

2018-2019

Specialized High Schools Student Handbook

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

The Bronx High School of Science

The Brooklyn Latin School

Brooklyn Technical High School

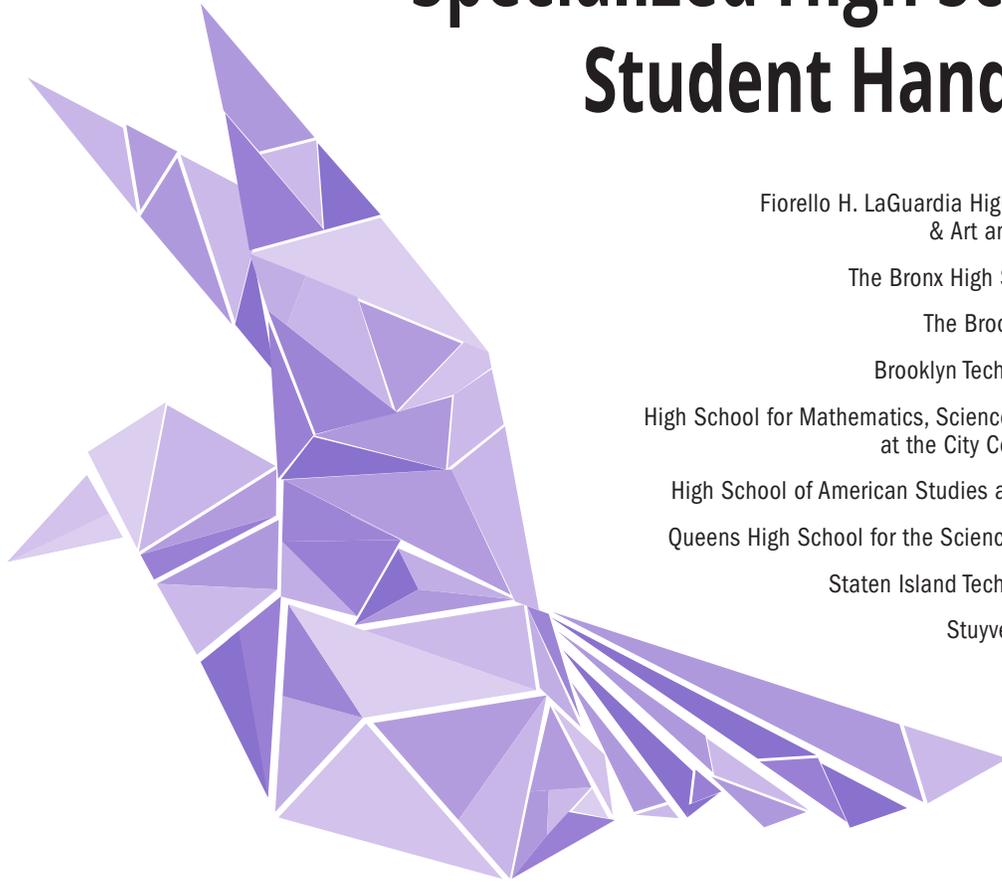
High School for Mathematics, Science and Engineering
at the City College of New York

High School of American Studies at Lehman College

Queens High School for the Sciences at York College

Staten Island Technical High School

Stuyvesant High School



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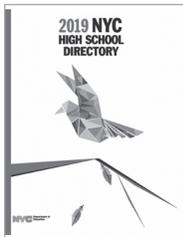
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schools.nyc.gov/SHS



ABOUT THE COVER

Student: Badiallo Diawara | **Teacher:** Evelyn Loveras | **Principal:** Moses Ojeda

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 Badiallo Diawara, a student at Thomas A. Edison Career and Technical Education High School. Badiallo's design is inspired by NYC middle school students taking flight, exploring, and finally landing at the high schools that feel right for them. For more information, including how to enter next year's competition, ask your art teacher or visit schools.nyc.gov/CoverDesign.

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MESSAGE TO STUDENTS AND PARENTS/GUARDIANS ABOUT SPECIALIZED HIGH SCHOOLS ADMISSIONS

This 2018-2019 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
- Sample SHSAT tests with test-taking tips

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

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

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.

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

THE BRONX HIGH SCHOOL OF SCIENCE

75 Bronx Science Boulevard, Bronx, New York 10468

Phone: (718) 817-7700 ■ **Website:** www.bxscience.edu

Email: golanc@bxscience.edu

Overview: The Bronx High School of Science educates an academically gifted community of learners through a rigorous science, technology, engineering, and mathematics (STEM) curriculum. All academic disciplines are taught through the lens of inquiry to emphasize critical thinking and problem solving. The school cultivates a diverse community of lifelong learners who discover their passions through a collaborative and supportive network of students, educators, and alumni. Utilizing a balance of theoretical and applied learning, students explore complex problems and have access to a rich offering of resources to develop solutions. Drawing upon a long tradition of academic success, The Bronx High School of Science prepares students to flourish in the best colleges and universities. The school creates the leaders and visionaries of the future. Included among the school's alumni are eight Nobel Prize winners and six Pulitzer Prize winners.

