participants in the memory group were permitted to use only their personal knowledge to answer the questions. In the second round, the researchers administered notably easier questions. This time, they allowed each group the option of using Google as they answered. Their results showed that 83 percent of the Internet group continued to consult Google in the second round, while only 63 percent of the memory group chose to do so.
- 3 People’s growing inclination to rely on the Internet in order to retrieve information, particularly facts and figures, is called cognitive offloading. Canadian researcher Evan F. Risko and British researcher Sam Gilbert, who have written extensively about the topic, say a similar process has been taking place for centuries. In the past, people used resources like encyclopedias to assist their memories; however, today the Internet, serving as a vast extended memory, allows people to digitally access and retrieve much larger volumes of information. Consequently, people’s minds are free for other cognitive feats, such as connecting data, learning new information, or solving problems.

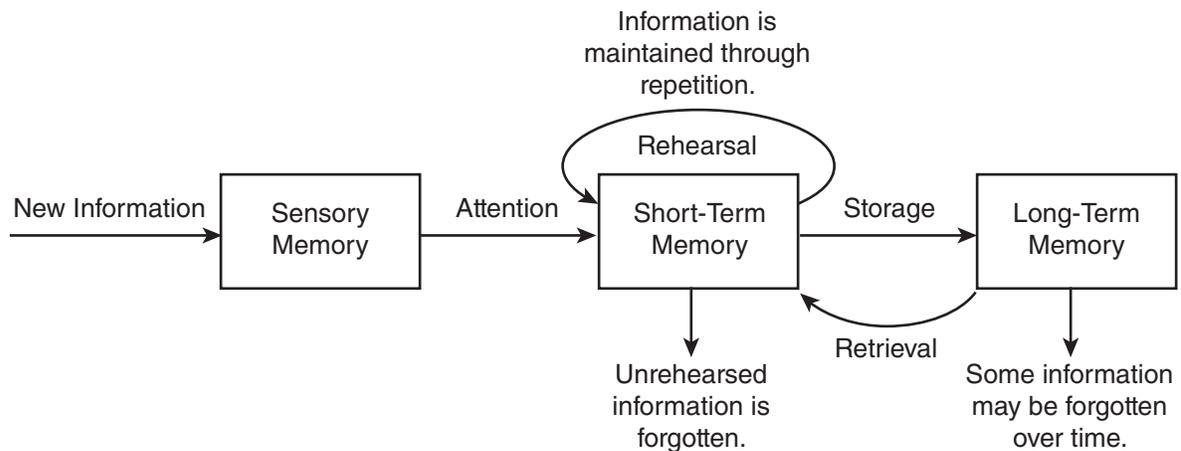
## Filing Information Away

- 4 The use of the Internet also appears to be modifying the strategies people use to store information in their mind. Researchers Betsy Sparrow from Columbia University, Jenny Liu from the University of Wisconsin-Madison, and Daniel Wegner from Harvard University conducted several studies to discover how people efficiently manage their information intake.
- 5 To begin, the researchers examined how people evaluate which information deserves their effort to remember. For this experiment, participants read forty trivia facts, such as “An ostrich’s eye is bigger than its brain,” and typed the statements into a computer file. Half the participants had been previously told the file would be saved, while half believed it would be erased. Next, the participants wrote down every fact they could recall. Those who believed the information would be erased and no longer available could recall 40 percent more facts than those who thought the information would be saved.
- 6 In another experiment, the same researchers tested the ability of study participants to remember where to access information. For this trial, participants read and typed trivia statements, which they

saved in folders with generic names such as “Facts” and “Items.” After spending ten minutes writing down all the facts they could recall from memory, participants were asked which folder contained a particular fact based on a keyword. For example, “Which folder has the fact about ostriches?” Overall, participants recalled the information’s location more often than the content itself, correctly identifying 49 percent of the folders for specific facts while remembering only 23 percent of the actual trivia. The researchers concluded that our memory is adapting to the Internet age by prioritizing where to locate information even when the specific details are forgotten. According to Sparrow, the Internet has become an important form of transactive memory, an external source of the recollections and associative networks that constitute memory.

- 7 As the Internet’s resources continue to expand our “external” memory, some question whether the process may cause people to depend too heavily on technology. However, Steven Pinker, a professor of psychology at Harvard University, says, “Knowledge is increasing exponentially; human brainpower and waking hours are not. Fortunately, the Internet and information technologies are helping us manage, search and retrieve our collective intellectual output at different scales, from Twitter and previews to e-books and online encyclopedias. Far from making us stupid, these technologies are the only things that will keep us smart.”

#### HOW MEMORY WORKS



35. Which sentence from the passage suggests that using Internet search engines may lead people to rely less on their own ability to recall information?
- “In the past few decades, the Internet has become an integral component of daily life for many people.” (paragraph 1)
  - “The Internet group was required to use the search engine Google to answer eight challenging trivia questions.” (paragraph 2)
  - “Their results showed that 83 percent of the Internet group continued to consult Google in the second round, while only 63 percent of the memory group chose to do so.” (paragraph 2)
  - “In the past, people used resources like encyclopedias to assist their memories; however, today the Internet, serving as a vast extended memory, allows people to digitally access and retrieve much larger volumes of information.” (paragraph 3)

36. The details in paragraph 3 about cognitive offloading convey a central idea of the passage by
- E. suggesting that reliance on the Internet for information is inevitable.
  - F. demonstrating how the methods used to store and find information have changed over time.
  - G. explaining how encyclopedias and the Internet are similar sources of information.
  - H. implying that more information can be understood now than ever before.
37. How do the details about the experiment described in paragraph 5 convey a central idea of the passage?
- A. They suggest that the act of repeating information by typing it on a keyboard may improve a person’s memory.
  - B. They explain that a person will forget information faster if the information is considered unimportant.
  - C. They indicate that a person may start to forget details when the amount of information becomes overwhelming.
  - D. They suggest that memory is affected by whether a person expects to have access to the information in the future.
38. The study described in paragraph 6 influenced researchers’ ideas about memory in the digital age by
- E. highlighting instances when organizing detailed information made it easier to remember.
  - F. confirming that keywords can be remembered more easily than large amounts of information.
  - G. identifying a shift in focus from remembering specific information to knowing where to find it.
  - H. emphasizing that remembering a basic idea is more important than storing detailed information.
39. Which evidence from the passage is most relevant to the claim in paragraph 7 that “ ‘far from making us stupid, these technologies are the only things that will keep us smart’ ”?
- A. the revelation that most people opted to use the Internet to answer relatively easy trivia questions rather than relying on their own brainpower (paragraph 2)
  - B. the assertion that the storage of information on the Internet frees people to focus on higher-order tasks such as problem solving (paragraph 3)
  - C. the connection between how people organize information in their mind and their ability to recall that information (paragraph 5)
  - D. the description of transactive memory as an expansive external source that people can use to store information (paragraph 6)

40. Read this sentence from paragraph 7.

**As the Internet’s resources continue to expand our “external” memory, some question whether the process may cause people to depend too heavily on technology.**

How does the sentence contribute to the structure and development of ideas in the passage?

- E. It presents a claim about the risks of relying on the Internet that prompted the research described in paragraphs 2 and 6.
  - F. It contrasts a disadvantage of relying on the Internet with the benefits of Internet use that are described in paragraphs 2 and 6.
  - G. It signals a shift from a neutral viewpoint in paragraphs 2 and 6 to a presentation of an argument and a counterargument.
  - H. It introduces a counterargument and marks a transition from an optimistic tone in paragraphs 2 and 6 to a cautious tone as the counterargument is developed.
41. The effect of the Internet on a person’s memory is illustrated in the passage through the presentation of studies that
- A. examine how the use of search engines changes the way people evaluate and store information for future access.
  - B. highlight the difference between the capacity of the Internet and the ability of the human brain to locate information.
  - C. compare the type of information that can be obtained from the Internet with the type of information that is stored in the human brain.
  - D. emphasize the ease of obtaining information through search engines rather than recalling it from memory.
42. How does the diagram provide additional support for the topic presented in the passage?
- E. It reveals why human brains must adapt to obtaining information from the Internet as opposed to other sources.
  - F. It indicates how people can use the Internet to help improve their long-term recollection of information.
  - G. It shows how study participants’ brains distinguished between important and unimportant details.
  - H. It depicts the idea that repetition and rehearsal are necessary to recall information when tools such as search engines are unavailable.

*The Great Serpent Mound, located in Adams County, Ohio, is a human-made mound of earth that researchers believe was created between 300 B.C. and A.D. 1100 by an indigenous culture.*

## Serpent Mound

Ohio, 1846

Brush Creek stood low when the museum men came  
with their measuring tapes and sketchbooks.

It was winter. Fringed with ice,  
the creek doubled back on itself

5 as if it had forgotten something.

Pa was in Cincinnati, or else on his way home,  
so Ma told me to lead the men  
into the marshy low grounds. It being winter,  
there was little underbrush to speak of—

10 in the summer there would have been

briars, poison ivy, biting flies. I listened  
for the *swish* of a beaver's heavy tail,  
the chitter of a chickadee, or the cry of a hawk,  
but the winter silence of the creek pressed

15 down on all of us like a weight.

The humps in the ground were all but  
invisible until you were right up on them. The figure  
was even less obvious: the sinuous body,  
the tail coiled three times around,

20 and at the other end, the mouth wide open.

In the summer the creek bottom was crowded  
with so much life that you could trip over  
the ridges of earth before you saw  
anything at all. In winter you could climb

25 a tree and get some idea of the whole thing:

the serpent's body undulating, slithering  
silently across the ancient

earth. At the mouth end, there was an oval mound  
as if the snake were about to swallow an egg—

30 as snakes sometimes did in our rickety

henhouse—my Pa always said, or  
as if swallowing the sun, one of the museum  
men suggested, taking notes with his quill pen,  
an old-style inkhorn slung at his side.

35 I liked that: swallowing the sun,

just the sort of thing a snake might do,  
might want to do. When, later, I told my sister Ruth,  
she disagreed. It is singing to the sun,  
she insisted. That is why its mouth

40 is wide open. She said, "Sometimes I think

I hear it on summer nights. Not swallowing, singing."

43. Lines 1–2 contribute to the development of ideas in the poem by
- A. suggesting that the men are too busy with their work to talk to the speaker.
  - B. helping establish the reason for the men’s visit and purposeful behavior.
  - C. hinting that the men have hidden motives for studying the mound.
  - D. indicating why the speaker is fascinated by the men and wants to help them.
44. What impact do the words “*swish*,” “chitter,” and “cry” in lines 12–13 have in the poem?
- E. They illustrate how lively the mound’s surroundings are during the summer.
  - F. They show how the mound disrupts natural life in the marsh.
  - G. They indicate the variety of wildlife found in the area around the mound.
  - H. They suggest that the speaker prefers the mound’s appearance in winter.
45. Which lines reveal how the setting affects the speaker and the men from the museum?
- A. “so Ma told me to lead the men / into the marshy low grounds.” (lines 7–8)
  - B. “It being winter, / there was little underbrush to speak of—” (lines 8–9)
  - C. “but the winter silence of the creek pressed / down on all of us like a weight.” (lines 14–15)
  - D. “The humps in the ground were all but / invisible until you were right up on them.” (lines 16–17)
46. What impact do the phrases “all but / invisible” and “even less obvious” in lines 16–18 have on the meaning of the poem?
- E. They indicate that viewing the full size and shape of the mound is difficult.
  - F. They suggest that the location of the mound is unknown to most people.
  - G. They imply that the speaker wants the location of the mound to remain a secret.
  - H. They reveal that the speaker is unfamiliar with the significance of the mound.
47. Read line 28 from the poem.

**At the mouth end, there was an oval mound**

How does the line contribute to the development of ideas in the poem?

- A. It describes a feature of the mound that the men from the museum need to document.
- B. It introduces a comparison of the body of the mound with the head of the mound.
- C. It introduces a feature of the mound that has a different meaning to different people.
- D. It describes a part of the mound that is difficult to see from far away.

48. The poet contrasts the speaker's and Ruth's points of view regarding the mound by using dialogue to
- E. imply that Ruth knows her interpretation of the mound is abstract.
  - F. indicate that Ruth hopes the men from the museum will agree with her interpretation of the mound.
  - G. suggest that Ruth wants the speaker to agree with her interpretation of the mound.
  - H. show that Ruth has already decided on her interpretation of the mound.
49. How does the poem's form contribute to the poem's meaning?
- A. The use of one continuous stanza and the pattern of the lines mimic the long and winding shape of the mound.
  - B. The uneven line lengths emphasize the variety of ways people interpret the meaning of the mound.
  - C. The dashes throughout the poem highlight the speaker's changing thoughts about the significance of the mound.
  - D. The lack of a regular rhyme scheme and meter convey that the speaker struggles to comprehend the vastness of the mound.
50. How does the speaker's interaction with Ruth in lines 37–41 convey a central idea of the poem?
- E. It suggests that the most accurate interpretations of the mound come from knowing the purpose of the mound.
  - F. It emphasizes that there are multiple interpretations of the mound based on feelings and experiences.
  - G. It reveals the benefit of considering different interpretations of the mound's significance.
  - H. It implies that scientific study of the mound's purpose will affect what the mound symbolizes to people.

CONTINUE ON TO THE NEXT PAGE ►

## Massachusetts: Lowell National Historical Park

- 1 During the first half of the 19th century, Lowell, Massachusetts, quickly transformed itself from a farm town to a bustling industrial city. In time, Lowell became a model of industry, gaining global recognition for its state-of-the-art technology, innovative canal and dam system, mill architecture, boardinghouses, churches, and ethnic neighborhoods. Young Yankee<sup>1</sup> women, immigrant families, and European tourists all flocked to Lowell to find work at one of the many textile mills, or visit the industrious city that was becoming a popular tourist destination. As one Scottish traveler observed during his visit to America, “Niagara<sup>2</sup> and Lowell are the two objects I will longest remember in my American journey, the one the glory of American scenery, the other of American industry.” Today, Lowell National Historical Park welcomes visitors to enjoy the sights of Lowell and learn about the history of one of America’s most significant industrial cities.
- 2 The Boston merchants who founded Lowell in 1821 and named it after Francis Cabot Lowell chose to locate the town along Massachusetts’s Merrimack River to take advantage of the kinetic energy offered by the Pawtucket waterfalls. Over six miles of canals powered the waterwheels of Lowell’s mills, whose massive five- and six-story brick buildings dominated the city’s landscape. . . . The most recognized of these buildings are the Lowell Manufacturing Company chartered in 1821, the Suffolk or Wannalancit Mill completed around the 1880s, the Boott Mill Company established in 1835, and the Boott Mill Boardinghouse that opened in 1838. By the 1850s, 40 textile mills employing over 10,000 workers stretched for about a mile along the river. . . .
- 3 The city’s female workforce was significant in the history of Lowell. From the early to mid-1800s, women left the constricted lifestyle of small rural towns and rural areas for independent industrial city life. Most were young single Yankee girls, who were tired of the limited opportunities offered by their domestic work.<sup>3</sup> Women found that Lowell’s mills offered monthly wages for their services and provided them room and board. Although these women gained economic independence in Lowell, the mill boardinghouse keepers constantly supervised their social activities, for which they hardly had any time, considering their daily 12- to 14-hour work schedules. At the end of the day, the factory bell signaled the “mill girls” to return to their boardinghouses. They were expected to adhere to the strict code of conduct respecting curfew and attending church.
- 4 Yankee “mill girls” continued to dominate the Lowell workforce until the 1840s, when the city began to find it difficult to compete with the growing industrial development in other New England communities. As profits fell, the mill industry cut wages. These wage cuts, deteriorating working conditions, and long workdays led the “mill girls” to protest and organize strikes. When their demands went unheard, the women left Lowell, and immigrant groups replaced them in the workforce. Despite the low wages and unhealthy work conditions, immigrants were eager to find work.
- 5 The immigrants replacing the Yankee “mill girls” during the 1840s were predominantly Irish Catholics, who traveled to America during the Great Potato Famine. Although Lowell received an influx of Irish families during this time, the Irish were a part of the city’s history from its birth, and before the “mill girls” arrived, they built Lowell’s historic canals, mills, and boardinghouses. Initially,

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<sup>1</sup>**Yankee:** native to New England

<sup>2</sup>**Niagra:** a town in northwestern New York State well known as the location of Niagara Falls, a series of waterfalls on the Canadian border

<sup>3</sup>**domestic work:** household duties like cooking and cleaning

Lowell's Protestant community was slow to welcome Irish immigrants, but the hostility between Yankee Protestants and Irish Catholics eventually disappeared. Irish immigrants dominated the industrial scene until the Civil War, when other immigrant groups began to work in the city mills.

- 6 Like the Irish, the French-Canadians, Greeks, Poles, Portuguese, Russian Jews, and Armenians who came to work in Lowell's mills faced long work hours, low wages, and poor living conditions in the city's crowded tenements. By the time Lowell's industry declined, the city had become an ethnic melting pot, where each group claimed its own distinct neighborhood, like the Irish immigrants' "New Dublin" or "Acre," and the French-Canadians' "Little Canada." The city officially began to close down its mills in the 1920s and '30s after Lowell's outdated mills could no longer compete against the state-of-the-art cotton mills in other communities and working conditions continued to decline as Lowell's companies stopped reinvesting in their mills. . . . Despite a brief resurgence during World War II, the city shut down its last surviving mill by the mid-1950s.

From "Massachusetts: Lowell National Historical Park"—Public Domain/National Park Service

51. Read this sentence from paragraph 1.

**As one Scottish traveler observed during his visit to America, "Niagara and Lowell are the two objects I will longest remember in my American journey, the one the glory of American scenery, the other of American industry."**

The author most likely includes the quotation from the Scottish traveler in order to

- A. suggest that people around the world saw the direct contribution of nature and industry to the United States.
  - B. compare the natural and industrial attractions in the United States at that time.
  - C. convey the idea that the United States offered both natural and industrial attractions.
  - D. imply that the natural resources in the United States contributed to the development of industry.
52. Which sentence from paragraph 2 best supports the idea that Lowell became "a bustling industrial city" (paragraph 1)?
- E. "The Boston merchants who founded Lowell in 1821 and named it after Francis Cabot Lowell chose to locate the town along Massachusetts's Merrimack River to take advantage of the kinetic energy offered by the Pawtucket waterfalls."
  - F. "Over six miles of canals powered the waterwheels of Lowell's mills, whose massive five- and six-story brick buildings dominated the city's landscape."
  - G. "The most recognized of these buildings are the Lowell Manufacturing Company chartered in 1821, the Suffolk or Wannalancit Mill completed around the 1880s, the Boott Mill Company established in 1835, and the Boott Mill Boardinghouse that opened in 1838."
  - H. "By the 1850s, 40 textile mills employing over 10,000 workers stretched for about a mile along the river."

53. Read this sentence from paragraph 3.

**From the early to mid-1800s, women left the constricted lifestyle of small rural towns and rural areas for independent industrial city life.**

Which statement best describes how the sentence fits into the overall structure of the passage?

- A. It provides a transition from a description of the mills to a description of the workforce in those mills.
- B. It indicates a shift in tone from positive and hopeful to negative and dissatisfied with working conditions at the mill.
- C. It presents the circumstances that led many women to leave their hometown and move to the city for work.
- D. It begins a comparison of the mill workforce between the mid-1800s and the late 1800s.

54. Which sentence best summarizes the mill girls' time as the dominant workforce in Lowell?

- E. The mill girls were eager to leave their domestic duties and small towns behind, so they went to work in the mills of Lowell.
- F. Originally, the mill girls were satisfied to work in Lowell, but as they left their jobs at the Lowell mills, immigrants arrived to fill the empty positions.
- G. Young women left home to work in the Lowell mills, but the mill girls soon became dissatisfied with the working conditions and rigid boardinghouse rules.
- H. The mill girls embraced city life when they came to work in Lowell's mills, but when the working conditions became unfavorable and the mill girls' protests went unanswered, they left.

55. Read this sentence from paragraph 5.

**Although Lowell received an influx of Irish families during this time, the Irish were a part of the city's history from its birth, and before the "mill girls" arrived, they built Lowell's historic canals, mills, and boardinghouses.**

How does this sentence contribute to the development of ideas in the passage?

- A. It implies that Lowell was founded by early Irish immigrants.
- B. It emphasizes the important role Irish immigrants played in Lowell's history.
- C. It suggests that the new Irish immigrants were readily accepted into the community.
- D. It highlights the working relationship between the mill girls and the new Irish immigrants.

- 56.** A central idea that Lowell was “one of America’s most significant industrial cities” (paragraph 1) is conveyed in the passage primarily through a description of the
- E.** canals, mills, and boardinghouses that were built by immigrants.
  - F.** mill girls and immigrants who comprised Lowell’s workforce.
  - G.** development of the mills and the workforce established to support them.
  - H.** cultural diversity of the people who lived in the area.
- 57.** The reason Lowell lost its status as an industrial leader is best illustrated through the
- A.** description of poor living and working conditions.
  - B.** explanation for why some immigrant groups struggled to live together.
  - C.** comparison with other mills that used modern methods.
  - D.** information about the mills opening temporarily during World War II.

# PART 2 — MATHEMATICS

57 QUESTIONS

## IMPORTANT NOTES

- (1) Formulas and definitions of mathematical terms and symbols are **not** provided.
  - (2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be determined from the information given.
  - (3) Assume that a diagram is in one plane unless the question specifically states that it is not.
  - (4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, lines on a graph that appear to be parallel can be assumed to be parallel. This is also true for concurrent lines, straight lines, collinear points, right angles, etc.
  - (5) Reduce (simplify) all fractions to lowest terms.
- 

CONTINUE ON TO THE NEXT PAGE ►

# GRID-IN QUESTIONS

## QUESTIONS 58–62

**DIRECTIONS:** Solve each question. On the answer sheet, write your answer in the boxes at the top of the grid. Start on the left side of each grid. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above. **DO NOT FILL IN A CIRCLE UNDER AN UNUSED BOX. DO NOT LEAVE A BOX BLANK IN THE MIDDLE OF AN ANSWER.**

58.

LAST YEAR'S  
TOTAL SALES

Vehicles	Number
Four-door cars	5,850
Two-door cars	2,250
Trucks	900
<b>Total</b>	<b>9,000</b>

The table above shows the number of each type of vehicle sold at a dealership last year. If 1,000 vehicles will be sold next month, what is the best estimate (based on last year's sales) of the number of two-door cars that will be sold?

59. In a scale drawing of a rectangular garden, the length is 15 inches and the width is 9 inches. In the drawing, 2 inches represents 3 yards. What is the width of the actual garden, in yards?

60. A kindergarten teacher has 72 crayons, 60 pencils, and 84 sheets of paper to distribute to the children in her class. If each child receives an equal number of each item and there are no items remaining, what is the greatest possible number of children in the class?

61. Mr. Smith opened a retirement account with a deposit of \$900. This account earns 5% simple interest annually. How many years will it take for his \$900 deposit to earn \$360 interest?

62. Solve the equation for  $x$ :

$$\frac{(21)(14)x}{(49)(48)} = 0.875$$

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# MULTIPLE CHOICE QUESTIONS

## QUESTIONS 63–114

**DIRECTIONS:** Solve each question. Select the best answer from the choices given. Mark the letter of your answer on the answer sheet. When you are solving questions, you can write in the test booklet or on the scrap paper given to you.

---

**63.** Two glasses can hold the same amount of liquid. Glass A is  $\frac{1}{2}$  filled, and Glass B is  $\frac{1}{3}$  filled. If the liquid in Glass B is poured into Glass A, what fraction of Glass A will then be filled?

- A.  $\frac{5}{6}$
- B.  $\frac{4}{5}$
- C.  $\frac{3}{4}$
- D.  $\frac{1}{5}$

**64.** On Fran's map, 2 centimeters represents 3 kilometers. The points on this map that represent Fran's home and Bryant State Park are 4.5 centimeters apart. How many kilometers apart are Fran's home and Bryant State Park, to the nearest kilometer?

- E. 3
- F. 5
- G. 7
- H. 9

**65.** Solve for  $x$  in terms of  $y$  if  $2x + 4 = y$ .

- A.  $x = \frac{y - 4}{2}$
- B.  $x = 2(y + 4)$
- C.  $x = \frac{y + 4}{2}$
- D.  $x = 2(4 - y)$

**66.** Bryan completed a 100-meter race in 11.74 seconds. Luis completed the same race in 11.69 seconds. What was the difference between their times, expressed as a fraction of a second?

- E.  $\frac{1}{20}$
- F.  $\frac{1}{10}$
- G.  $\frac{3}{20}$
- H.  $\frac{1}{5}$

**67.** A recipe uses  $\frac{1}{4}$  teaspoon of salt and  $2\frac{1}{2}$  teaspoons of sugar. What is the ratio of salt to sugar in this recipe?

- A. 1:20
- B. 1:10
- C. 1:5
- D. 1:4

68.  $n = 0.13 + \frac{207}{100}$
- What is the value of  $n$  expressed as a fraction?

- E.  $\frac{1}{3}$
- F.  $\frac{11}{5}$
- G.  $\frac{9}{4}$
- H.  $\frac{23}{10}$

69. The perimeter of a 12-sided polygon is 100 centimeters. The length of one side is 25 centimeters. The length of another side is 35 centimeters. The remaining sides are equal in length to one another. What is the length of each of the remaining sides, in centimeters?

- A. 4
- B. 5
- C. 20
- D. 40

70. Shioh-Chen has a box that contains 4 green cards, 7 yellow cards, and 6 red cards. She randomly draws one card at a time from the box and does not return the cards to the box after they have been drawn. The first card she draws is yellow. The second card she draws is green. What is the probability that the third card she draws will also be green?

- E.  $\frac{1}{5}$
- F.  $\frac{4}{17}$
- G.  $\frac{1}{4}$
- H.  $\frac{1}{3}$

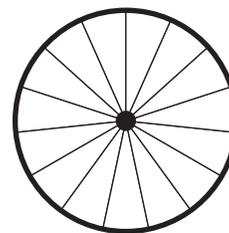
71. Each number in a sequence is 3 more than twice the number that comes just before it. If 93 is a number in the sequence, what number comes just before it?

- A. 92
- B. 90
- C. 48
- D. 45

72. On a map, the distance between Deshawn's house and Xin's house is 5.4 inches. If 2 inches on the map represents 3 miles, what is the distance between these two houses, in miles?

- E. 2.6
- F. 3.6
- G. 7.5
- H. 8.1

73.



This wheel has 15 spokes, equally spaced. What is the measure of the angle between adjacent spokes?

- A.  $30^\circ$
- B.  $24^\circ$
- C.  $15^\circ$
- D.  $12^\circ$

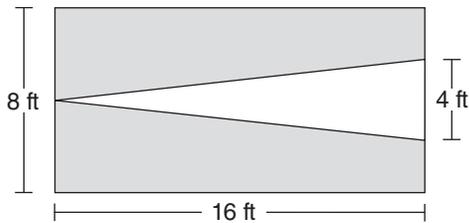
74.

$$m \cdot t = 72$$

For the equation above, what is the sum of the values of  $m$  when  $t = 1$ , when  $t = 2$ , and when  $t = 3$ ?

- E. 12
- F. 72
- G. 132
- H. 135

75.



The diagram above shows a rectangle with an inscribed triangle. The triangle's vertex and base touch the sides of the rectangle as shown. What is the total area of the shaded portion?

- A. 32 sq ft
- B. 64 sq ft
- C. 96 sq ft
- D. 128 sq ft

76. Orange juice costs \$2 per gallon, and grapefruit juice costs \$3 per gallon. A recent shipment of equal amounts of the two types of juice costs a total of \$250. How many gallons of orange juice are in the shipment?

- E. 50
- F. 62.5
- G. 100
- H. 125

77. Five consecutive numbers have a sum of 110. What is the **least** of these consecutive numbers?

- A. 11
- B. 18
- C. 20
- D. 22

78.

$$\begin{aligned} & -mn \\ & (-m)(-n) \\ & |mn| \\ & |-mn| \\ & |(-m)(-n)| \end{aligned}$$

If  $m$  and  $n$  are positive integers, how many of the five expressions above are equivalent to  $mn$ ?

- E. 1
- F. 2
- G. 3
- H. 4

79.

$$\frac{5^4 \times 5^6}{5^2} =$$

- A.  $5^8$
- B.  $5^{10}$
- C.  $5^{12}$
- D.  $5^{22}$

80.

FRUIT SOLD AT  
STORE XYZ

Fruit	Number Sold
Apples	8
Bananas	6
Cherries	12
Oranges	6
Peaches	?
<b>Total</b>	<b>50</b>

Peaches made up what percentage of the total number of pieces of fruit sold at Store XYZ, according to the table above?

- E. 18%
- F. 28%
- G. 36%
- H. 64%

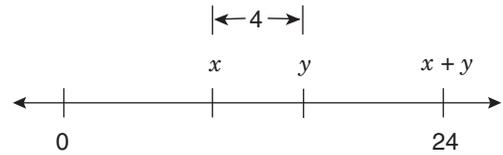
81. Carpenters laid a layer of insulation 6 inches thick to cover a rectangular attic floor that was 32 feet long and 20 feet wide. What was the volume, in cubic feet, of the insulation used to cover the floor?

- A. 160
- B. 320
- C. 640
- D. 3,840

82. The town of Waterville covers an area of 50 square miles. In 2005, its population was 84,000. In 2006, its population had decreased so that the average population per square mile was equal to 1,500. What was the total decrease in population from 2005 to 2006?

- E. 7,500
- F. 8,400
- G. 9,000
- H. 9,200

83.



According to the number line above, what is the value of  $y$ ?

- A. 4
- B. 12
- C. 14
- D. 20

84.  $N = \{6, 7, \dots, 21, 22\}$

Set L (not shown) is a list of 25 consecutive integers. The median of the integers in set N above is equal to the least integer in set L. What is the median of the integers in set L?

- E. 25
- F. 26
- G. 27
- H. 28

85. The sum of the numbers  $x$ ,  $y$ , and  $z$  is 40. The ratio of  $x$  to  $y$  is 1:2, and the ratio of  $y$  to  $z$  is 2:5. What is the value of  $y$ ?

- A. 2
- B. 4
- C. 8
- D. 10

86. Which number could be the sum of 4 consecutive integers?

E. -12  
F. -10  
G. -8  
H. -4

87.

PRICE OF A VIDEO GAME AT  
VARIOUS STORES

Price of Video Game	Number of Stores
\$10.99	5
\$11.99	2
\$12.99	1
\$13.99	4

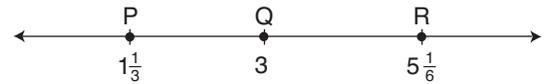
The table above shows the price of a certain video game at 12 different stores. What is the median price of this video game?

A. \$10.99  
B. \$11.49  
C. \$11.99  
D. \$12.32

88. If  $xy = 30$ , what is the value of  $10 \div x$  in terms of  $y$ ?

E.  $\frac{1}{10}y$   
F.  $\frac{1}{3}y$   
G.  $3y$   
H.  $10y$

89.



On the number line above, how many units longer is  $\overline{QR}$  than  $\overline{PQ}$ ?

A.  $\frac{1}{6}$   
B.  $\frac{1}{2}$   
C.  $\frac{2}{3}$   
D. 3

90.



The distance from W to X is 70% of the distance from W to Y. If the distance from X to Y is 15 miles, what is the distance, in miles, from W to X?

E. 10.5  
F. 35  
G. 45  
H. 50

91. There are 3 different highways from City W to City X, 4 different highways from City X to City Y, and 3 different highways from City Y to City Z. How many different routes are there for a trip from City W to City X to City Y to City Z?

A. 10  
B. 12  
C. 24  
D. 36

92. In Center City, the ratio of people to dogs is 4:1, and the ratio of dogs to cats is 3:2. What is the ratio of people to cats?

- E. 2:1
- F. 7:3
- G. 6:1
- H. 12:1

93. The side length of square S is shorter than the side length of square T by 1 centimeter. The area of square S is 9 square centimeters. What is the difference, in square centimeters, between the area of square T and the area of square S?

- A. 3
- B. 7
- C. 8
- D. 10

94. If  $x$  is an odd number, what is the sum of  $x$  and the next 2 odd numbers greater than  $x$ ?

- E.  $x + 4$
- F.  $2x + 6$
- G.  $3x + 3$
- H.  $3x + 6$

95. How is  $\frac{1}{x} - \frac{1}{2x}$  written as a single fraction?  
(Assume  $x \neq 0$ .)

- A.  $\frac{1}{2x}$
- B.  $\frac{1}{3x}$
- C.  $-\frac{1}{x}$
- D.  $-\frac{1}{2x}$

96. In a certain competition, 1 person finished in first place, 5 people tied for second place, 10 people tied for third place, and the other 4,984 people did not place. What percentage of the people in the competition placed first, second, or third altogether?

- E. 0.0032%
- F. 0.032%
- G. 0.32%
- H. 3.2%

97. Angle A and angle B are complementary. If the measure of angle B is three times as great as the measure of angle A, what is the measure of angle B?

- A.  $45^\circ$
- B.  $67.5^\circ$
- C.  $75^\circ$
- D.  $135^\circ$

98. The height of a tree in 2013 is 300% of the height it was in 2003. By what percentage did its height increase over this ten-year period?

- E.  $33\frac{1}{3}\%$
- F. 100%
- G. 200%
- H. 300%

99. 1 gallon = 16 cups  
1 cup = 8 fluid ounces

If 1 gallon =  $2^x$  fluid ounces, what is the value of  $x$ ?

- A. 4
- B. 7
- C. 8
- D. 64

100. A certain square puzzle has an area of 64 square inches, and a cubic block has a volume of 64 cubic inches. What is the ratio of the length of a side of the puzzle to the length of a side of the block?

- E. 1:3
- F. 1:2
- G. 2:3
- H. 2:1

101. In a certain class, Rosa will take a total of 4 tests. She has already taken 2 of the tests and earned scores of 81 and 83. What is the **least** possible score Rosa can earn on the third test and still be able to finish the class with an average score of 85 on all 4 tests? (Assume that test scores can range from 0 to 100.)

- A. 76
- B. 82
- C. 88
- D. 90

102. The Barnes family and the Ramirez family each have a pizza of equal size. The first pizza is cut into 18 equal slices, and the second pizza is cut into 15 equal slices. If the Barnes family eats 11 slices from the first pizza, what is the greatest number of whole slices from the second pizza that the Ramirez family can eat without eating a greater percentage of a pizza than the Barnes family ate?

- E. 6
- F. 7
- G. 8
- H. 9

103.  $0^3 + 4^0 + 2^{-1} + (-1)^2$

What is the value of the expression above, in decimal form?

- A. 0
- B. 0.5
- C. 1.5
- D. 2.5

104. A company wants to study 6 brands of soap by comparing each brand with every other brand. If each comparison costs \$2,000, how much will the company spend altogether?

- E. \$13,000
- F. \$20,000
- G. \$30,000
- H. \$60,000

105. What number is halfway between  $\frac{1}{20}$  and  $\frac{1}{10}$  on a number line?

- A.  $\frac{1}{5}$
- B.  $\frac{2}{15}$
- C.  $\frac{1}{30}$
- D.  $\frac{3}{40}$

106. A rectangular swimming pool of uniform depth is 20 yards long and 14 yards wide. If the water is 6 **feet** deep, what is the volume of water in the pool, in cubic yards?

- E. 40
- F. 286
- G. 560
- H. 1,680

107.

{3, 4, 5, 6, 7}

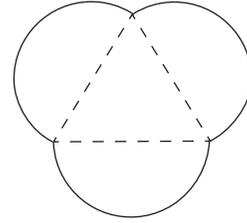
A student made a list of all possible products of 2 **different** numbers in the set above. What fraction of the products are odd?

- A.  $\frac{3}{20}$
- B.  $\frac{3}{10}$
- C.  $\frac{1}{2}$
- D.  $\frac{3}{5}$

108. A number,  $n$ , is divided by 25. If the quotient is 10 with a remainder of 5, what is the quotient expressed as a decimal?

- E. 10.20
- F. 10.25
- G. 10.50
- H. 10.75

109.



The garden design shown above is created in the shape of three semicircles whose diameters lie on the sides of an equilateral triangle. If each diameter is 2 meters long, what is the perimeter of the garden, in meters?

- A. 6
- B. 12
- C.  $3\pi$
- D.  $6\pi$

110. Micha is playing a game with five cards numbered 1 through 5. He will place the cards in a bag and draw one card at random three times, replacing the card each time. To win a prize, he must draw the number 5 all three times. What is the probability he will draw the number 5 all three times?

- E.  $\frac{1}{125}$
- F.  $\frac{3}{125}$
- G.  $\frac{1}{15}$
- H.  $\frac{3}{5}$

111. The speed 10 meters per second is equivalent to how many feet per hour? (Use the approximation 1 foot = 0.3 meter.)

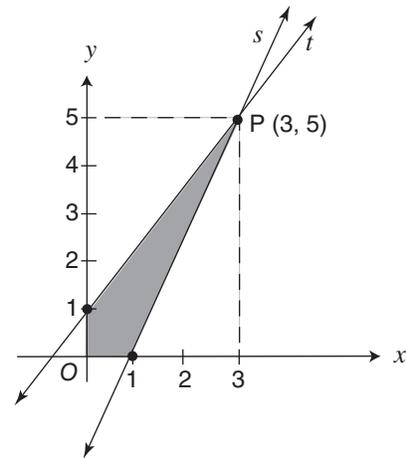
- A. 10,800
- B. 12,000
- C. 36,000
- D. 120,000

112.  $6.\overline{34} - 4.\overline{12}$

What is the value of the expression above, written as an improper fraction?

- E.  $\frac{24}{11}$
- F.  $\frac{224}{101}$
- G.  $\frac{111}{50}$
- H.  $\frac{20}{9}$

113.



Lines  $s$  and  $t$  intersect at point  $P(3, 5)$ . What is the area, in square units, of the shaded region in the graph above?

- A. 2
- B. 3
- C. 4
- D. 7

114. A box contains 14 red marbles, 10 black marbles, and 16 white marbles. How many more white marbles need to be added to the box so that the probability of randomly drawing a white marble is  $\frac{3}{5}$ ?

- E. 8
- F. 10
- G. 14
- H. 20

## REVISING/EDITING PART A

1. The question asks for the identification of the sentence that contains an error in its construction and should be revised.

**D: Correct.** Sentence 4 contains an error because the sentence uses the plural pronoun “them” to refer to “The blobfish’s,” which is singular in number. The word “them” should be changed to “it.” The paragraph refers to the blobfish as a singular species in each of its four sentences, and sentence 4 should be revised to match.

**A: Incorrect.** There are no errors in sentence 1. The singular pronoun “its” matches the number of the word it refers to, the singular noun “blobfish.” Additionally, the clause “a creature that certainly resembles its name,” is correctly set off by commas to provide an additional, but not essential, detail about the blobfish.

**B: Incorrect.** There are no errors in sentence 2. The singular pronoun “its” matches the number of the word it refers to, the singular noun “blobfish.” Additionally, the structure of the sentence correctly shows that the clause “Because it has very few muscles and its density is close to that of water” modifies the words “the blobfish.”

**C: Incorrect.** There are no errors in sentence 3. The “it” in the sentences refers to “the blobfish” mentioned in the previous sentence. The use of singular pronouns in sentence 3 is consistent with the rest of the paragraph.

2. The question asks for the revisions that are needed to correct errors in the paragraph.

**H: Correct.** Deleting the comma after “gelato” would include the clause “and allow it to melt more quickly” with the first part of the clause “which enhances the texture and flavor of the gelato.” In this clause, the word “and” indicates that the two verb phrases (“enhances the texture and flavor of gelato” and “allow it to melt more quickly”) share a subject, “which” (referring to the act of serving gelato 10 to 15 degrees warmer than ice cream). The two ideas should not be separated by a comma within the clause. The entire clause “which enhances the texture and flavor of the gelato and allow it to melt more quickly” should be separated from the main clause only by the comma after “cream” because the entire clause is a nonrestrictive clause. This clause provides additional, but not essential, information about the purpose of serving gelato at a warmer temperature than when serving ice cream. Changing the verb “allow” to “allows” is also necessary to match the use of the singular noun “gelato,” which is the subject of the sentence.

**E: Incorrect.** The revisions in Option E introduce new errors. The colon after “wonder” is needed to set off the question “what is the difference between the two?” from the rest of the sentence. In addition, changing the verb “is” to “are” would be incorrect with the use of the singular noun “difference,” which is the subject of the question, “what is the difference between the two?”

**F: Incorrect.** The revisions in Option F introduce new errors. The comma following the introductory phrase “To start with” helps with clarity and is needed to separate the phrase from the rest of the sentence. Changing “it is” to “they are” would be incorrect with the use of the singular noun “butterfat content,” which is what the words “it is” refer to in the sentence.

**G: Incorrect.** The revisions in Option G introduce new errors. The comma following “process” is necessary to set off the nonrestrictive clause “which adds less air to the frozen treat” from the rest of the sentence. This

clause is considered a nonrestrictive clause because it provides additional, but not essential, information about the mixing process. Changing the verb “makes” to “make” would be incorrect with the use of the singular noun “mixing process,” which is the subject of the sentence.

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3. The question asks for the revision that corrects the error in sentence structure in the paragraph.

**A: Correct.** As written, the first sentence (“In 1967 Katherine Switzer . . . legendary race.”) is a run-on sentence because a comma is used to combine two independent clauses. Independent clauses are complete sentences with a subject and a verb. The clauses—“In 1967 Katherine Switzer signed up for the Boston Marathon using her first and middle initials instead of her full name” and “at that time, only men were permitted to officially register and receive a number for the legendary race”—should be separated with a period instead. The revision in Option A correctly places a period after the word “name” and capitalizes the word “At” to separate the two independent clauses into two sentences.

**B: Incorrect.** The revision in Option B introduces an error into the paragraph and does not revise the run-on in the first sentence. The clause “Once officials realized a woman was attempting to run in the race” is a modifying phrase that provides information about “they” (which refers to the “officials”). The phrase cannot stand alone without the rest of the sentence. Changing the comma after the word “race” to a period would incorrectly separate the phrase from the rest of the sentence.

**C: Incorrect.** The revision in Option C introduces an error into the paragraph and does not revise the run-on in the first sentence. The sentence “Switzer prevailed and finished in just over four hours, paving the way for the official rule change that allowed for the inclusion of women” is a complex sentence, which combines an independent clause (“Switzer prevailed and finished in just over four hours”) and a dependent clause (“paving the way for the official rule change that allowed for the inclusion of women”). The clause “paving the way for the official rule change that allowed for the inclusion of women” is not a complete sentence and must stay connected to the first part of the sentence. Changing the comma after “hours” to a period would incorrectly separate the dependent clause from the rest of the sentence.

**D: Incorrect.** The revision in Option D introduces an error into the paragraph and does not revise the run-on in the first sentence. Changing the comma after “261” to a period would incorrectly separate the modifying clause “the same number she had worn in that first run in 1967” from the words it describes (“number 261”). Additionally, the clause “the same number she had worn in that first run in 1967” is not a complete sentence.

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## REVISING/EDITING PART B

### Martial Arts for the Mind and Body

4. The question asks for the best way to combine sentences 2 and 3.

**F: Correct.** Option F is correct because the word “while” at the beginning of the sentence best indicates the contrast between the ideas in sentences 2 and 3. Sentence 2 states that historians do not know the exact origins of martial arts (“unsure of exactly when and where”). Sentence 3 describes what historians do know about these origins (“practiced by several different societies for many centuries”). This combination indicates that historians have a general understanding about the origins of martial arts even though they cannot confirm the exact details.

**E: Incorrect.** This way of combining sentences 2 and 3 places unnecessary emphasis on characterizing historians, and it does not clearly show the contrasting relationship between the idea from sentence 2 that historians do not know the exact origins of martial arts and the idea in sentence 3 that historians know that martial arts have a long history.

**G:** Incorrect. Starting this sentence with the word “because” indicates a cause-and-effect relationship that does not exist between the ideas in the original sentences. The idea from sentence 3, that historians know that martial arts have been practiced for many years, did not cause the idea in sentence 2, that historians do not know exact details about the origins of martial arts.

**H:** Incorrect. The conjunction (connecting word) “and” does not clearly show how the ideas in sentences 2 and 3 are related. While “and” can be used to combine related sentences, it does not demonstrate the contrast between the idea in sentence 2, that historians do not know the exact origins of martial arts, and the idea in sentence 3, that historians know that martial arts have a long history.

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5. The question asks where sentence 10 should be moved to improve the organization of the second paragraph.

**D: Correct.** Option D is correct because sentence 10 logically follows and supports the idea in sentence 8 that “the study of martial arts can provide an opportunity to develop” the qualities of discipline, focus, and respect. Sentence 10 explains this idea with examples, describing three specific ways that students in a typical tae kwon do class develop discipline, focus, and respect—by “diligently practicing,” “listening carefully,” and “bowing to the instructor and following directions.”

**A:** Incorrect. Starting this paragraph with sentence 10 would weaken the paragraph’s organization because it would place a supporting detail sentence (sentence 10) before the topic sentence (sentence 6). Sentence 6 belongs at the beginning of the paragraph because it introduces the topic—the qualities of discipline, focus, and respect. Sentence 10 supports the key idea of the paragraph, that these qualities can be developed through the study of martial arts. If sentence 10 preceded sentence 6, the transitional phrase “for example” would refer to an unspecified topic and idea.

**B:** Incorrect. Sentence 6 presents the idea that “discipline, focus, and respect are important qualities for everyone to have,” but the example in sentence 10 does not directly relate to this idea. Sentence 10 explains how martial arts develop these qualities, not why they are important qualities to have. Because sentence 10 is not directly related to the idea in sentence 6 (the qualities are important), it should not follow sentence 6.

**C:** Incorrect. Sentences 7 and 8 should not be separated, because the idea presented in sentence 8—that “the study of martial arts can provide an opportunity to develop these skills”—is directly related to the idea from sentence 7—that the skills of discipline, focus, and respect “are not innate; they must be learned and practiced.” Sentence 10 supports the idea from sentence 8 that martial arts “can provide an opportunity to develop these skills” by describing an example from a typical martial arts class, so sentence 10 should not precede sentence 8.

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6. The question asks for the revision of sentence 12 that best maintains the formal style established in the passage.

**G: Correct.** Option G is correct because it uses serious and academic wording throughout the whole sentence. The phrases “many teenagers,” “encounter challenges,” and “succeed both academically and personally” make the sentence’s style more consistently formal than the other options.

**E:** Incorrect. The phrases “A lot,” “put up with,” “difficult things,” and “do well in school” are worded informally; therefore, this sentence does not consistently maintain the formal style established in the passage.

**F:** Incorrect. The phrases “deal with,” “tough situations,” “stay on top of,” and “do well in life” are worded informally; therefore, this sentence does not consistently maintain the formal style established in the passage.

**H:** Incorrect. The phrases “A lot,” “face problems,” and “keep up with” are worded informally; therefore, this sentence does not consistently maintain the formal style established in the passage.

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7. The question asks for the transitional phrase that should be added to the beginning of sentence 17.

**A: Correct.** Option A is correct because it best shows the chronological progression between the ideas in sentence 16—progressing through levels of achievement “requires students to take responsibility and be accountable for achieving set goals”—and the ideas in sentence 17—“students gain confidence and experience companionship with other students who are progressing through the ranks.” The transitional phrase “over time” shows the gradual nature of the relationship between the cause in sentence 16 and the effect in sentence 17.

**B:** Incorrect. Though the ideas in sentences 16 and 17 are related, “in fact” does not show the correct relationship between the ideas. The transitional phrase “in fact” emphasizes an idea by giving a detail or example of greater intensity, but the ideas in sentence 16—progressing through levels “requires students to take responsibility and be accountable for achieving set goals”—and the ideas in sentence 17—“students gain confidence and experience companionship with other students who are progressing through the ranks”—are related by cause-and-effect rather than by (degree of) intensity.

**C:** Incorrect. The transitional phrase “even so” is used to connect opposing ideas, but the ideas in sentence 16—progressing through levels “requires students to take responsibility and be accountable for achieving set goals”—does not contrast with the ideas in sentence 17—“students gain confidence and experience companionship with other students who are progressing through the ranks.”

**D:** Incorrect. Although the transitional phrase “for instance” connects an idea with a related example, it does not show the cause-and-effect relationship between the ideas in sentence 16—progressing through levels “requires students to take responsibility and be accountable for achieving set goals”—and the ideas in sentence 17—“students gain confidence and experience companionship with other students who are progressing through the ranks.”

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8. The question asks for the sentence that would best follow and support sentence 18.

**G: Correct.** Option G is correct because sentence 18 conveys that the greatest benefit of practicing martial arts is “health and fitness,” and Option G illustrates some specific ways that martial arts training helps improve physical fitness—“strengthen their heart, boost endurance, improve balance, and develop muscle tone.”

**E:** Incorrect. Though the idea of advancing one’s career is certainly appealing for adults, this benefit is not directly tied to “health and fitness” and, therefore, does not support sentence 18.

**F:** Incorrect. While the passage does discuss potential benefits related to discipline, focus, and confidence (sentences 6 and 11), sentence 18 is solely related to health and fitness benefits and should not be followed by a description of “other skills.”

**H:** Incorrect. Some readers may choose this option because sentence 5, sentence 15, and sentence 18 discuss the physical aspects of practicing martial arts, but the idea that people who practice martial arts are concerned about their overall health does not provide further details about the connection between training and health.

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9. The question asks for the concluding sentence that best replaces sentence 23 and supports the topic presented in the passage.

**B: Correct.** Option B is correct because it best supports the topic of the passage—the benefits of studying martial arts—by stating two reasons why people should study martial arts: to “experience the satisfaction of achieving goals while also improving themselves.”

**A: Incorrect.** The phrase “the skills needed to progress in rank” is vague, and progressing in rank is not related to the overall topic of the passage, which is the benefits of studying martial arts. The topic of the passage is not the “many ways to begin studying martial arts” or how “people can easily discover” the benefits of martial arts.

**C: Incorrect.** Some readers may choose this option because it refers to the benefits of martial arts, but the word “because” and the detail that “enrollment in martial arts courses has increased” make this sentence unrelated to the overall topic of the passage, which is about the benefits of studying martial arts, not the number of people who participate.

**D: Incorrect.** Although the benefits of studying martial arts are described for both teens (in the third paragraph) and adults (in the fourth paragraph), the topic of the passage is the overall benefits of studying martial arts, which include mental discipline (discussed in the first, second, and third paragraphs) in addition to health benefits. Furthermore, the passage does not compare the health effects of studying martial arts across age groups.

## READING COMPREHENSION

### The Best Laid Plans of Ravens

10. The question asks how paragraph 1 introduces the ideas that ravens may perceive time and plan for the future.

**F: Correct.** Edgar Allan Poe’s poem features a raven that speaks in a prophetic way. Since prophecies are a prediction of the future, the statement suggests that the raven has a sense of time. This reference is then tied to a modern study where “researchers argue that ravens may be able to think ahead and even plan for the future” (paragraph 1).

**E: Incorrect.** While paragraph 1 states that people have historically believed that animals do not understand the passage of time, this paragraph is not the introduction to the idea that ravens may plan for the future.

**G: Incorrect.** Although the idea of a raven being aware of the future in the poem is tied to a study that “hints that one particular idea behind the poem might not be as far-fetched as it seems” (paragraph 1), this connection does not prove that the poem is what prompted scientists to conduct such a study.

**H: Incorrect.** Paragraph 1 introduces the idea “that ravens may be able to think ahead and even plan for the future” but does not explain in detail the importance of differentiating between whether ravens act on instinct or on their ability to plan.

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11. The question asks which statement describes the effect in the passage of the phrase “merely instinctual” from paragraph 2.

**D: Correct.** The passage suggests that in order for an animal’s actions to qualify as planning for the future, “the animal must use specific decision-making skills to solve a problem” (paragraph 2). The behavior of hoarding food is based on instinct and done automatically without real thought.

**A:** Incorrect. The passage does not question animals' ability to find and save food but rather whether this or other behavior involves thought and planning for the future.

**B:** Incorrect. While the sentence states that "many animals hoard food," the passage does not suggest that they give priority of thought to this activity; they hoard food out of instinct.

**C:** Incorrect. Although the passage discusses animals' tendency to store a great deal of food, it does not suggest that their hoarding goes beyond their needs.

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**12.** The question asks which sentence from paragraph 4 supports the argument presented in the sentence from paragraph 1.

**H: Correct.** This sentence from paragraph 4 shows that the ravens seem to make a decision, which involves a thought process. The ravens chose to wait for the researcher rather than take the treats, suggesting that the ravens understood that the researcher would trade a larger treat for the bottle cap.

**E:** Incorrect. This sentence from paragraph 4 refers to the ravens' ability to adapt and learn but not to plan and think ahead.

**F:** Incorrect. This sentence from paragraph 4 relates the actions of the researcher rather than the actions of the ravens and does not provide evidence in support of the argument that ravens have the ability to think and plan ahead.

**G:** Incorrect. This sentence from paragraph 4 does not describe a behavior of the ravens that would support the argument in the sentence from paragraph 1; instead it relates the actions of the researchers without giving any information about the ravens' responses.

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**13.** The question asks which of the ravens' behaviors in the first experiment described in paragraph 4 most strongly supports the claim that the birds are capable of planning.

**B: Correct.** Once the ravens learned which stone would open the box, they consistently selected only that stone.

**A:** Incorrect. While "the researchers showed the birds how to use a small stone to open a box and get treats" (paragraph 4), the acceptance of the treats does not demonstrate planning.

**C:** Incorrect. Although the birds learned which stone opened the box, this behavior demonstrates not their ability to plan but rather their intelligence.

**D:** Incorrect. The birds' patience shows their anticipation for and understanding of the future gain of a treat but does not provide the strongest evidence of their ability to plan.

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**14.** The question asks how the sentence from paragraph 4 fits into the overall structure of the passage and contributes to the development of ideas.

**E: Correct.** The patience the ravens demonstrated in the sentence from paragraph 4 while waiting for the return of the researcher in both experiments shows their understanding that the researcher's return holds a benefit for them.

**F:** Incorrect. The passage does not state that there was a set timeline for the researcher's return; the seventeen hours, mentioned in the sentence from paragraph 4, was just the longest time measured.

**G:** Incorrect. The experiment did involve the ravens solving a problem. The ravens' patience demonstrated an understanding that there would be future gain for them by waiting for the researcher, but the sentence from paragraph 4 does not demonstrate the ravens' ability to plan.

**H:** Incorrect. The way the ravens obtained the food from the researcher required far more than instinct; in order to get the maximum amount of food, a number of learned skills, such as selecting a stone that would open the box and choosing the bottle cap over the immediate treat, were necessary. The ravens' ability to wait, as demonstrated in the sentence from paragraph 4, does not influence or affect a learned behavior or a possible instinct to hoard food.

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15. The question asks the reader to choose the statement with which the author of the passage would most likely agree.

**B: Correct.** As paragraph 5 notes, "more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future." The evidence is not yet considered definitive because "some scientists argue that the ravens might be choosing the stone and bottle cap because the ravens have been trained to do so, not necessarily because the ravens are thinking ahead" (paragraph 5). Therefore, more research is needed in order to draw a complete conclusion.

**A:** Incorrect. It is very likely that additional experiments or changes to the experiments presented can help scientists tell the difference between the types of behavior that the animals are showing. The current research supports "other recent advances in animal science" and also shows that ravens are "much smarter" (paragraph 5) than previously believed, making them excellent candidates for further research.

**C:** Incorrect. The passage shows that the scientists did not draw conclusions based on one experiment alone. The passage also states in paragraph 5 that additional research and experiments are necessary in order to obtain conclusive evidence of ravens' abilities to think and plan ahead.

**D:** Incorrect. The passage claims that more evidence must be gathered in order to make a claim that animals can definitely plan for the future. The evidence presented helps scientists "believe that ravens do actually think about their own future" (paragraph 5), but more confirmation is needed. The passage does not discuss performing experiments on additional species.

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16. The question asks how paragraph 5 fits into the overall structure of the passage and contributes to the development of ideas.

**G: Correct.** Paragraph 5 notes that some doubt remains ("Some scientists argue that the ravens might be choosing the stone and bottle cap because the ravens have been trained to do so, not necessarily because the ravens are thinking ahead") and that more experimentation is needed; the author concludes that there is reason to believe the originally stated theory that ravens are quite smart and can give thought to how future events may affect them.

**E:** Incorrect. While paragraph 5 states that "more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future," this statement suggests that more research is needed, not that the results of the Lund University studies are problematic.

**F:** Incorrect. Paragraph 5 does not discuss steps of the study or emphasize difficulties in determining whether the behaviors shown in the study were planned or practiced; instead it simply suggests that more study is required to make such a determination.

**H:** Incorrect. Paragraph 5 does not list the effects of the study or criticize the experiment for not differentiating between planning and instinct. The paragraph explains why the results of the experiments are not conclusive and emphasizes that more research is needed.

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**17.** The question asks how the author conveys a point of view on the study of animal intelligence.

**A: Correct.** Paragraphs 3 and 4 focus on the process and details of the experiments that scientists conducted. This detailed information from the author provides a sense of how the ravens demonstrated planning abilities beyond natural instinct. The author supports the claims from the experiments, calling the findings “exciting” and stating in the conclusion that “these experiments show that ravens could be much smarter than first believed” (paragraph 5).

**B:** Incorrect. Although two experiments are described in the passage, the description presents the experiments as building on each other and does not compare their results. The passage states that “these experiments show that ravens could be much smarter than first believed, and scientists now believe that ravens do actually think about their own future” (paragraph 5).

**C:** Incorrect. The author presents information from the experiments and the results that were gathered from them; while there is an admission that “more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future” (paragraph 5), the author does not criticize the experiments that are presented.

**D:** Incorrect. While the author does discuss some previously held beliefs about animal intelligence in paragraph 1, the focus of the passage is that experiments indicate that there is reason to question these beliefs, since “these experiments show that ravens could be much smarter than first believed” (paragraph 5). The previously held beliefs are not considered inaccurate by the discussion in the passage because only one example—the raven—is provided. The passage does not state that beliefs about animal intelligence as a whole are inaccurate.

### Looking for the Smallest Spark of Everything

**18.** The question asks what lines 5–8 reveal about the speaker to help develop a central idea of the poem.

**F: Correct.** Lines 5–8 show the connection between the particles by using the words “beneath the level” repeatedly. The progression of particles of matter, from atoms to subatomic particles, “protons, electrons, neutrons” (line 7), ends with a question. By asking, “what, exactly?” (line 8), the speaker questions the mysteries that are still unsolved about the nature of matter, which is a central idea of the poem.

**E:** Incorrect. In lines 5–8, the speaker is demonstrating knowledge about the structure of matter, not demonstrating interest in how matter’s parts work together; for example, “beneath the level of molecules are atoms, / and beneath the level of atoms, we find / protons, electrons, neutrons” (lines 5–7).

**G:** Incorrect. The speaker expresses curiosity in line 8 (“what, exactly?”) but does not use language in lines 5–8 that expresses a desire to prove a point. The poem does not show any conflict, either from within or from other scientists, about the concept that particles make up matter.

**H:** Incorrect. While the poem is about the Large Hadron Collider, which, according to the introductory text before the poem, is a tool that “helps scientists study and understand how the smallest particles of matter interact with one another,” lines 5–8 do not suggest the use of tools but rather question what comes after the “protons, electrons, neutrons” (line 7).

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19. The question asks how the break between the second stanza (lines 5–14) and the third stanza (lines 15–26) serves as a transition between ideas.

**A: Correct.** The second stanza describes physical objects, including “your fingernail, / the candy at the back of your mouth, / the coffee your teacher drank this morning” (lines 9–11) and even “the stuffed dog” that “your little sister” (line 12) carries around. In the third stanza, the speaker introduces the topic of observation by asking, “How do we find it?” in line 17. Lines 17–18 offer one possible method for finding “it” (“We can listen for it / in the wavelengths from deep space”), while lines 20–22 describe a second method (“Or we can build long, / deep circular tunnels beneath the surface / of this Earth and race particles”). With these details, the focus of the poem shifts toward explaining how the particles that make up everything are observed.

**B: Incorrect.** While the speaker does list common items such as “candy” and “coffee” (lines 10–11) that many people are familiar with and that seem to be simple in composition or structure, the speaker does not imply in the third stanza that invisible objects complicate the world. In fact, the speaker claims that everything is “made up of the same stuff” (line 16), which simplifies the invisible world.

**C: Incorrect.** The second stanza focuses on the structure of matter (“beneath the level of molecules are atoms, / and beneath the level of atoms, we find / protons, electrons, neutrons” [lines 5–7]) and does not discuss the methods used to explore this structure in space. The third stanza mentions space (“We can listen for it / in the wavelengths from deep space” [lines 17–18]) and how we can “race particles” (line 22) on Earth but does not compare the methods of study used in these different locations.

**D: Incorrect.** While the second stanza describes items that are familiar to readers, including “your fingernail, / the candy at the back of your mouth, / the coffee your teacher drank this morning” (lines 9–11), the familiarity of these items does not necessarily mean they are part of a comfortable environment. The third stanza discusses studying the parts of matter “until everything we think we know / bangs against everything else we know” (lines 25–26). The “banging” the speaker refers to is not related to an unstable environment but rather to the mysteries of atomic structure.

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20. The question asks what the comparison in lines 23–24 of the poem is mainly meant to show.

**F: Correct.** Lines 23–24 describe “tiny cars / flashing along at close to the speed of light,” which describes how the particles move.

**E: Incorrect.** While the particles are moving “close to the speed of light” (line 24), which would make them difficult to see, the comparison in lines 23–24 focuses on the movement of the particles, not how visible they are.

**G: Incorrect.** Lines 23–24 do not describe the shape of the particles but rather their movement, which is “flashing along at close to the speed of light” (line 24).

**H: Incorrect.** The word “flashing” in line 24 does not refer to light in darkness but rather to speed, and the word “light” is used to reference a measurement of speed, not brightness in darkness.

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21. The question asks how lines 25–26 help develop a central idea in the poem.

**B: Correct.** The lines “until everything we think we know / bangs against everything else we know” (lines 25–26) are about how the old knowledge about particles interacts with newfound knowledge.

**A: Incorrect.** Lines 25–26 illustrate the collision of old and new information about particles, but they do not describe “creative methods” that are currently being invented to research subatomic particles.

**C:** Incorrect. While lines 20–22 describe the Large Hadron Collider as “long, / deep circular tunnels beneath the surface / of this Earth” where scientists “race particles,” lines 25–26 refer to the collision of old and new ideas about particles, not the limitations of the Large Hadron Collider.

**D:** Incorrect. Lines 25–26 focus on what “we think we know” about subatomic particles and how new discoveries challenge “everything else we know.” However, the challenge is not a result of scientists debating one another but rather what the Large Hadron Collider reveals about particles.

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**22.** The question asks what the imagery in lines 27–28 reveals about the speaker.

**G: Correct.** The word “explosion” and the phrase “briefly incandescent” create a picture of rapid changes and short bursts of bright light, revealing how powerful the new particles are. The language the speaker uses is positive, revealing that the speaker admires the power of the reaction and stands in awe of the new particles.

**E:** Incorrect. The physicists mentioned in the fifth stanza (lines 33–44) are described as mere observers: they “jot down / what they can” (lines 41–42). In lines 27–28, the speaker is focused on the reaction between the colliding particles, not on the physicists who study them.

**F:** Incorrect. The speaker describes the particle collision in detail, but the text does not imply that the speaker has personally witnessed a collision. The speaker implies that his or her understanding of the collision is based on the experiences of the physicists observing the phenomenon (“They spin, and it is only down there / in the darkness—in the vast garage / where physicists jot down / what they can, whatever seems most real— / that they let us perceive their wild dancing” [lines 39–43]).

**H:** Incorrect. The poem reveals the speaker’s deep knowledge about subatomic particles. For example, the speaker is able to name the new particles discovered—“the quarks, the leptons, and the bosons; / the baryons and the mesons” (lines 29–30)—and is able to use imagery to create a powerful picture that reveals the complexity of a scientific process that humans have never been able to see.

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**23.** The question asks why the speaker refers to familiar objects and events in lines 30–32.

**D: Correct.** The phrase “their names” (line 30) refers to the scientific names of the particles: “the quarks, the leptons, and the bosons; / the baryons and the mesons” (lines 29–30). In lines 30–32, the speaker expresses the opinion that these scientific terms sound nonsensical, much like the strange scientific names of dinosaurs or silly band names.

**A:** Incorrect. In lines 30–32, the speaker only gives an opinion about what the names sound like and does not simplify confusing information about how these newly discovered particles function or exist.

**B:** Incorrect. In lines 30–32, the speaker is only describing what the names of the particles sound like: “dinosaurs or maybe bands” (line 31). These descriptions illustrate the speaker’s opinion but do not explain specific scientific ideas.

**C:** Incorrect. In lines 30–32, the mention of the names of the particles sounding like “dinosaurs or maybe bands” (line 31) reveals the speaker’s opinion about the names but does not explain the process of researching the particles.

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**24.** The question asks for the most likely reason the poet includes lines 36–39 in the poem.

**F: Correct.** The particles that are “Everything and everywhere” (line 15) make up the objects mentioned in lines 36–39: a “pencil in your hand” and the planet “Jupiter.” Even though these objects are different from

each other and extremely far apart in the universe, they are made up of and affected by these particles. The “powerful effect” is that the particles keep the objects “both together and apart” (line 36).

**E:** Incorrect. While the poem implies that the research is important, lines 36–39 do not point to a need for more research. Instead, the lines explain the power of the particles in the universe.

**G:** Incorrect. While the physicists can only “jot down / what they can, whatever seems most real” (lines 41–42), the discoveries about particles are ongoing and informative. The speaker shares that the particles are “everything and everywhere” (line 15) and that they “spin” (line 34) because “this is how gravity / enters our world” (lines 34–35).

**H:** Incorrect. The speaker states that particles keep together objects in space, such as Jupiter, as well as objects on Earth, such as “the pencil in your hand right now” (line 37). However, in lines 36–39, the speaker is not comparing the study of subatomic particles with the study of objects in space (astronomy); the speaker is implying that because particles are “everything and everywhere” (line 15), the study of particles affects our understanding of everything in the universe, regardless of location.

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25. The question asks which central idea is emphasized in the last stanza (lines 33–44).

**A: Correct.** Throughout the poem, the speaker describes how everything in our universe and in our everyday lives is made up of these tiny particles. The last stanza allows us to picture the scientists working “in the darkness” (line 40), jotting down notes. Phrases like “wild dancing” (line 43) and “combusting to the music” (line 44) describe the activity of the particles and communicate the idea that the findings are exciting.

**B:** Incorrect. While the Large Hadron Collider is in an unconventional location that is important in the poem, it is the only location described in the poem: “it is only down there / in the darkness—in the vast garage” (lines 39–40). While the darkness is a special condition, the poem does not describe other conditions where the same type of research is being carried out. The poem does mention that “we can listen for it / in the wavelengths from deep space, / talking back to us from unimaginable / distances” (lines 17–20), but this description implies the use of a tool (a satellite), not a location.

**C:** Incorrect. The last stanza states that “The one thing we know for sure / is that they spin” (lines 33–34). This detail is one aspect of the particles’ behavior that is known; therefore, the particles are not completely unpredictable. In addition, the poem never describes the particles breaking up matter in the universe; the poem describes only their movements and collisions.

**D:** Incorrect. While the “physicists jot down / what they can, whatever seems most real” (lines 41–42), the research they share with the world is complicated and difficult to understand, making it unlikely that their findings are relatable to most people.

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26. The question asks what lines 39–44 reveal about the speaker.

**G: Correct.** The speaker uses the phrases “only down there” (line 39), “physicists jot down . . . whatever seems most real” (lines 41–42), and “they let us perceive” (line 43) to convey that the physicists have a rare role in studying the mysteries of the universe and that the speaker appreciates and is interested in their work.

**E:** Incorrect. While the discoveries are made “in the darkness” (line 40), the imagery conveys the speaker’s positive tone through descriptions like “perceive their wild dancing” (line 43) and “combusting to the music they make” (line 44), not frustration.

**F:** Incorrect. In lines 39–44, the imagery of energetic movement (“They spin,” “their wild dancing,” and “combusting to the music they make”) is used to describe the particles, not the physicists.

**H:** Incorrect. While the description of the experiments occurring “in the darkness” (line 40) may create a sense of secrecy, the secrets that the darkness refers to are the mysteries of subatomic particles, not the work processes that the physicists use.

### Excerpt from “The Spirit of the Herd”

27. The question asks which sentence from the excerpt best explains why Wade reserved Peroxide Jim for “emergency work.”

**D: Correct.** The sentence from paragraph 16 describes Peroxide Jim’s high level of skill and ability to perform in a life-and-death situation. Not only did Peroxide Jim recognize the emergency immediately (“From the flash of the lightning the horse had taken the bit”), but the horse also proved to have the physical capability (“had covered an indescribably perilous path at top speed, had outrun the herd and turned it from the edge of the rim rock”) and the mental fortitude (“without a false step or a tremor of fear”) required to respond appropriately to the dangerous situation.

**A:** Incorrect. While the sentence from paragraph 1 refers to Peroxide Jim’s intelligence and appearance, it does not tell why he would be useful in an emergency. Peroxide Jim is described as “supple, powerful,” and “intelligent,” which are all desirable traits for a horse used for herding cattle. However, this option is not the best answer because the sentence merely lists useful attributes, while option D shows those attributes being used in an actual emergency situation.

**B:** Incorrect. The sentence from paragraph 10 does not describe the actions of Peroxide Jim. The sentence describes what Wade and the horse were experiencing, but it does not include any reference to how Peroxide Jim was responding to the situation.

**C:** Incorrect. The sentence from paragraph 11 describes Wade’s experiences and does not focus on the actions of Peroxide Jim. It reveals Wade’s awareness of the danger he was in, but the only reference to Peroxide Jim in this sentence is the description of the horse having to work harder to run on the stonier ground as they neared the edge: from “the plunging of the horse,” Wade knew “that the ground was growing stonier, that they were nearing the rocks.” This quotation does not show that Peroxide Jim was the right horse to use for emergency work because it does not indicate, at this point in the text, that he was responding in a way that saved the herd or Wade.

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28. The question asks how paragraphs 1–2 contribute to the development of the central idea of the excerpt.

**E: Correct.** The description of Peroxide Jim in paragraph 1 indicates that the horse was a fine animal (“Along with the wagon had come the fresh horses—one of them being Peroxide Jim, a supple, powerful, clean-limbed buckskin, a horse, I think, that had as fine and intelligent an animal-face as any creature I ever saw” [paragraph 1]). The statement in paragraph 2 that Wade’s “faith in Peroxide Jim was complete” supports the central idea of the excerpt that Wade believed in Peroxide Jim’s abilities even before the horse turned the herd and saved the cattle.

**F:** Incorrect. Paragraphs 1–2 do not emphasize Wade’s high expectations for himself, nor are these expectations a central idea of the excerpt. The narrator expresses a high opinion of Wade’s abilities in his comparison of Peroxide Jim and Wade, referring to the horse as a “complement” (paragraph 1) for Wade; however, Wade showed complete trust in the horse’s ability to save the herd without his help, as evidenced by Wade dropping the reins to allow the horse to control the situation (paragraph 12).

**G:** Incorrect. The paragraphs refer to Peroxide Jim’s ability to handle cattle; in fact, paragraph 2 says that “the horse knew the cattle business.” It can be inferred that Wade had this knowledge as well, but this idea is not the focus of paragraphs 1–2 and is not the central idea of the excerpt.

**H:** Incorrect. Wade’s ability to judge a horse’s competence is not a central idea of the excerpt. The event described in the text is proof that Wade knew how to judge a horse’s ability: Wade trusted Peroxide Jim, and Peroxide Jim did not let him down. The option puts the focus on Wade and one of his strengths, when the central idea and focus of the excerpt is Peroxide Jim’s abilities and strengths, not Wade’s.

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**29.** The question asks how paragraph 3 conveys the effect of the setting on the cattle drive.

**B: Correct.** Paragraph 3 describes the land where the herd was as being “as level as a floor” but “rimmed by sheer rock, from which there was a drop to the bench of sage below.” The drop was “a perpendicular fall of about three hundred feet”—any animal or person could fall over that edge. It was the change in height, from flat tableland to sheer drop-off, that made the terrain so dangerous.

**A:** Incorrect. The riders were not trying to move the herd through the darkness. Instead, the reference to the growing darkness (“overtaken by the dusk”) indicates that the riders had halted the animals for the night because moving the herd across the desert in the darkness would have been much too dangerous because of the sheer drop-off at the edge of the tableland. The riders needed the daylight to navigate the herd safely through the “pass descending to the next lower bench.”

**C:** Incorrect. The use of the word “desert” in the first sentence of the paragraph does not highlight the isolation of the setting nor indicate that the riders and the herd were uncomfortable being alone. Instead, the word merely establishes the setting where the action occurred: “it lay as level as a floor, rimmed by sheer rock, from which there was a drop to the bench of sage below.”

**D:** Incorrect. The excerpt does not indicate that the steep terrain made it difficult for the herd to move forward. The herd was not expected to navigate the steep terrain. Instead, the steep terrain presented a danger to the herd that must be avoided. The riders intended to move the herd safely through passes that descended gradually to lower elevations.

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**30.** The question asks which sentence from the excerpt best reveals the mood on the drive before the lightning struck.

**F: Correct.** The sentence from paragraph 5 describes the riders singing “to preempt the dreaded silence, to relieve the tension” and to prevent “shock” from any sudden noise. These words provide a strong sense of the tense, heavy mood in which a terrible event such as a stampede could quickly happen.

**E:** Incorrect. The sentence from paragraph 3 describes the setting but does not contain words that create a strong mood. In fact, this sentence shows that while there were dangerous surroundings, the riders and the herd were “now halted.”

**G:** Incorrect. The sentence from paragraph 6 contains words that communicate refreshment and relief: “fresh, moist wind with the taste of water.” Relief was not the primary mood before the lightning struck; instead, the refreshing scent of rain and its promise of water was partially responsible for the herd’s stampede toward the edge once the lightning struck (“their bald faces lifted to drink the sweet wet breath that came over the rim” [paragraph 7]).

**H:** Incorrect. While the words “ghostly” and “still moving in a circle” in the sentence from paragraph 9 create a strange and mysterious image, the mood before the lightning struck was not one of mystery or suspense. Instead, these descriptive words are used to indicate Wade’s faint ability to see the herd moving in the dark.

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31. The question asks how paragraph 9 fits into the overall structure of the excerpt.

**D: Correct.** Paragraph 9 describes the lightning strike that made the cattle panic and stampede. The stampede is the main conflict Wade and Peroxide Jim addressed in the excerpt; and therefore, paragraph 9 is essential to the overall structure of the text.

**A: Incorrect.** Wade was alert long before the events of paragraph 9. In paragraph 4, he began singing to the cattle because he knew that they were on the verge of stampeding. He was even more alert when he “caught a breath of fresh, moist wind with the taste of water in it” (paragraph 6) and heard thunder in paragraph 8: “The sound seemed to come out of the earth, a low, rumbling mumble.”

**B: Incorrect.** Wade and the other riders were not calm; rather, they were alert and attempting to keep the cattle calm by singing to them. They were as prepared as they could be for what was about to happen, as shown in paragraph 1, through the selection of fresh horses and, specifically, Wade’s choice to ride Peroxide Jim in the face of possible danger: “Wade had been saving this horse for emergency work.”

**C: Incorrect.** Although Wade’s leadership is implied in paragraph 9 (“He must keep them going. He touched his horse to ride on with them”), his leadership is revealed in earlier portions of the excerpt as well (“Wade had been saving this horse” [paragraph 1]; “Wade began to sing” [paragraph 5]), so this is not new information and is not relevant to the overall structure of the excerpt.

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32. The question asks how the sentences from paragraph 11 and paragraph 16 develop a central idea in the excerpt.

**G: Correct.** Wade recognized that Peroxide Jim knew to turn the herd without any instruction from him. Throughout the excerpt, Wade exhibited confidence in his horse, Peroxide Jim. For example, the narrator describes Peroxide Jim as a “superior horse” in paragraph 1 and says that Wade’s “faith in Peroxide Jim was complete” in paragraph 2. After Wade let go of the reins (paragraph 12), the horse took over, doing exactly what needed to be done to save Wade, the herd, and himself: “a big white steer, which the horse, with marvelous instinct, seemed to pick out from a bunch, and to cling to, forcing him gradually ahead, till, cutting him free from the bunch entirely, he bore him off into the swishing sage” (paragraph 14).

**E: Incorrect.** While Peroxide Jim’s presence was critical to saving the herd, the details in paragraph 11 and paragraph 16 do not focus on this idea. The primary idea is that the horse was so intelligent and aware that he acted on his own.

**F: Incorrect.** The excerpt does not tell who trained Peroxide Jim. It can be inferred that Peroxide Jim had been well trained and was knowledgeable of working cattle; however, there is no indication that Wade was the person who trained Peroxide Jim, only that Wade knew of Peroxide Jim’s abilities, respected the skilled horse, and was “saving this horse for emergency work” (paragraph 1). Because the reader cannot infer from the excerpt that Wade was the trainer, this idea cannot be considered central to the excerpt.

**H: Incorrect.** The sentence from paragraph 11 and the sentence from paragraph 16 show that Peroxide Jim acted skillfully and with the knowledge that the ride was dangerous (“Wade was riding for his life. He knew it. His horse knew it” [paragraph 11]). There is no indication that Peroxide Jim was not afraid; in fact, it is likely the awareness of the danger and the fear associated with that knowledge contributed to the horse’s motivation to turn the herd.

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**33.** The question asks what the phrase “bore down the flank of the herd” conveys about Wade.

**C: Correct.** The phrase “bore down the flank of the herd” conveys the overwhelming strength of the herd. The herd was forcing Wade toward the cliff. The wording in the quotation emphasizes the immediate danger of the situation and conveys the idea that Wade and Peroxide Jim were almost forced over the edge of the precipice by the stampeding herd.

**A: Incorrect.** While Wade struggled to see the front of the herd, the words “bore down the flank of the herd” are meant to convey the intensity of the situation Wade was in, not the way the herd is blocking his vision.

**B: Incorrect.** The sentence from paragraph 13 states that the herd was “close on their left” and includes the phrase “bore down.” Both of these phrases indicate that Wade was trapped between the stampeding herd and the steep cliff. Wade and Peroxide Jim were struggling to reach the very front of the herd to turn it away from the edge.

**D: Incorrect.** The phrase “bore down the flank of the herd” does not indicate anything about the fear felt by the herd. The phrase is about Wade’s position between the edge of the stampeding herd and the drop-off. Wade was aware of the danger the herd was in if he and Peroxide Jim could not turn the cattle from the edge.

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**34.** The question asks how the details in paragraphs 14–16 help convey a central idea of the excerpt.

**E: Correct.** Paragraphs 14–16 describe how Peroxide Jim’s “marvelous instinct” headed off the herd and drove it away from the cliff. Wade acknowledged that without his instruction, Peroxide Jim knew to find the leader of the herd, cut him off from the rest of the herd, and then lead him to safety, confident that the remainder of the herd would follow. Paragraph 16 confirms this: “Whose race was it? It was Peroxide Jim’s, according to Wade, for not by word or by touch of hand or knee had the horse been directed in the run.” This reinforces a central idea of the excerpt regarding the horse’s amazing intellect and ability.

**F: Incorrect.** Although paragraphs 14–16 mention the “rim,” the “cliffs,” and the “indescribably perilous path,” these details are not the focus of the paragraphs. They are descriptions of the setting where Peroxide Jim’s able and effective actions saved the stampeding herd, and it is these actions that are the central idea being conveyed.

**G: Incorrect.** Although Peroxide Jim is called “powerful” in paragraph 1, his physical strength is not a central idea of the excerpt nor the focus of paragraphs 14–16. His success at turning the herd was attributed to his intellect and instinct, not his physical strength.

**H: Incorrect.** The excerpt does not suggest that Peroxide Jim anticipated the herd’s stampede before the men did. In fact, the excerpt indicates that Wade led the men in singing to cover sudden noises that might cause the herd to stampede, indicating that Wade was alert to that possibility. Paragraph 7 also indicates that Wade anticipated the stampede, as he “checked his horse instantly” and tightened his “grip on the reins” as soon as he smelled the rain and heard the low rumble of thunder that preceded the lightning strike. The narrator notes Wade’s actions well before the horse’s actions. Paragraphs 14–16 describe how Peroxide Jim acted after the stampede began.

## A Memory Revolution

35. The question asks which sentence from the passage suggests that using Internet search engines may lead people to rely less on their own ability to recall information.

**C: Correct.** The sentence in paragraph 2 reveals the results of a study that allowed half the participants to use Google to obtain answers to trivia questions and initially required the other half to use only their memory to answer questions. The sentence states that “83 percent of the Internet group continued to consult Google in the second round” and that “only 63 percent of the memory group chose to do so.” These statistics demonstrate that using Google in the first round resulted in participants in the “Internet” group relying more heavily on the Internet search engine to recall information in the second round, whereas participants who did not use Google in the first round were more likely to rely on their own ability to recall information.

**A: Incorrect.** While the sentence in paragraph 1 refers to the increase in use that has made the Internet “an integral component” of everyday life for many people, it does not address memory or explain the effect of Internet use on a person’s ability to recall information.

**B: Incorrect.** Although the sentence in paragraph 2 refers to research that was conducted to determine how the use of the Internet affects a person’s memory, the sentence simply explains one guideline of the study. The fact that the study required one group of participants to use Google does not indicate whether using a search engine affects the degree to which people rely on their own ability to recall information.

**D: Incorrect.** The sentence in paragraph 3 compares the Internet to older resources, such as encyclopedias, that allowed people to access and retrieve large amounts of information. Although the sentence states that people have always used resources “to assist their memories,” it does not describe whether people mainly rely on their own ability or on the Internet to recall information.

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36. The question asks how the details in paragraph 3 about cognitive offloading convey a central idea of the passage.

**F: Correct.** A central idea of the passage is that the Internet is changing how people retain information. Paragraph 3 supports this idea by stating that “a similar process has been taking place for centuries” and that “in the past,” resources such as encyclopedias were used to store and find information. The details provided in paragraph 3 about encyclopedias and the Internet show that people have always used resources to remember information and that these resources change over time as people develop new ways to “assist their memories.”

**E: Incorrect.** Although paragraph 3 describes the Internet as “a vast extended memory,” it does not discuss reliance on the Internet for information. The paragraph states that the Internet “allows people to digitally access and retrieve much larger volumes of information” and indicates that this benefit leaves people free to focus on “connecting data, learning new information, or solving problems.” However, these details about the benefits of the Internet do not express an opinion about the inevitability of Internet reliance.

**G: Incorrect.** While paragraph 3 does compare the use of encyclopedias to obtain information in the past with the use of today’s Internet, this comparison fails to convey the central idea of the passage that the Internet is changing how people remember information.

**H: Incorrect.** Although paragraph 3 states that “much larger volumes of information” are available on the Internet than what has been available in previous methods of information storage, such as encyclopedias, this fact does not relate to an increase in the ability to understand that information and is not a central idea of the passage.

**37.** The question asks how the details of the experiment described in paragraph 5 convey a central idea of the passage.

**D: Correct.** A central idea of the passage is that the way the human memory stores information is changing because of the Internet. The details of the experiment support this idea by indicating that study participants remembered different amounts of information based on whether they “thought the information would be saved” (paragraph 5). Those who “believed the information would be erased and no longer available” (paragraph 5) remembered 40 percent more—almost twice as much—as those who expected to be able to access the information again in a saved computer file. Therefore, paragraph 5 conveys the central idea that the expectation of future access to information is a key element in “how people evaluate which information deserves their effort to remember” (paragraph 5).

**A: Incorrect.** Although paragraph 5 states that participants read the trivia facts and then “typed the statements into a computer file,” it does not explain the impact of repetition on memory, nor does it convey a central idea of the passage.

**B: Incorrect.** Paragraph 5 acknowledges that people evaluate which information is important enough to remember, but it does not describe the rate at which people forget unimportant information. According to the paragraph, information is considered less important to remember if a person believes that he or she will be able to retrieve that information easily in the future. This does not mean the information is unimportant but rather that it is readily available for future access.

**C: Incorrect.** Paragraph 5 specifies the number of trivia facts that study participants were given to read (forty), but it does not describe the amount of information as a factor in the participants’ memory performance. According to the paragraph, it was not the amount of information but rather the expectation of future availability that affected how much information participants were able to recall.

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**38.** The question asks how the study described in paragraph 6 influenced researchers’ ideas about memory in the digital age.

**G: Correct.** The study in paragraph 6 demonstrated that participants were better able to recall where to find certain information than to recall the information itself. This influenced researchers’ ideas about memory in the digital age: “Overall, participants recalled the information’s location more often than the content itself, correctly identifying 49 percent of the folders for specific facts while remembering only 23 percent of the actual trivia” (paragraph 6).

**E: Incorrect.** The study required participants to organize information into folders, but the results suggest that organizing the information did not make the information easier to remember; instead, participants remembered the folder in which to find the information but forgot the information itself.

**F: Incorrect.** Although the participants in the study were given a keyword, such as “ostrich,” when asked to remember “which folder contained a particular fact,” the study was significant for researchers because it demonstrated that “our memory is adapting to the Internet age by prioritizing where to locate information even when the specific details are forgotten” (paragraph 6).

**H: Incorrect.** The study did not examine the relative importance of remembering basic information or storing detailed information. It examined the effect of the Internet on the information that people remember and concluded that human memory “is adapting to the Internet age by prioritizing where to locate information” (paragraph 6).

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**39.** The question asks for the evidence from the passage that is most relevant to the claim in paragraph 7 that “far from making us stupid, these technologies are the only things that will keep us smart.’ ”

**B: Correct.** The assertion made in paragraph 3 that states that cognitive offloading allows for “people’s minds” to be “free for other cognitive feats, such as connecting data, learning new information, or solving problems” is relevant to the claim in paragraph 7 because it indicates that the ability to store large amounts of information within the brain does not necessarily make someone smart. It also suggests that if people did not have to use so much effort simply organizing and storing information, their brain would be free to conduct higher-order tasks: “the Internet, serving as a vast extended memory, allows people to digitally access and retrieve much larger volumes of information. Consequently, people’s minds are free for other cognitive feats, such as connecting data, learning new information, or solving problems” (paragraph 3).

**A: Incorrect.** Whether the participants decided to use the Internet to answer easy trivia questions varied based on the options that the participants were given during the first part of the experiment and, therefore, cannot be relevant to the claim in paragraph 7. Even when given the option of using the Internet, some participants chose to recall information from memory instead.

**C: Incorrect.** The discussion in the passage connecting how people organize information in their mind and their ability to recall that information focuses on the process of organizing information within human memory rather than on how technology helps keep people’s minds available for complex thoughts.

**D: Incorrect.** Although the passage provides an accurate description of transactive memory, it provides no indication of how using such memory would advance a person’s ability to maintain or improve intelligent thought.

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**40.** The question asks how the sentence in paragraph 7 contributes to the structure and development of ideas in the passage.

**G: Correct.** Paragraphs 2 and 6 describe the results of experiments related to the Internet’s effect on memory without commenting on the advantages or disadvantages of relying on that technology, and the sentence in paragraph 7 presents a doubtful viewpoint that moves away from the neutral perspective of the broader passage. The opinion in the sentence is directly argued against in the three sentences that follow it, which present an extended quote from Steven Pinker, a psychology professor at Harvard University. Pinker refutes the idea expressed by the sentence, stating that “knowledge is increasing exponentially; human brainpower and waking hours are not’ ” (paragraph 7). He adds that technologies such as the Internet “are the only things that will keep us smart’ ” (paragraph 7).

**E: Incorrect.** Although the studies showed, in part, that reliance on the Internet is increasing (“participants recalled the information’s location more often than the content itself” [paragraph 6]), the studies were not conducted in order to determine the risks of Internet use. The research described in paragraphs 2 and 6 did not prompt scientists to investigate the risks of relying on the Internet.

**F: Incorrect.** While the sentence in paragraph 7 poses a question about the disadvantages of relying on the Internet, paragraphs 2 and 6 present the study data on Internet use and memory in a neutral tone (“correctly identifying 49 percent of the folders for specific facts while remembering only 23 percent of the actual trivia” [paragraph 6]). Neither study describes the availability of information on the Internet as an advantage or a disadvantage.

**H: Incorrect.** Although the sentence in paragraph 7 expresses caution about the possible effects of the Internet on memory, the passage does not shift from an optimistic tone to a cautious tone. Actually, paragraph 6 provides the data on Internet use and memory in a neutral tone. And the last sentence of paragraph 7 includes a quotation that states, “Far from making us stupid, these technologies are the only

things that will keep us smart,' " which introduces a doubtful viewpoint to the passage. Additionally, the argument expressed by the sentence is not elaborated on in the sentences that follow; instead, the sentence is immediately argued against by the quotation from Steven Pinker, a professor of psychology.

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- 41.** The question asks how the studies presented in the passage are used to illustrate the effect of the Internet on a person's memory.

**A: Correct.** The study described in paragraph 5 examined the effect of computer use on the way people evaluate information, specifically "which information deserves their effort to remember," and determined that "those who believed the information would be erased and no longer available could recall 40 percent more facts than those who thought the information would be saved." The study described in paragraph 2 established that the use of Internet search engines increases the "inclination to rely on the Internet in order to retrieve information" (paragraph 3), and the study in paragraph 6 examined how this reliance on technology affects the way people store information: "Overall, participants recalled the information's location more often than the content itself."

**B: Incorrect.** Although a difference in the ability of the human brain and the capacity of the Internet to locate information might seem evident, the studies cited in the passage did not examine the ability or the capacity of either. The studies did not measure what the human brain is capable of but rather how memory is affected by the use of the Internet.

**C: Incorrect.** While the studies explored the Internet's effect on the way information is stored in human memory, the type of information was not described or compared. Instead, the studies indicated that location is the main difference between the information stored in the Internet and the information stored in human memory, noting that the Internet has become "an external source of the recollections and associative networks that constitute memory" (paragraph 6).

**D: Incorrect.** Although it is increasingly common to use the Internet to obtain information (paragraph 2) rather than try to memorize information (paragraph 5), the studies did not examine the difficulty or ease of obtaining/recalling information using either method.

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- 42.** The question asks how the diagram provides additional support for the topic presented in the passage.

**H: Correct.** The diagram depicts the connections that the human brain maintains between the different forms of memory. It also illustrates the idea that repetition and rehearsal are important steps in creating memories, as unrehearsed information will be forgotten. This supports the passage by highlighting the idea that access to search engines and other tools lead people to skip rehearsal and repetition steps that create memories because people know that the information is readily accessible.

**E: Incorrect.** While the diagram indicates that the human brain has the ability to maintain different types of memory, the diagram does not show the need for the brain to adapt in order to obtain information from other sources rather than from the Internet.

**F: Incorrect.** The diagram enhances the reader's understanding of how long-term memories are formed, but it does not provide details about how the Internet can be used to improve long-term recollection of information.

**G: Incorrect.** The diagram provides an understanding of how details that are important to people can become stored because of an effort made to recall them. However, the diagram does not show how people decide which information is important and which is not.

## Serpent Mound

43. The question asks how lines 1–2 contribute to the development of ideas in the poem.

**B: Correct.** The lines, with their mention of measuring tapes and sketchbooks, indicate that the reason the museum men came was to measure the mound and to draw sketches of it.

**A: Incorrect.** The idea that the men are too busy with their work to talk to the speaker is not conveyed in the poem, and, in fact, one of the museum men discusses the oval mound with the speaker (“as if swallowing the sun, one of the museum / men suggested” [lines 31–32]).

**C: Incorrect.** There is little indication in the poem that the museum men have a hidden motive for studying the mound. Lines 1–2 present a straightforward description of the men and their equipment, which emphasizes the men’s academic interest in studying the mound.

**D: Incorrect.** While the speaker displays some curiosity about the work the museum men are doing (“one of the museum / men suggested, taking notes with his quill pen, / an old-style inkhorn slung at his side. / I liked that” [lines 32–35]), lines 1–2 focus on introducing the idea that the mound is a formation that is worth formal study and examination by experts.

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44. The question asks what impact the words “swish,” “chitter,” and “cry” in lines 12–13 have in the poem.

**E: Correct.** The words highlight the sounds of the animals that visit the mound in the summer: the “swish of a beaver’s heavy tail” (line 12), the “chitter of a chickadee” (line 13), and the “cry of a hawk” (line 13). These words help contrast the quiet stillness of the setting around the mound in the winter.

**F: Incorrect.** While the words in lines 12–13 convey the sounds certain animals make in the summer, the sounds of the animals that live near the mound are a natural part of life in the area, not a disruption.

**G: Incorrect.** The speaker is contrasting the sounds of the animals around the mound during the rest of the year with the silence of the winter months, not merely indicating the variety of wildlife.

**H: Incorrect.** The speaker expresses the idea that the mound is more visible in the winter because of the lack of brush (“It being winter, / there was little underbrush to speak of” [lines 8–9]). Then lines 12–13 describe sounds, not the appearance of the mound in winter.

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45. The question asks which lines reveal how the setting affects the speaker and the men from the museum.

**C: Correct.** The imagery in lines 14 and 15 describes how the winter silence makes the speaker and the men feel emotional heaviness: it “pressed / down on all of us like a weight” (lines 14–15).

**A: Incorrect.** Although lines 7 and 8 do describe the setting, the lines do not describe how the setting affects the speaker and the men.

**B: Incorrect.** The words “being winter” (line 8) work to establish the setting, but lines 8 and 9 do not describe the effect the winter setting has on the speaker and the men.

**D: Incorrect.** Although the words “the humps in the ground were all but / invisible” (lines 16–17) describe how the setting appears to the speaker and the men, lines 16 and 17 do not describe how the setting affects them.

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**46.** The question asks what impact the phrases “all but / invisible” and “even less obvious” in lines 16–18 have on the meaning of the poem.

**E: Correct.** The words “all but / invisible” indicate that a person must be close to see the humps in the ground, while the phrase “even less obvious” indicates that a person must be far away to see the overall snake shape of the mound.

**F: Incorrect.** While the speaker has to lead the museum men to the mound because they did not know the exact location, the words in lines 16–18 are related to the difficulty in viewing the mound from the immediate surrounding area.

**G: Incorrect.** The speaker is willing to take the museum men out to study the mound, so there is no indication in the poem that the speaker wants the location of the mound to remain a secret. The words in lines 16–18 convey the idea that the mound is difficult to see.

**H: Incorrect.** While the speaker contemplates the significance of certain elements of the mound, the phrases in lines 16–18 relate to a viewer’s ability to see the physical shape of the mound, not its deeper meaning.

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**47.** The question asks how line 28 contributes to the development of ideas in the poem.

**C: Correct.** Line 28 introduces the presence of the oval mound at the mouth of the snake. The meaning of this oval is of great interest to the museum men and the speaker. Line 28 leads to the idea that there is speculation about the oval mound (“as if the snake were about to swallow an egg” [line 29], “as if swallowing the sun” [line 32], and “It is singing to the sun” [line 38]).

**A: Incorrect.** Although the museum men are documenting the shape of the mound in line 33, lines 29–32 and 35–41 focus on what the oval mound represents as interpreted by the museum men, the speaker, and the speaker’s sister.

**B: Incorrect.** While the lines preceding line 28 describe the body of the snake in detail (“you could climb / a tree and get some idea of the whole thing: / the serpent’s body undulating, slithering / silently across the ancient / earth” [lines 24–28]), the purpose of line 28 is to begin the development of the ideas about the oval shape at the end of the mound: the serpent’s mouth.

**D: Incorrect.** The speaker does not say that the oval shape near the end of the mound is difficult to see. Earlier, the speaker says that the ridges of earth are difficult to see unless you are near them, but the speaker does not say this about the oval shape.

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**48.** The question asks how the poet uses dialogue to contrast the points of view of the speaker and Ruth regarding the mound.

**H: Correct.** Beginning in line 37, after the speaker suggests the mound is swallowing the sun, Ruth disagrees. The poet uses the word “insisted” in line 39 to show that Ruth firmly believes in her own interpretation of the mound.

**E: Incorrect.** The interpretation Ruth offers of the mound as a snake singing is abstract, but Ruth does not seem to acknowledge that it is a metaphorical or figurative interpretation. The dialogue serves to highlight that Ruth is firm in her belief.

**F: Incorrect.** There is no indication that the museum men are considering Ruth’s interpretation of the mound. Ruth’s interpretation is meant to convey an abstract idea, while the museum men would be looking

for a firm academic explanation of the mound. Ruth is persistent in her belief, and the museum men's interpretation or findings are unlikely to change her perspective.

**G:** Incorrect. Ruth merely states her interpretation and says that she thinks she hears the Serpent Mound singing sometimes. She does not seek to make the speaker agree with her.

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**49.** The question asks how the poem's form contributes to the poem's meaning.

**A: Correct.** The poem is structured as one long stanza. The line lengths throughout the poem and the line indents (such as those in lines 7–10) create a visual effect so that the poem itself mimics the shape of the Serpent Mound.

**B:** Incorrect. The uneven line lengths in the poem do not indicate the different interpretations of the mound; separate stanzas or other stopping points would more effectively point to contrasting ideas.

**C:** Incorrect. The dashes in the poem lead to further explanation of a thought, not a change of thought.

**D:** Incorrect. The lack of regular rhyme and meter is intended to create a conversational tone rather than show the speaker's struggle to grasp how large the mound is.

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**50.** The question asks how the interaction between the speaker and Ruth in lines 37–41 conveys a central idea of the poem.

**F: Correct.** The interaction references Ruth's interpretation of the open-mouth shape as a serpent singing to the sun. This interpretation creates a joyful mood. The speaker contrasts this perspective with the idea that the mound is swallowing the sun, which creates a more aggressive feeling. These various interpretations of a physical shape arise out of what the individuals feel when they look at the mound.

**E:** Incorrect. While there are many different interpretations of the mound's meaning, there is no way to determine which of the interpretations is most accurate, and there is no way to know the mound's true purpose.

**G:** Incorrect. The speaker does not describe any benefit to considering what different people imagine when they see the mound. Instead, the speaker is simply describing different interpretations.

**H:** Incorrect. Ruth's interpretation of the mound's shape is fanciful and symbolic. It is unlikely scientific study would change the minds of people such as Ruth about the meaning of the mound.

### Massachusetts: Lowell National Historical Park

**51.** The question asks why the author includes the quotation from the Scottish traveler in the passage.

**C: Correct.** The quotation emphasizes the idea that the United States offers different attractions. The Scottish traveler highlights the two places in the United States that he will most remember. First, the beautiful natural formation of Niagara Falls ("the glory of American scenery") and, second, the industrial city of Lowell ("the glory . . . of American industry").

**A:** Incorrect. While it is likely that people outside the United States recognized that both the natural landscape and the bustling industry were significant, the quotation from the Scottish traveler is meant to convey the variety of the types of attractions in the US, not to make a general statement about their contribution.

**B:** Incorrect. The Scottish traveler mentions both “American scenery” and “American industry” in the quotation, but the intent is to highlight that they are each points of interest. The quotation does not provide a comparison of the two attractions.

**D:** Incorrect. The Scottish traveler mentions both “American scenery” and “American industry” in the quotation but does not imply that the natural resources contributed to the development of industry.

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**52.** The question asks for the sentence in paragraph 2 that best supports the idea that Lowell became “a bustling industrial city” (paragraph 1).

**H: Correct.** This sentence supports the idea that, within a few decades, the city’s mills employed “over 10,000 workers” in a mile-long stretch along the river. This sentence shows that the city was “bustling” and populated.

**E:** Incorrect. This sentence provides details on when the town of Lowell was founded and on the natural features of the area, but it does not support the idea that the city became “a bustling industrial city” (paragraph 1).

**F:** Incorrect. This sentence provides specific details about the how the mills worked and indicates that the mill buildings were a noticeable feature of the city. It does not refer to Lowell becoming “a bustling industrial city” (paragraph 1).

**G:** Incorrect. This sentence lists some recognizable mill buildings along the river and notes when their associated businesses were established. It does not refer to Lowell becoming “a bustling industrial city” (paragraph 1).

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**53.** The question asks which statement best describes how the sentence in paragraph 3 fits into the overall structure of the passage.

**A: Correct.** The sentence in paragraph 3 provides a transition from the overall description of the city and the mills to a description of the women who made up the workforce in the mills. The idea that women left domestic life in favor of working in the mills is important in the passage, and the sentence serves to connect that idea to the previous discussion about the mills.

**B:** Incorrect. While the mill girls’ dissatisfaction with their working conditions is addressed later in the passage (“These wage cuts, deteriorating working conditions, and long workdays led the ‘mill girls’ to protest and organize strikes” [paragraph 4]), the sentence in paragraph 3 does not indicate a shift in tone from positive to negative. The sentence provides a transition to the discussion of the women who worked in the mills.

**C:** Incorrect. Although the sentence in paragraph 3 mentions that women became interested in working in the mills because of the “constricted lifestyle of small rural towns,” structurally this sentence serves to provide a connection between the previous discussion of the mills and the women who made up the mill workforce. The sentence “Most were young single Yankee girls, who were tired of the limited opportunities offered by their domestic work” (paragraph 3) provides more detail about the circumstances that prompted women to leave their hometown.

**D:** Incorrect. The sentence in paragraph 3 focuses on the choices women made to leave rural towns to work in the city in the early to mid-1800s, not the mid-1800s to the late 1800s. The sentence does not create a comparison between the workforce in the mid-1800s and that in the late 1800s.

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**54.** The question asks for the sentence that best summarizes the mill girls' time as the dominant workforce in Lowell.

**H: Correct.** The details about the mill girls' time as the primary workforce in Lowell is outlined in paragraphs 3 and 4. These paragraphs explain how women initially were excited by the opportunity to live independently ("Women found that Lowell's mills offered monthly wages for their services and provided them room and board" [paragraph 3]). Over time, however, the working conditions changed and became unfavorable, leading the women to leave the industry when their calls for change were not addressed by mill owners ("When their demands went unheard, the women left Lowell, and immigrant groups replaced them in the workforce" [paragraph 4]).

**E: Incorrect.** While the passage explains that mill girls were initially eager to leave the domestic duties of life in rural areas, the summary sentence does not address the details about the mill girls' time working in the mills or the changes that led the mill girls to leave the industry.

**F: Incorrect.** Mill girls initially found satisfaction in the mill work and lifestyle, and when they did leave, immigrants filled the empty jobs. This summary sentence, however, does not address the details about the mill girls' time as the primary workforce in Lowell or the circumstances that led them to leave their jobs in the mid-1800s.

**G: Incorrect.** Mill girls did leave home to work in the Lowell mills, and they did grow dissatisfied over time, but this summary sentence does not include details about the mill girls' actions to improve the working conditions, and it incorrectly emphasizes the rigid boardinghouse rules as a key reason the mill girls were unhappy with their working conditions.

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**55.** The question asks how the sentence in paragraph 5 contributes to the development of ideas in the passage.

**B: Correct.** The sentence from paragraph 5 shows that early Irish immigrants were critical to the success of Lowell as an industrial city. This information supports the development of the idea that the work of Irish immigrants and immigrants from other places is an important element in the historical significance of industry in Lowell.

**A: Incorrect.** The sentence from paragraph 5 does not imply that Lowell was founded by early Irish immigrants. The sentence explains how Irish immigrants had been settling in Lowell since the city was established and that they contributed to the construction of the city, which allowed it to become an industrial center several decades later.

**C: Incorrect.** The sentence from paragraph 5 does not suggest that new Irish immigrants were readily accepted into the community. Paragraph 5 states that "initially, Lowell's Protestant community was slow to welcome Irish immigrants, but the hostility between Yankee Protestants and Irish Catholics eventually disappeared."

**D: Incorrect.** The sentence from paragraph 5 does not highlight the relationship between the mill girls and the new Irish immigrants. Paragraph 4 explains how the mill girls left Lowell, and paragraph 5 states that the mill girls were replaced by "predominantly Irish Catholics, who traveled to America during the Great Potato Famine" but does not discuss a relationship between them.

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**56.** The question asks which description conveys the central idea that Lowell was “one of America’s most significant industrial cities” (paragraph 1).

**G: Correct.** The details throughout the passage about the development of the mills and the people who worked in them conveys the significance of Lowell in early American industry. Paragraph 2 shares details about the businesses that started in the early 1800s and contributed to the development of industry in the region (“The most recognized of these buildings are the Lowell Manufacturing Company chartered in 1821, the Suffolk or Wannalancit Mill completed around the 1880s, the Boott Mill Company established in 1835, and the Boott Mill Boardinghouse that opened in 1838”). Then paragraphs 3–6 provide specific details about the people who worked in the mills at different points in time.

**E: Incorrect.** While the passage does state that the city’s canals, mills, and boardinghouses were built by early immigrants from Ireland, these details do not contribute to the development of the overall idea that Lowell was a significant industrial city.

**F: Incorrect.** The details about the women and immigrants who worked in the mills is important to the passage, but these details alone do not show that Lowell was a significant industrial city.

**H: Incorrect.** Although the passage references Lowell’s culturally diverse community (“Young Yankee women, immigrant families, and European tourists all flocked to Lowell to find work at one of the many textile mills” [paragraph 1]), these groups are not what marked Lowell as a significant industrial city.

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**57.** The question asks for the reason that best illustrates why Lowell lost its status as an industrial leader.

**C: Correct.** When Lowell was initially established, the mills in the city thrived because of their use of state-of-the-art manufacturing methods. However, manufacturing technology changed and improved over time. New manufacturing methods were more efficient, and many mill owners chose to close the mills rather than modernize them, and Lowell lost its status as a model of industry (“The city officially began to close down its mills in the 1920s and ’30s after Lowell’s outdated mills could no longer compete against the state-of-the-art cotton mills in other communities and working conditions continued to decline as Lowell’s companies stopped reinvesting in their mills” [paragraph 6]).

**A: Incorrect.** While the passage discusses the poor living and working conditions, these details highlight that mill workers had a difficult life and that mill work was no longer seen as a better job than farmwork or domestic duties. This is not the reason Lowell is no longer a “model of industry.”

**B: Incorrect.** Paragraph 5 in the passage acknowledges that there was some tension between the different ethnic and religious groups in Lowell, but this idea is not what led to Lowell’s decline as a “model of industry.”

**D: Incorrect.** The details about the temporary revival of the mills during World War II do not show why Lowell is no longer considered a “model of industry.” The mills were used briefly during wartime because of an increased need for supplies, but this use of the mills was short-lived.

- 58. (250)** Let  $x$  represent the number of two-door cars that will be sold next month. Use the information in the table to set up a proportion:

$$\frac{x}{1,000} = \frac{2,250}{9,000}$$

$$x = \frac{(2,250)(1,000)}{9,000} = \frac{2,250}{9} = 250$$

- 59. (13.5)** Let  $w$  represent the width of the actual garden. Set up a proportion based on the information given:

$$\frac{w}{9} = \frac{3}{2}$$

$$w = \frac{3(9)}{2} = \frac{27}{2} = 13.5$$

- 60. (12)** The greatest possible number of children in the class is the greatest common factor of 72, 60, and 84. Write the prime factorization of each number:

$$72 = 2^3 \times 3^2$$

$$60 = 2^2 \times 3 \times 5$$

$$84 = 2^2 \times 3 \times 7$$

Then, find the factors that all three have in common, which is  $2^2 \times 3 = 12$ .

- 61. (8)** Calculate simple interest ( $y$ ) by multiplying the initial deposit ( $p$ ) by the interest rate ( $r$ ) by the number of years ( $t$ ).

$$prt = y$$

$$900(0.05)t = 360$$

$$45t = 360$$

$$t = 8$$

**62. (7)**

$$\frac{(21)(14)x}{(49)(48)} = 0.875$$

$$\left(\frac{21}{49}\right)\left(\frac{14}{48}\right)x = 0.875$$

$$\left(\frac{3}{7}\right)\left(\frac{7}{24}\right)x = 0.875$$

$$\left(\frac{1}{8}\right)x = 0.875$$

$$x = (0.875)(8) = 7$$

- 63. (A)** Add the fractions to find the answer:

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

- 64. (G)** Let  $x$  represent the distance, in kilometers, between Fran's house and Bryant State Park. Set up a proportion to solve for  $x$ :

$$\frac{x}{4.5} = \frac{3}{2} \quad \text{Cross multiply}$$

$$2x = 3(4.5) \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 2}$$

$$x = \frac{13.5}{2} = 6\frac{3}{4} \approx 7$$

- 65. (A)**  $2x + 4 = y$  Apply the additive inverse property; subtract 4 from both sides of the equation

$$2x = y - 4 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 2}$$

$$x = \frac{y - 4}{2}$$

- 66. (E)** First, subtract Luis's time from Bryan's time:  $11.74 - 11.69 = 0.05$ . Then, convert to a fraction:  $0.05 = \frac{5}{100} = \frac{1}{20}$ .

**67. (B)**  $\frac{1}{4} : 2\frac{1}{2}$   
 $\frac{1}{4} : \frac{5}{2}$   
 $4\left(\frac{1}{4}\right) : 4\left(\frac{5}{2}\right)$   
 $1 : 10$

**68. (F)**  $n = 0.13 + \frac{207}{100} = \frac{13}{100} + \frac{207}{100} = \frac{220}{100} = \frac{11}{5}$

**69. (A)** Let  $x$  represent the length of one of the 10 remaining sides.  
 $25 + 35 + 10x = 100$   
 $60 + 10x = 100$   
 $10x = 40$   
 $x = 4$

**70. (E)** After Shioh-Chen draws a yellow card and a green card, the remaining cards are 3 green, 6 yellow, and 6 red. The probability of drawing a green card from that group is:

$$\frac{3}{3+6+6} = \frac{3}{15} = \frac{1}{5}$$

**71. (D)** Let  $n$  represent a number in the sequence, and let  $x$  represent the number that comes just before  $n$ .

$$n = 3 + 2x$$

$$93 = 3 + 2x$$

$$90 = 2x$$

$$45 = x$$

**72. (H)** Let  $d$  represent the distance between the two houses, in miles. Write a proportion to solve for  $d$ :

$$\frac{d}{5.4} = \frac{3}{2}$$

$$d = \frac{3(5.4)}{2} = \frac{16.2}{2} = 8.1$$

**73. (B)** The total number of degrees in a circle is 360. The measure of the angle between adjacent spokes is  $\frac{360}{15} = 24^\circ$ .

**74. (G)** First, find the value of  $m$  for each value of  $t$ .

For  $t = 1$ :

$$1m = 72$$

$$m = 72$$

For  $t = 2$ :

$$2m = 72$$

$$m = 36$$

For  $t = 3$ :

$$3m = 72$$

$$m = 24$$

Then, add those three values together:  
 $72 + 36 + 24 = 132$

**75. (C)** First, find the area of the rectangle, in square feet:

$$16 \times 8 = 128$$

Then, find the area of the triangle:

$$\frac{1}{2} \times 4 \times 16 = 32$$

To find the area of the shaded region, subtract the area of the triangle from the area of the rectangle:

$$128 - 32 = 96 \text{ sq ft}$$

- 76. (E)** Let  $x$  represent the number of gallons of orange juice. Since the shipment contains equal amounts of the two types of juice,  $x$  also represents the number of gallons of grapefruit juice. Write an equation to solve for  $x$ :

$$2x + 3x = 250$$

$$5x = 250$$

$$x = 50$$

- 77. (C)** Let  $n$  represent the least of the five numbers. Then the next four consecutive numbers are  $(n + 1)$ ,  $(n + 2)$ ,  $(n + 3)$ ,  $(n + 4)$ . Write an equation to solve for  $n$ :

$$n + (n + 1) + (n + 2) + (n + 3) + (n + 4) = 110$$

$$5n + 10 = 110$$

$$5n = 100$$

$$n = 20$$

- 78. (H)** Since  $m$  and  $n$  are positive, the value of  $mn$  is also positive. Of the five options given:

$-mn$  is negative.

$(-m)(-n)$  is positive.

$|mn|$  is positive.

$|-mn|$  is positive.

$|(-m)(-n)|$  is positive.

There are 4 expressions that are positive, and each one is equal to  $mn$ .

**79. (A)** 
$$\frac{5^4 \times 5^6}{5^2} = \frac{5^{10}}{5^2} = 5^8$$

- 80. (G)** First, find the number of peaches sold:

$$50 - (8 + 6 + 12 + 6) = 50 - 32 = 18.$$

Then, find the percentage:

$$\frac{18}{50} = 0.36 = 36\%$$

- 81. (B)** First convert 6 inches to 0.5 feet. Then, calculate the volume, in cubic feet:

$$0.5 \times 32 \times 20 = 32 \times 10 = 320$$

- 82. (G)** Let  $p$  represent the population of Waterville in 2006. The population per square mile is:

$$\frac{p}{50} = 1,500$$

Solve for  $p$ :

$$p = 1,500(50) = 75,000$$

The population decrease from 2005 to 2006 is  $84,000 - 75,000 = 9,000$ .

- 83. (C)** According to the number line,  $y - x = 4$  and  $x + y = 24$ . Add the two equations together and solve for  $y$ :

$$y - x = 4$$

$$+ x + y = 24$$

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$$2y = 28$$

$$y = 14$$

- 84. (F)** First, find the median of set N. There are 17 integers in set N, so the 9th integer is the median. The 9th integer is 14.

The least integer in set L is equal to the median of set N, so the least integer in set L is 14.

There are 25 integers in set L, so the median is the 13th integer. That integer is 26.

**85. (D)** The ratio of  $x$  to  $y$  is 1:2, so  $\frac{x}{y} = \frac{1}{2}$  or  $x = \frac{1}{2}y$ . Similarly, the ratio of  $y$  to  $z$  is 2:5, so  $\frac{y}{z} = \frac{2}{5}$ . Solve for  $z$  in terms of  $y$ :

$$5y = 2z$$

$$\frac{5}{2}y = z$$

Use the given sum of  $x$ ,  $y$ , and  $z$  to find the value of  $y$ :

$$x + y + z = 40$$

$$\frac{1}{2}y + y + \frac{5}{2}y = 40$$

$$4y = 40$$

$$y = 10$$

**86. (F)** The sum of 4 consecutive integers can be expressed as:

$$n + (n + 1) + (n + 2) + (n + 3)$$

$$= 4n + 6$$

Set that expression equal to each of the options and solve for  $n$ :

Option E:

$$4n + 6 = -12$$

$$4n = -18$$

$$n = -\frac{18}{4} \text{ is not an integer}$$

Option F:

$$4n + 6 = -10$$

$$4n = -16$$

$$n = -4 \text{ is an integer}$$

Option G:

$$4n + 6 = -8$$

$$4n = -14$$

$$n = -\frac{14}{4} \text{ is not an integer}$$

Option H:

$$4n + 6 = -4$$

$$4n = -10$$

$$n = -\frac{10}{4} \text{ is not an integer}$$

The only option for which  $n$  is an integer answer is -10.

**87. (C)** There are 5 stores where the video game is priced at \$10.99 and a total of 5 stores where it is priced at either \$12.99 or \$13.99, so the median price must be \$11.99.

- 88. (F)** Solve  $xy = 30$ , the given equation, for  $x$ :

$$xy = 30$$

$$x = \frac{30}{y}$$

$$\text{Then } 10 \div x = 10 \div \frac{30}{y} = 10 \times \frac{y}{30} = \frac{1}{3}y$$

- 89. (B)** First, find the lengths of the given segments:

$$QR = 5\frac{1}{6} - 3 = 2\frac{1}{6}$$

$$PQ = 3 - 1\frac{1}{3} = 1\frac{2}{3}$$

Then, find the difference:

$$2\frac{1}{6} - 1\frac{2}{3} = \frac{13}{6} - \frac{5}{3} = \frac{13}{6} - \frac{10}{6} = \frac{3}{6} = \frac{1}{2}$$

- 90. (F)** Since the distance from W to X is 70% of the distance from W to Y, the distance from X to Y is 30% of the distance from W to Y. Let  $d$  represent the distance from W to Y. Then 15 miles is 30% of  $d$ .

$$0.30d = 15$$

$$d = \frac{15}{0.30} = 50$$

So, the distance from W to X, in miles, is  $50 - 15 = 35$

- 91. (D)** Multiply the numbers of highways between each pair of cities:

$$3 \times 4 \times 3 = 36$$

- 92. (G)** Take each ratio and solve for dogs:

$$\frac{p}{d} = \frac{4}{1}$$

$$4d = p$$

$$d = \frac{1}{4}p$$

And

$$\frac{d}{c} = \frac{3}{2}$$

$$d = \frac{3}{2}c$$

Set the two expressions for  $d$  equal to each other and solve for  $\frac{p}{c}$ .

$$\frac{1}{4}p = \frac{3}{2}c$$

$$p = 6c$$

$$\frac{p}{c} = \frac{6}{1}$$

So, the ratio of people to cats is 6:1.

- 93. (B)** Let  $x$  represent the side length of square T, in centimeters. Then the side length of square S is  $(x - 1)$ . The area of square S is:

$$(x - 1)(x - 1) = 9$$

$$(x - 1)^2 = 9$$

$$x - 1 = 3$$

$$x = 4$$

So the side length of square T is 4 cm, and the area of square T is 16 sq cm.

The difference between the areas, in square centimeters, is  $16 - 9 = 7$ .

- 94. (H)** If  $x$  is an odd number, then the next two odd numbers are  $(x + 2)$  and  $(x + 4)$ .

95. (A)  $\frac{1}{x} - \frac{1}{2x} = \frac{2}{2x} - \frac{1}{2x} = \frac{1}{2x}$

---

96. (G) The total number of people who participated in the competition was  $1 + 5 + 10 + 4,984 = 5,000$ . The total number who placed first, second, or third was  $1 + 5 + 10 = 16$ .

$$\frac{16}{5,000} = \frac{32}{10,000} = 0.0032 = 0.32\%$$

---

97. (B) Let  $A$  represent the measure of angle  $A$ , and let  $B$  represent the measure of angle  $B$ , in degrees. Since the angles are complementary,  $A + B = 90$ . The question states that  $B = 3A$ , or  $A = \frac{B}{3}$ . Substitute that expression for  $A$  in the first equation and solve for  $B$ .

$$A + B = 90$$

$$\frac{B}{3} + B = 90$$

$$\frac{4B}{3} = 90$$

$$4B = 270$$

$$B = 67.5$$

---

98. (G) Let  $h$  represent the height of the tree in 2003. Then the height of the tree in 2013 is  $3h$ . Calculate the percent increase:

$$\frac{3h - h}{h} = \frac{2h}{h} = 2 = 200\%$$

---

99. (B) If 1 gallon is equal to 16 cups, and 1 cup is equal to 8 fluid ounces, then

$$1 \text{ gallon} = (16)(8 \text{ fluid ounces}) = 128 \text{ fluid ounces}$$

$$128 = 2^7$$

$$1 \text{ gallon} = 2^7 \text{ fluid ounces}$$

$$\text{So, } x = 7.$$

---

100. (H) The length of one side of the puzzle is  $\sqrt{64} = 8$  inches. The length of one side of the block is  $\sqrt[3]{64} = 4$  inches.

The ratio of the side of the puzzle to the side of the block is 8:4, which reduces to 2:1.

---

101. (A) Let  $x$  represent Rosa's score on the third test, and let  $y$  represent her score on the fourth test.

$$\frac{81 + 83 + x + y}{4} = 85$$

$$164 + x + y = 340$$

$$x + y = 176$$

If Rosa scores 100 on the fourth test, then the least score she can earn on the third test is 76.

- 102. (H)** The fraction of the pizza that the Barnes family eats is  $\frac{11}{18}$ . Let  $x$  represent the number of slices of pizza that the Ramirez family eats. Then the fraction of the pizza that the Ramirez family eats is  $\frac{x}{15}$ . Write an inequality and solve for  $x$ :

$$\frac{x}{15} \leq \frac{11}{18}$$

$$x \leq \frac{11 \times 15}{18}$$

$$x \leq \frac{165}{18}$$

$$x \leq 9\frac{1}{6}$$

So, the greatest number of whole slices of pizza the Ramirez family can eat is 9.

**103. (D)**  $0^3 + 4^0 + 2^{-1} + (-1)^2$   
 $= 0 + 1 + \frac{1}{2} + 1$   
 $= 2\frac{1}{2} = 2.5$

- 104. (G)** First, find the number of comparisons. Let A, B, C, D, E, and F represent the 6 brands of soap. Then the comparisons are AB, AC, AD, AE, AF, BC, BD, BE, BF, CD, CE, CF, DE, DF, and EF. So, there are 15 comparisons. Multiply to find the total cost:
- $$15 \times \$2,000 = \$30,000$$

- 105. (D)** First, subtract the two fractions:

$$\frac{1}{10} - \frac{1}{20} = \frac{2}{20} - \frac{1}{20} = \frac{2-1}{20} = \frac{1}{20}$$

Then, divide the difference by 2 to find half the distance between the two fractions:

$$\frac{1}{20} \div 2 = \frac{1}{20} \times \frac{1}{2} = \frac{1}{40}$$

Finally, add the distance to the first point ( $\frac{1}{20}$ ) to find the halfway point:

$$\frac{1}{20} + \frac{1}{40} = \frac{2}{40} + \frac{1}{40} = \frac{2+1}{40} = \frac{3}{40}$$

- 106. (G)** First, change 6 feet to yards:

$$6 \text{ feet} \times \frac{1 \text{ yard}}{3 \text{ feet}} = 2 \text{ yards}$$

Then, multiply the dimensions of the pool to find the volume, in cubic yards:

$$20 \times 14 \times 2 = 560$$

- 107. (B)** First, list the products:

$$3 \times 4 = 12$$

$$3 \times 5 = 15$$

$$3 \times 6 = 18$$

$$3 \times 7 = 21$$

$$4 \times 5 = 20$$

$$4 \times 6 = 24$$

$$4 \times 7 = 28$$

$$5 \times 6 = 30$$

$$5 \times 7 = 35$$

$$6 \times 7 = 42$$

Of the 10 products, 3 are odd. The fraction is  $\frac{3}{10}$ .

- 108. (E)** A quotient of 10 with a remainder of 5 means the quotient is

$$10 + \frac{5}{25} = 10\frac{1}{5} = 10.20$$

**109. (C)** The perimeter (or circumference) of one of the three semicircles is  $\frac{1}{2}$  (diameter)  
 $\pi = \frac{1}{2}(2\pi) = \pi$ . Since there are 3 semicircles that make up the perimeter, the perimeter is  $3\pi$ .

**110. (E)** Each time Micha draws a card, the probability of drawing the number 5 is  $\frac{1}{5}$ . To find the probability of drawing the number 5 three times, multiply:

$$\frac{1}{5} \times \frac{1}{5} \times \frac{1}{5} = \frac{1}{125}$$

**111. (D)**  $\frac{10 \text{ meters}}{1 \text{ second}} \times \frac{3,600 \text{ seconds}}{1 \text{ hour}} \times \frac{1 \text{ foot}}{0.3 \text{ meter}} =$   
 $\frac{36,000 \text{ feet}}{0.3 \text{ hour}} = 120,000 \text{ feet/hour}$

**112. (H)**  $6.\overline{34} - 4.\overline{12} = 2.\overline{22} = 2.\overline{2}$

$x = 2.2222 \dots$  Set  $x$  equal to the repeating decimal  
 Multiply both sides by 10

$$10x = 22.2222 \dots$$

$-x = -2.2222 \dots$  Subtract  $10x$  and  $x$

$9x = 20$  Apply the multiplicative inverse properly, divide both sides by 9

$$x = \frac{20}{9}$$

**113. (C)** First, find the area of the rectangle in the graph:

$$3 \times 5 = 15$$

Then, find the areas of the two right triangles that are not shaded:

Upper triangle:

$$\frac{1}{2} \times 4 \times 3 = 6$$

Lower triangle:

$$\frac{1}{2} \times 2 \times 5 = 5$$

The area of the shaded region, in square units, is calculated by subtracting the total area of the two right triangles from the area of the rectangle:

$$15 - (6 + 5) = 15 - 11 = 4$$

**114. (H)** Let  $w$  represent the number of additional white marbles.

Set the probability of drawing a white marble equal to  $\frac{3}{5}$  and solve the equation for  $w$ :

$$\frac{16 + w}{14 + 10 + 16 + w} = \frac{3}{5}$$

$$\frac{16 + w}{40 + w} = \frac{3}{5}$$

$$5(16 + w) = 3(40 + w)$$

$$80 + 5w = 120 + 3w$$

$$2w = 40$$

$$w = 20$$

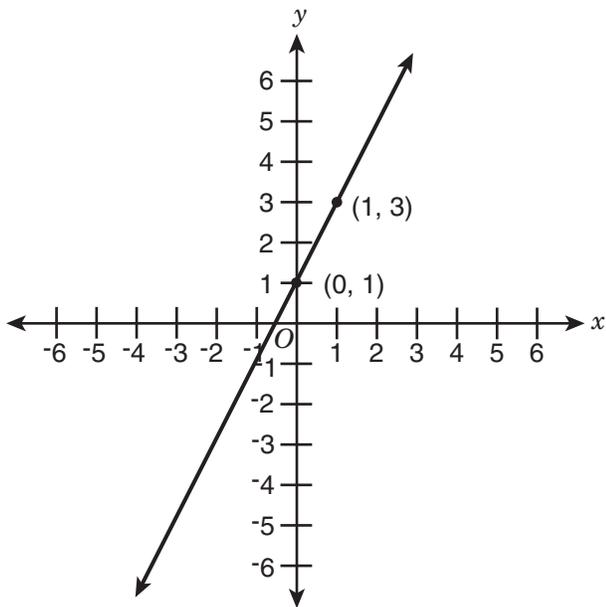
### Answer Key for Sample Form B

1. D	14. E	27. D	40. G	53. A	66. E	79. A	92. G	105. D
2. H	15. B	28. E	41. A	54. H	67. B	80. G	93. B	106. G
3. A	16. G	29. B	42. H	55. B	68. F	81. B	94. H	107. B
4. F	17. A	30. F	43. B	56. G	69. A	82. G	95. A	108. E
5. D	18. F	31. D	44. E	57. C	70. E	83. C	96. G	109. C
6. G	19. A	32. G	45. C	58. 250	71. D	84. F	97. B	110. E
7. A	20. F	33. C	46. E	59. 13.5	72. H	85. D	98. G	111. D
8. G	21. B	34. E	47. C	60. 12	73. B	86. F	99. B	112. H
9. B	22. G	35. C	48. H	61. 8	74. G	87. C	100. H	113. C
10. F	23. D	36. F	49. A	62. 7	75. C	88. F	101. A	114. H
11. D	24. F	37. D	50. F	63. A	76. E	89. B	102. H	
12. H	25. A	38. G	51. C	64. G	77. C	90. F	103. D	
13. B	26. G	39. B	52. H	65. A	78. H	91. D	104. G	

# Grade 9 Mathematics Sample Questions

Blank grids are provided on page 235.

1. A function is given on the coordinate plane.



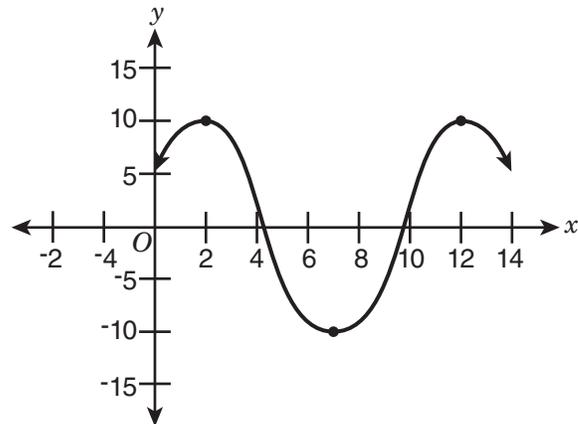
The function is linear. What is the  $y$ -value for  $x = -4$ ?

2. 
$$y = \frac{3}{2}x - 1$$

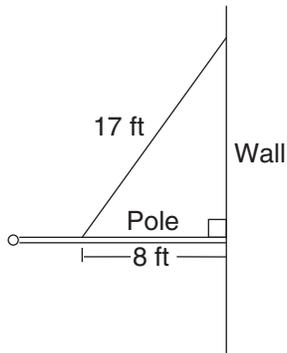
$$x + 2y = 6$$

What is the value of  $x$  in the solution to the system of equations shown above?

3. What is the difference in  $x$ -values in the graph from where the function first begins decreasing to where it begins decreasing again?



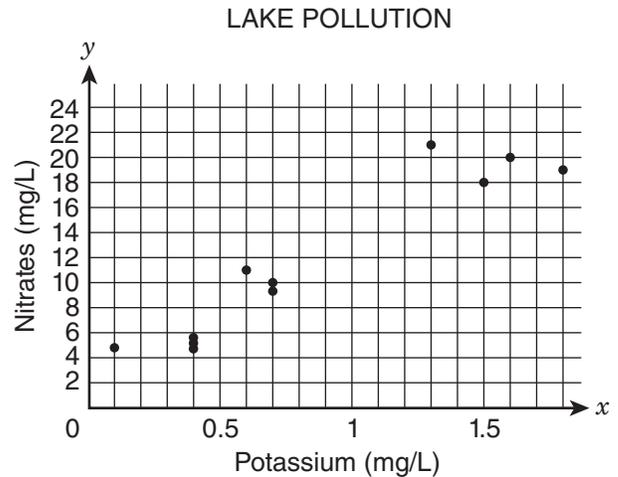
4.



The diagram above shows a pole connected to a wall at a  $90^\circ$  angle. A 17-foot wire is attached to the pole at a point 8 feet out from the wall. How many feet above the pole is the wire attached to the wall?

- A. 9
- B. 13
- C. 15
- D. 16

5. A researcher recorded pollution data that measured the presence of potassium and nitrates in some lakes. The scatter plot shows the data.



Which statement describes the data shown in the graph?

- A. The data show a nonlinear association.
- B. The data show multiple outliers.
- C. The data show a positive association.
- D. The data show a negative association.

6. How much greater is  $(1.8 \times 10^6)$  than  $(7.3 \times 10^5)$ ?

- A.  $1.07 \times 10^5$
- B.  $1.13 \times 10^5$
- C.  $1.07 \times 10^6$
- D.  $1.13 \times 10^6$

7. How is  $0.\overline{6} \times 0.\overline{2}$  written as a fraction in simplest form?

- A.  $\frac{4}{27}$
- B.  $\frac{2}{15}$
- C.  $\frac{4}{33}$
- D.  $\frac{3}{25}$

8. If  $2x - 6 = 8y - 10$  and  $x > 5$ , what is the least possible integer value of  $y$ ?

- A. 1
- B. 2
- C. 3
- D. 6

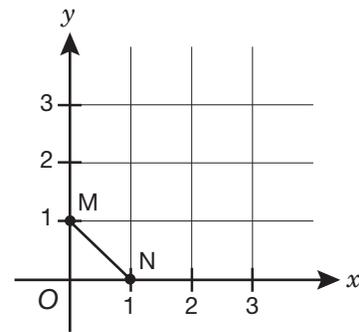
9. A data set relates a car's average gas mileage,  $y$ , in miles per gallon, to its engine size,  $x$ , in liters. The equation for the line of best fit is  $y = -3.25x + 34.5$ . What is the meaning of the slope of the line as it relates to gas mileage and engine size?

- A. For each decrease of 1 L in engine size, the gas mileage decreases by 3.25 mpg.
- B. For each increase of 1 L in engine size, the gas mileage decreases by 3.25 mpg.
- C. For each increase of 1 mpg in gas mileage, the engine size decreases by 3.25 L.
- D. For each decrease of 3.25 mpg in gas mileage, the engine size decreases by 1 L.

10. On Saturday, the temperature changed at a constant rate from 2:00 a.m. until 2:00 p.m. At 4:00 a.m., the temperature was  $47^\circ\text{F}$ . At 10:00 a.m., the temperature was  $32^\circ\text{F}$ . What was the temperature at 2:00 a.m. on Saturday?

- A.  $15^\circ\text{F}$
- B.  $37^\circ\text{F}$
- C.  $42^\circ\text{F}$
- D.  $52^\circ\text{F}$

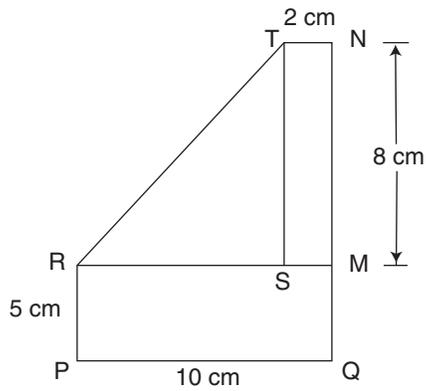
11.



If  $\overline{MN}$  is rotated  $90^\circ$  clockwise about the origin, what are the coordinates of  $N'$ ?

- A.  $(1, 0)$
- B.  $(0, 1)$
- C.  $(0, -1)$
- D.  $(-1, 0)$

12.



In the diagram above,  $STNM$  and  $PRMQ$  are rectangles, and point  $S$  is on  $\overline{RM}$ . What is the length of  $\overline{RT}$ , in centimeters?

- A. 8
- B.  $\sqrt{80}$
- C. 10
- D.  $\sqrt{128}$

13.

$$N = \sqrt{y + (2x - 1)^2}$$

In the equation shown above,  $y > 0$  and  $N \geq 0$ . What value of  $x$  will result in the **least** possible value of  $N$ ?

- A.  $-\frac{1}{2}$
- B. 0
- C.  $\frac{1}{4}$
- D.  $\frac{1}{2}$

1. (-7) The function goes through points (0, 1) and (1, 3). Use those points to determine the equation of the function:

$$\text{Slope: } \frac{3-1}{1-0} = \frac{2}{1} = 2$$

It can be determined from the graph that the y-intercept is 1.

$$\text{Equation: } y = 2x + 1$$

Now plug in  $x = -4$  to find  $y$ :

$$y = 2(-4) + 1 = -8 + 1 = -7$$

2. (2) First, solve the second equation for  $y$ :

$$x + 2y = 6$$

$$2y = 6 - x \quad \text{Apply the additive inverse property; subtract } x \text{ from both sides of the equation}$$

$$y = \frac{6-x}{2} \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 2}$$

Now set the two expressions for  $y$  equal to each other:

$$\frac{3}{2}x - 1 = \frac{6-x}{2} \quad \text{Apply the multiplicative inverse property; multiply both sides by 2}$$

$$3x - 2 = 6 - x \quad \text{Apply the additive inverse property; add } x \text{ to both sides of the equation}$$

$$4x - 2 = 6 \quad \text{Apply the additive inverse property; add 2 to both sides of the equation}$$

$$4x = 8 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 4}$$

$$x = 2$$

3. (10) The function first begins decreasing at (2, 10) and begins decreasing again at (12, 10). The difference in  $x$ -values is  $12 - 2 = 10$ .

4. (C) Let  $x$  represent the distance between the pole and the point where the wire attaches to the wall. Use the Pythagorean Theorem to find  $x$ :

$$x^2 + 8^2 = 17^2$$

$$x^2 + 64 = 289$$

$$x^2 = 225$$

$$x = \sqrt{225} = 15$$

5. (C) According to the scatter plot, as the potassium value increases, so does the nitrates value. Therefore, this is a positive association.

6. (C) In order to subtract the expressions, rewrite them so that they have the same exponent on the 10.

$$\begin{aligned} & (1.8 \times 10^6) - (7.3 \times 10^5) \\ &= (1.8 \times 10^6) - (0.73 \times 10^6) \\ &= (1.8 - 0.73) \times 10^6 \\ &= 1.07 \times 10^6 \end{aligned}$$

7. (A) Rewrite the repeating decimals as fractions:

$$x = 0.666666 \dots \quad \text{Let } x \text{ equal the repeating decimal}$$

$$10x = 6.66666 \dots \quad \text{Multiply both sides of the equation by 10 to move the decimal one place to the right}$$

$$10x = 6.6666 \dots \quad \text{Subtract the two equations}$$

$$\underline{-x = -0.6666}$$

$$9x = 6.0000 \dots \quad \text{Apply the multiplicative inverse property; divide both sides by 9}$$

$$x = \frac{6}{9} = \frac{2}{3} \quad \text{Simplify the fractions to lowest terms (if needed)}$$

Perform the same process for  $0.\overline{2}$

$$10x = 2.2222 \dots$$

$$\underline{-x = -0.2222}$$

$$9x = 2.0000 \dots$$

$$x = \frac{2}{9}$$

Then multiply:

$$\frac{2}{3} \times \frac{2}{9} = \frac{4}{27}$$

8. (B) Solve for  $x$ :

$$x = 4y - 2$$

Since  $x > 5$ , then  $4y - 2 > 5y > \frac{7}{4}$  or 1.75 since  $y$  is an integer, therefore the least possible integer value of  $y$  is 2

9. (B) The slope of the line of best fit is  $-3.25$ . Slope is  $\frac{y}{x}$ , or in this case,  $\frac{\text{gas mileage}}{\text{engine size}}$ . So, for every 1 L increase in engine size, the gas mileage decreases by 3.25 mpg.

10. (D) The problem gives two points: (4:00, 47) and (10:00, 32). Use that information to find the rate of change:

$$\frac{32 - 47}{10:00 - 4:00} = \frac{-15}{6} = \frac{-5}{2}$$

So, the temperature change was  $-\frac{5}{2}^\circ \text{F}$  each hour.

To find the temperature at 2:00 a.m., which is two hours before 4:00 a.m., subtract  $-\frac{5}{2}$  from 47 twice:

$$47 - 2\left(-\frac{5}{2}\right) = 47 + 5 = 52$$

Therefore, the temperature at 2:00 a.m. was  $52^\circ \text{F}$ .

11. (C) The new position of A ( $h, k$ ) after rotating 90 degree will become A' ( $k, -h$ ). Rotating 90° clockwise moves the line segment to the fourth quadrant. So, M' becomes (0, 1) and N' becomes (0, -1).

12. (D) Triangle RTS is a right triangle. First, find the lengths of the two legs (TS and RS). Then the Pythagorean Theorem can be used to find the length of  $\overline{RT}$ .

In rectangle STNM, TN is 2 cm, so SM is also 2 cm. Similarly, NM is 8 cm, so TS is also 8 cm.

In rectangle PRMQ, PQ is 10 cm, so RM is also 10 cm. Since  $RM = RS + SM$ , use the values of RM and SM to calculate the length of  $\overline{RS}$ , in centimeters:

$$RS + SM = RM$$

$$RS + 2 = 10$$

$$RS = 8$$

Now use the Pythagorean Theorem to find the length of:

$$(RS)^2 + (TS)^2 = (RT)^2$$

$$8^2 + 8^2 = (RT)^2$$

$$64 + 64 = (RT)^2$$

$$128 = (RT)^2$$

$$\sqrt{128} = RT$$

- 13. (D)** In order to minimize the value of N, find the least possible,  $(2x - 1)^2$ . Since this expression is squared, the least possible value is 0.

$$(2x - 1)^2 = 0 \quad \text{Take the square root of both sides of the equation}$$

$$2x - 1 = 0 \quad \text{Apply the additive inverse property; add 1 to both sides of the equation}$$

$$2x = 1 \quad \text{Apply the multiplicative inverse property; divide both sides of the equation by 2}$$

$$x = \frac{1}{2}$$

### Answer Key for Grade 9 Mathematics

- |       |       |       |
|-------|-------|-------|
| 1. -7 | 6. C  | 11. C |
| 2. 2  | 7. A  | 12. D |
| 3. 10 | 8. B  | 13. D |
| 4. C  | 9. B  |       |
| 5. C  | 10. D |       |

## Grade 8 Grid-In Sample Problems

**DIRECTIONS:** Solve each question. You can use the extra grid-in answer sheet on page 235 to record your answers. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above. **DO NOT FILL IN A CIRCLE UNDER AN UNUSED BOX. DO NOT LEAVE A BOX BLANK IN THE MIDDLE OF AN ANSWER.**

- |  |   |
|--|---|
| <p>1.                      1 dollar = 0.5 sind<br/>                            1 dollar = 26 ricks</p> <p>Tariq has 120 ricks. He wants to convert the ricks to sinds, according to the rates above. Rounding to the nearest hundredth, how many sinds will he receive for his 120 ricks? (Assume there are no exchange fees.)</p> | <p>4.     If <math>x</math> is a positive integer and <math>y</math> is a negative integer, what is the <b>greatest</b> possible value of <math>xy</math>?</p>                                    |
| <p>2.     Solve for <math>x</math>:</p> $2(x - 4) - (4x + 1) = 3$  | <p>5.     Rafiq earns 12% commission on every car he sells. Last week, Rafiq earned \$10,800 in commissions. If the cars he sold had an average price of \$18,000, how many cars did he sell?</p> |
| <p>3.     Selena earns 4% commission on every laptop she sells. The laptops at her store sell for \$800 each. If she earned \$384 in commission this week, how many laptops did she sell?</p>  | <p>6.     Solve for <math>x</math>:</p> $\frac{5 - 2x}{3} = 9$  |

---

7. A map uses a scale of 2 centimeters:15 miles. Two towns are 360 miles apart. How far apart, in centimeters, are these towns on the map?

9. Mr. Gomez bought  $x$  packages of pencils for his classroom. Each package of pencils cost \$2.50 before tax. He paid a total of \$81.00, which included 8% sales tax. How many packages of pencils did he buy?

---

8. Solve for  $x$ :

$$\frac{3x + 4}{2} = 14$$

---

10. What is the **greatest** integer less than  $-\frac{23}{7}$ ?

# Grade 8 Grid-In Explanations of Correct Answers

1. (2.31) First, use the given conversions to calculate how many sinds are in 1 rick:

$$1 \text{ dollar} = 0.5 \text{ sind}$$

$$1 \text{ dollar} = 26 \text{ ricks}$$

Since both quantities are equal to 1 dollar, set the sinds and ricks equal to each other:

$$26 \text{ ricks} = 0.5 \text{ sinds}$$

Multiply both sides by 2:

$$52 \text{ ricks} = 1 \text{ sind}$$

Tariq has 120 ricks, so:

$$\frac{120}{52} \text{ ricks} \approx 2.31 \text{ sinds}$$

Since the answer is a positive decimal, skip the first column. The response begins on the second column on the left-hand side.

	2	.	3	1
⊖	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙

2. (-6)  $2(x - 4) - (4x + 1) = 3$

Apply the distributive property; distribute the 2 through the first set of parentheses and distribute the negative sign through the second set of parentheses

$$2x - 8 - 4x - 1 = 3 \quad \text{Combine like terms}$$

$$-2x - 9 = 3 \quad \text{Apply the additive inverse property; add 9 on both sides of the equal sign}$$

$$-2x = 12 \quad \text{Apply the multiplicative inverse property; divide -2 on both sides of the equal sign}$$

$$x = -6$$

Since the answer is a negative single-digit, fill in the negative sign and the second column contains the digit, 6.

	-	6		
⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙

3. (12) Let  $x$  be the number of laptops Selena sold this week. Her commission on 1 laptop, in dollars, would be  $800(0.04)$ . Her total commission for the week is  $800(0.04)x$ . Set up an equation to solve:

$$(800)(0.04)x = 384$$

$$32x = 384$$

$$x = 12$$

Since the answer is a positive whole number, skip the first column and begin inputting your answer in the second column.

	1	2		
⊖	⊖	⊖	⊖	⊖
0	0	0	0	0
●	1	1	1	1
2	●	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

4. (-1) Since  $x$  is a positive integer,  $x = 1, 2, 3, \dots$ . Since  $y$  is a negative integer,  $y = -1, -2, -3, \dots$ . Because one factor is negative and one is positive, the value of  $xy$  must be negative. In order to find the greatest possible value of  $xy$ , we will need to find the smallest positive integer of  $x$ , which is 1 and the greatest negative integer of  $y$ , which is -1. Therefore, the value of  $xy$  is -1.

Since the answer is a negative single-digit, fill in the negative sign and the second column contains the digit, 1.

-	1			
●	⊖	⊖	⊖	⊖
0	0	0	0	0
●	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

5. (5) Let  $x$  be the number of cars Rafiq sold last week. His commission, in dollars, on 1 car would be  $18,000(0.12) = 2,160$ . His total commission is  $2,160x$ . Set up an equation to solve:

$$2,160x = 10,800$$

$$x = 5$$

Since the answer is a positive whole number, skip the first column and begin inputting your answer in the second column.

	5			
-	.	.	.	.
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

6. (-11)  $\frac{5 - 2x}{3} = 9$  Multiply both sides by 3 to eliminate the fraction

$$5 - 2x = 27$$

Apply the additive inverse property; subtract 5 from both sides of the equation

$$-2x = 22$$

Apply the multiplicative inverse property; divide both sides of the equation by -2

$$x = -11$$

Since the answer is a negative whole number, fill in the negative sign and enter the two digits in the second and third columns.

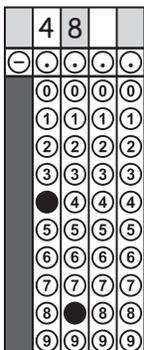
-	1	1		
.	.	.	.	.
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

7. (48) Set up a proportion to solve:

$$\frac{x \text{ cm}}{360 \text{ mi}} = \frac{2 \text{ cm}}{15 \text{ mi}}$$

$$x = \frac{2(360)}{15} = 48$$

Since the answer is a positive whole number, skip the first column and begin inputting your answer in the second column.



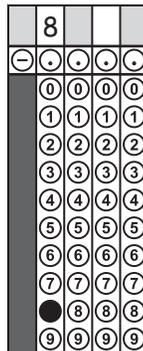
8. (8)  $\frac{3x + 4}{2} = 14$  Apply the multiplicative inverse property; multiply both sides by 2 to eliminate the fraction

$3x + 4 = 28$  Apply the additive inverse property; subtract  $-4$  from both sides of the equation

$3x = 24$  Apply the multiplicative inverse property; divide both sides of the equation by 3

$$x = 8$$

Since the answer is a positive whole number, skip the first column and begin inputting your answer in the second column.



9. (30) Set up an equation to solve. The total amount Mr. Gomez spent, in dollars, before tax is  $2.50x$ . The tax is  $(2.50x)(0.08)$ . Set up an equation to solve:

$$2.50x + 2.50x(0.08) = 81.00$$

$$2.50x + 0.2x = 81.00$$

$$2.70x = 81.00$$

$$x = 30$$

Mr. Gomez bought 30 packages of pencils.

Since the answer is a positive whole number, skip the first column and begin inputting your answer in the second column.

	3	0		
⊖	⊙	⊙	⊙	⊙
⊙	●	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
●	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	

10. (-4) First, convert the improper fraction to a mixed number:

$$-\frac{23}{7} = -3\frac{2}{7}$$

The two closest integers to this fraction are  $-4$  and  $-3$ . The integer less than  $-\frac{23}{7}$  is  $-4$ .

Since the answer is a negative single-digit, fill in the negative sign and the second column contains the digit, 4.

⊖	4			
●	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
●	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	
⊙	⊙	⊙	⊙	

### Answer Key for Grid-In Mathematics

- |         |        |
|---------|--------|
| 1. 2.31 | 6. -11 |
| 2. -6   | 7. 48  |
| 3. 12   | 8. 8   |
| 4. -1   | 9. 30  |
| 5. 5    | 10. -4 |



**1. STUDENT STATEMENT:** I am well enough to take this test and complete it. I understand that once I break the seal of the test booklet, I may not be eligible for a make-up test. I am a New York City resident and a Grade 8 student taking a Grade 8 test. I understand that a student who is not a New York City resident, who takes the test more than once in a given school year, or who takes the test at the wrong grade level will be disqualified from acceptance to any of the specialized high schools.

Signature (full name, first name first): \_\_\_\_\_

**2. TODAY'S DATE:** \_\_\_\_\_ **3. DATE OF BIRTH:** \_\_\_\_\_  
 Month Day Year Month Day Year

CAREFULLY RECORD YOUR NAME, SCHOOL CHOICES, DATE OF BIRTH, INFORMATION ABOUT THE SCHOOL WHERE YOU ARE NOW ENROLLED, AND STUDENT ID NUMBER. USE A PENCIL ONLY. INCORRECT MARKS MAY DELAY THE SCORING OF YOUR ANSWER SHEET.

**4. FIRST NAME (please print)**

A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E
F	F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L
M	M	M	M	M	M	M	M	M	M
N	N	N	N	N	N	N	N	N	N
O	O	O	O	O	O	O	O	O	O
P	P	P	P	P	P	P	P	P	P
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

**MI**

**LAST NAME (surname) (please print)**

A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E
F	F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L
M	M	M	M	M	M	M	M	M	M
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Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

**5. CHOICES OF SPECIALIZED HIGH SCHOOLS**

Indicate your school choice in order of preference.

- Fill in only one school for each choice.
- You **must** fill in a first choice school.
- Fill in only one circle in a row and only one circle in a column.

SCHOOLS	CHOICES							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Bronx Science	<input type="radio"/>							
Brooklyn Latin	<input type="radio"/>							
Brooklyn Tech	<input type="radio"/>							
HS Math, Sci., & Engineering	<input type="radio"/>							
HS American Studies/Lehman	<input type="radio"/>							
Queens Sci./York	<input type="radio"/>							
Staten Island Tech	<input type="radio"/>							
Stuyvesant	<input type="radio"/>							

**6. DATE OF BIRTH**

Month	Day	Year
<input type="radio"/> JAN	<input type="radio"/> 1 <input type="radio"/> 11 <input type="radio"/> 21	<input type="radio"/> 20 <input type="radio"/> 0 <input type="radio"/> 0
<input type="radio"/> FEB	<input type="radio"/> 2 <input type="radio"/> 12 <input type="radio"/> 22	<input type="radio"/> 1 <input type="radio"/> 1 <input type="radio"/> 1
<input type="radio"/> MAR	<input type="radio"/> 3 <input type="radio"/> 13 <input type="radio"/> 23	<input type="radio"/> 2 <input type="radio"/> 2 <input type="radio"/> 2
<input type="radio"/> APR	<input type="radio"/> 4 <input type="radio"/> 14 <input type="radio"/> 24	<input type="radio"/> 3 <input type="radio"/> 3 <input type="radio"/> 3
<input type="radio"/> MAY	<input type="radio"/> 5 <input type="radio"/> 15 <input type="radio"/> 25	<input type="radio"/> 4 <input type="radio"/> 4 <input type="radio"/> 4
<input type="radio"/> JUN	<input type="radio"/> 6 <input type="radio"/> 16 <input type="radio"/> 26	<input type="radio"/> 5 <input type="radio"/> 5 <input type="radio"/> 5
<input type="radio"/> JUL	<input type="radio"/> 7 <input type="radio"/> 17 <input type="radio"/> 27	<input type="radio"/> 6 <input type="radio"/> 6 <input type="radio"/> 6
<input type="radio"/> AUG	<input type="radio"/> 8 <input type="radio"/> 18 <input type="radio"/> 28	<input type="radio"/> 7 <input type="radio"/> 7 <input type="radio"/> 7
<input type="radio"/> SEP	<input type="radio"/> 9 <input type="radio"/> 19 <input type="radio"/> 29	<input type="radio"/> 8 <input type="radio"/> 8 <input type="radio"/> 8
<input type="radio"/> OCT	<input type="radio"/> 10 <input type="radio"/> 20 <input type="radio"/> 30	<input type="radio"/> 9 <input type="radio"/> 9 <input type="radio"/> 9
<input type="radio"/> NOV	<input type="radio"/> 31	
<input type="radio"/> DEC		

**7. SCHOOL WHERE YOU ARE NOW ENROLLED**

NAME OF SCHOOL \_\_\_\_\_

School Code

<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> K	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0
<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> M	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> Q	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> X	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3
<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> R	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4
<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> W	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
<input type="radio"/> 6	<input type="radio"/> 6		<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6
<input type="radio"/> 7	<input type="radio"/> 7		<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8		<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9		<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9

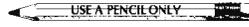
P Fill in for private or parochial schools only

**8. STUDENT ID NUMBER**

<input type="radio"/> 0					
<input type="radio"/> 1					
<input type="radio"/> 2					
<input type="radio"/> 3					
<input type="radio"/> 4					
<input type="radio"/> 5					
<input type="radio"/> 6					
<input type="radio"/> 7					
<input type="radio"/> 8					
<input type="radio"/> 9					

**9. BOOKLET LETTER AND NUMBER**

<input type="radio"/> A	<input type="radio"/> 0				
<input type="radio"/> B	<input type="radio"/> 1				
<input type="radio"/> C	<input type="radio"/> 2				
<input type="radio"/> D	<input type="radio"/> 3				
<input type="radio"/> E	<input type="radio"/> 4				
<input type="radio"/> F	<input type="radio"/> 5				
<input type="radio"/> G	<input type="radio"/> 6				
<input type="radio"/> H	<input type="radio"/> 7				
<input type="radio"/> J	<input type="radio"/> 8				
<input type="radio"/> K	<input type="radio"/> 9				
<input type="radio"/> L					
<input type="radio"/> P					
<input type="radio"/> Q					



Test Booklet Letter

Test Booklet Number

Student's First Name (please print)

Student's Last Name (please print)

**PART 1 ENGLISH LANGUAGE ARTS**

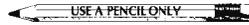
- |                    |                    |                    |                    |
|--------------------|--------------------|--------------------|--------------------|
| 1 (A) (B) (C) (D)  | 16 (E) (F) (G) (H) | 31 (A) (B) (C) (D) | 46 (E) (F) (G) (H) |
| 2 (E) (F) (G) (H)  | 17 (A) (B) (C) (D) | 32 (E) (F) (G) (H) | 47 (A) (B) (C) (D) |
| 3 (A) (B) (C) (D)  | 18 (E) (F) (G) (H) | 33 (A) (B) (C) (D) | 48 (E) (F) (G) (H) |
| 4 (E) (F) (G) (H)  | 19 (A) (B) (C) (D) | 34 (E) (F) (G) (H) | 49 (A) (B) (C) (D) |
| 5 (A) (B) (C) (D)  | 20 (E) (F) (G) (H) | 35 (A) (B) (C) (D) | 50 (E) (F) (G) (H) |
| 6 (E) (F) (G) (H)  | 21 (A) (B) (C) (D) | 36 (E) (F) (G) (H) | 51 (A) (B) (C) (D) |
| 7 (A) (B) (C) (D)  | 22 (E) (F) (G) (H) | 37 (A) (B) (C) (D) | 52 (E) (F) (G) (H) |
| 8 (E) (F) (G) (H)  | 23 (A) (B) (C) (D) | 38 (E) (F) (G) (H) | 53 (A) (B) (C) (D) |
| 9 (A) (B) (C) (D)  | 24 (E) (F) (G) (H) | 39 (A) (B) (C) (D) | 54 (E) (F) (G) (H) |
| 10 (E) (F) (G) (H) | 25 (A) (B) (C) (D) | 40 (E) (F) (G) (H) | 55 (A) (B) (C) (D) |
| 11 (A) (B) (C) (D) | 26 (E) (F) (G) (H) | 41 (A) (B) (C) (D) | 56 (E) (F) (G) (H) |
| 12 (E) (F) (G) (H) | 27 (A) (B) (C) (D) | 42 (E) (F) (G) (H) | 57 (A) (B) (C) (D) |
| 13 (A) (B) (C) (D) | 28 (E) (F) (G) (H) | 43 (A) (B) (C) (D) |                    |
| 14 (E) (F) (G) (H) | 29 (A) (B) (C) (D) | 44 (E) (F) (G) (H) |                    |
| 15 (A) (B) (C) (D) | 30 (E) (F) (G) (H) | 45 (A) (B) (C) (D) |                    |

**PART 2 MATHEMATICS**

58	59	60	61	62

- |                    |                    |                     |                     |
|--------------------|--------------------|---------------------|---------------------|
| 63 (A) (B) (C) (D) | 76 (E) (F) (G) (H) | 89 (A) (B) (C) (D)  | 102 (E) (F) (G) (H) |
| 64 (E) (F) (G) (H) | 77 (A) (B) (C) (D) | 90 (E) (F) (G) (H)  | 103 (A) (B) (C) (D) |
| 65 (A) (B) (C) (D) | 78 (E) (F) (G) (H) | 91 (A) (B) (C) (D)  | 104 (E) (F) (G) (H) |
| 66 (E) (F) (G) (H) | 79 (A) (B) (C) (D) | 92 (E) (F) (G) (H)  | 105 (A) (B) (C) (D) |
| 67 (A) (B) (C) (D) | 80 (E) (F) (G) (H) | 93 (A) (B) (C) (D)  | 106 (E) (F) (G) (H) |
| 68 (E) (F) (G) (H) | 81 (A) (B) (C) (D) | 94 (E) (F) (G) (H)  | 107 (A) (B) (C) (D) |
| 69 (A) (B) (C) (D) | 82 (E) (F) (G) (H) | 95 (A) (B) (C) (D)  | 108 (E) (F) (G) (H) |
| 70 (E) (F) (G) (H) | 83 (A) (B) (C) (D) | 96 (E) (F) (G) (H)  | 109 (A) (B) (C) (D) |
| 71 (A) (B) (C) (D) | 84 (E) (F) (G) (H) | 97 (A) (B) (C) (D)  | 110 (E) (F) (G) (H) |
| 72 (E) (F) (G) (H) | 85 (A) (B) (C) (D) | 98 (E) (F) (G) (H)  | 111 (A) (B) (C) (D) |
| 73 (A) (B) (C) (D) | 86 (E) (F) (G) (H) | 99 (A) (B) (C) (D)  | 112 (E) (F) (G) (H) |
| 74 (E) (F) (G) (H) | 87 (A) (B) (C) (D) | 100 (E) (F) (G) (H) | 113 (A) (B) (C) (D) |
| 75 (A) (B) (C) (D) | 88 (E) (F) (G) (H) | 101 (A) (B) (C) (D) | 114 (E) (F) (G) (H) |





Test Booklet Letter

Test Booklet Number

Student's First Name (please print)

Student's Last Name (please print)

**PART 1 ENGLISH LANGUAGE ARTS**

- |                    |                    |                    |                    |
|--------------------|--------------------|--------------------|--------------------|
| 1 (A) (B) (C) (D)  | 16 (E) (F) (G) (H) | 31 (A) (B) (C) (D) | 46 (E) (F) (G) (H) |
| 2 (E) (F) (G) (H)  | 17 (A) (B) (C) (D) | 32 (E) (F) (G) (H) | 47 (A) (B) (C) (D) |
| 3 (A) (B) (C) (D)  | 18 (E) (F) (G) (H) | 33 (A) (B) (C) (D) | 48 (E) (F) (G) (H) |
| 4 (E) (F) (G) (H)  | 19 (A) (B) (C) (D) | 34 (E) (F) (G) (H) | 49 (A) (B) (C) (D) |
| 5 (A) (B) (C) (D)  | 20 (E) (F) (G) (H) | 35 (A) (B) (C) (D) | 50 (E) (F) (G) (H) |
| 6 (E) (F) (G) (H)  | 21 (A) (B) (C) (D) | 36 (E) (F) (G) (H) | 51 (A) (B) (C) (D) |
| 7 (A) (B) (C) (D)  | 22 (E) (F) (G) (H) | 37 (A) (B) (C) (D) | 52 (E) (F) (G) (H) |
| 8 (E) (F) (G) (H)  | 23 (A) (B) (C) (D) | 38 (E) (F) (G) (H) | 53 (A) (B) (C) (D) |
| 9 (A) (B) (C) (D)  | 24 (E) (F) (G) (H) | 39 (A) (B) (C) (D) | 54 (E) (F) (G) (H) |
| 10 (E) (F) (G) (H) | 25 (A) (B) (C) (D) | 40 (E) (F) (G) (H) | 55 (A) (B) (C) (D) |
| 11 (A) (B) (C) (D) | 26 (E) (F) (G) (H) | 41 (A) (B) (C) (D) | 56 (E) (F) (G) (H) |
| 12 (E) (F) (G) (H) | 27 (A) (B) (C) (D) | 42 (E) (F) (G) (H) | 57 (A) (B) (C) (D) |
| 13 (A) (B) (C) (D) | 28 (E) (F) (G) (H) | 43 (A) (B) (C) (D) |                    |
| 14 (E) (F) (G) (H) | 29 (A) (B) (C) (D) | 44 (E) (F) (G) (H) |                    |
| 15 (A) (B) (C) (D) | 30 (E) (F) (G) (H) | 45 (A) (B) (C) (D) |                    |

**PART 2 MATHEMATICS**

58	59	60	61	62

- |                    |                    |                     |                     |
|--------------------|--------------------|---------------------|---------------------|
| 63 (A) (B) (C) (D) | 76 (E) (F) (G) (H) | 89 (A) (B) (C) (D)  | 102 (E) (F) (G) (H) |
| 64 (E) (F) (G) (H) | 77 (A) (B) (C) (D) | 90 (E) (F) (G) (H)  | 103 (A) (B) (C) (D) |
| 65 (A) (B) (C) (D) | 78 (E) (F) (G) (H) | 91 (A) (B) (C) (D)  | 104 (E) (F) (G) (H) |
| 66 (E) (F) (G) (H) | 79 (A) (B) (C) (D) | 92 (E) (F) (G) (H)  | 105 (A) (B) (C) (D) |
| 67 (A) (B) (C) (D) | 80 (E) (F) (G) (H) | 93 (A) (B) (C) (D)  | 106 (E) (F) (G) (H) |
| 68 (E) (F) (G) (H) | 81 (A) (B) (C) (D) | 94 (E) (F) (G) (H)  | 107 (A) (B) (C) (D) |
| 69 (A) (B) (C) (D) | 82 (E) (F) (G) (H) | 95 (A) (B) (C) (D)  | 108 (E) (F) (G) (H) |
| 70 (E) (F) (G) (H) | 83 (A) (B) (C) (D) | 96 (E) (F) (G) (H)  | 109 (A) (B) (C) (D) |
| 71 (A) (B) (C) (D) | 84 (E) (F) (G) (H) | 97 (A) (B) (C) (D)  | 110 (E) (F) (G) (H) |
| 72 (E) (F) (G) (H) | 85 (A) (B) (C) (D) | 98 (E) (F) (G) (H)  | 111 (A) (B) (C) (D) |
| 73 (A) (B) (C) (D) | 86 (E) (F) (G) (H) | 99 (A) (B) (C) (D)  | 112 (E) (F) (G) (H) |
| 74 (E) (F) (G) (H) | 87 (A) (B) (C) (D) | 100 (E) (F) (G) (H) | 113 (A) (B) (C) (D) |
| 75 (A) (B) (C) (D) | 88 (E) (F) (G) (H) | 101 (A) (B) (C) (D) | 114 (E) (F) (G) (H) |











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