Academic program: The Bronx High School of Science offers 30 Advanced Placement (AP) courses and many post-AP courses (second-year college courses). The school offers six foreign languages, numerous electives in biology, chemistry, physics, mathematics, technology, the humanities, music and a three-year independent research course in STEM or social science. Students may also select sequences in computer science and engineering that emphasize hands-on applications of scientific principles. The school's website provides full course descriptions.

Extracurricular activities: Extracurricular activities include over 70 after-school clubs, 43 athletic teams, an internationally acclaimed speech and debate team, Model UN, mock trial team, two robotics teams, two theatrical productions, SING, Science Olympiad, Junior Achievement, programming club, makerspace, two hackathons, a newspaper and yearbook, scholarly journals and more. Check our website for details.

2018 Admissions: 19,715 students listed Bronx Science as a choice on the SHSAT, and 912 offers were made.

THE BROOKLYN LATIN SCHOOL

223 Graham Avenue, Brooklyn, New York 11206

Phone: (718) 366-0154 ■ **Website:** www.brooklynlatin.org

Email: parents@brooklynlatin.org

Overview: Modeled after the prestigious Boston Latin school and founded in 2006, The Brooklyn Latin School (TBLS) provides a liberal arts curriculum, with an emphasis on the

Classics and Latin language instruction. Early instruction emphasizes the acquisition of core knowledge of the key academic disciplines that students use as a foundation for deeper exploration in the upper grades. Widely regarded around the world as the most rigorous and comprehensive course of study at the high school level, the International Baccalaureate (IB) Programme is integral to the TBLS curriculum. In all classes, students experience a strong and consistent emphasis on structured writing and public speaking, as well as numerous opportunities for analytical thinking, which prepares them for the challenges of college work.

Academic program: All students are required to complete four years of study in Latin, history, mathematics, English, and science, at least two years of a world language, and one year of art history. Many of our classes feature public speaking exercises such as Declamation and Socratic Seminars, as well as oral presentations of scientific labs and mathematical problem sets. In addition, many of our classes feature writing exercises such as science lab reports, Spanish portfolios and essays, math modeling papers, and Latin sight translations. The IB Programme's emphasis on student-led inquiry, global perspectives, international mindedness, and personal integrity conform perfectly with the ideals on which the school was founded. In addition to rigorous class work, IB emphasizes independent thinking and community engagement. In order to earn the IB Diploma, students are expected to complete an independent research project that culminates in a 4,000-word essay paper on a subject of choice, a task which correlates closely to college-level research writing. They are required to take a two year epistemology course called Theory of Knowledge (TOK) that challenges students to consider the ways knowledge is constructed, and which culminates in a final research paper and presentation. In addition, students are required to engage in activities involving creativity, service, and reflection over an 18-month period. Creativity, action, and service (CAS) may include volunteering or engaging meaningfully with the TBLS community and the larger community. These requirements of the IB Diploma help our students become well-rounded citizens of the world.

Extracurricular activities: To provide enrichment for students outside of the classroom, and to facilitate the completion of their CAS requirements, TBLS currently supports over 40 extracurricular activities, including athletic teams such as coed cross country, soccer, boys and girls basketball, boys wrestling, and girls volleyball clubs; fine and performing arts offerings such as studio art, photography, literary magazine, dance, and a cappella; and various other groups such as the school newspaper, STOKED, Math Club, Science Olympiad, Model United Nations, Law Club, and many more. TBLS also has student organizations such as Asian Student Association,

Black Student Association, Feminist Student Union, Muslim Student Association, National Honors Society, and GSA.

2018 Admissions: 17,111 students listed The Brooklyn Latin School as a choice on the SHSAT, and 582 offers were made.

BROOKLYN TECHNICAL HIGH SCHOOL

29 Fort Greene Place, Brooklyn, New York 11217

Phone: (718) 804-6400 ■ **Website:** www.bths.edu

Email: info@bths.edu

Overview: With approximately 6,000 students, Brooklyn Technical High School (Brooklyn Tech) is the largest public high school devoted to science, technology, engineering, and mathematics (STEM). Many of Brooklyn Tech's facilities have been reborn for the 21st century. Our school has computer rooms configured to teach digital design and are equipped with 3D printers. Brooklyn Tech has a full-scale moot court and a forensics science laboratory. There are state-of-the-art labs in manufacturing and robotics, digital media, DNA and genetics, environmental science inclusive of a greenhouse, building construction in which a two-story building is created, architecture, and aeronautics (with an industry standard flight simulator). The school is a national model for excellence and has a stimulating environment that fosters transformational education and personal growth. Through input from its STEM partners, our labs and classrooms are on par with university and industry standards. The very active Brooklyn Tech Alumni Foundation enriches the culture of the school, supports student and faculty initiatives and is an incubator for new school programs. Graduates go on to the finest colleges and universities. They are found in every facet of society. Graduates invented the digital camera, contributed to the development of the internet, and helped put humans on the moon. They are innovators and entrepreneurs. Brooklyn Tech graduates have won Nobel prizes and occupy prominent positions in industries, engineering firms, corporations, government, academia, and research institutions.

Academic program: In the ninth grade, all students take Design and Drawing for Production, which is a foundational course through Project Lead the Way. This class immerses students in the design process, from brainstorming to prototyping through 3D printing. Students use industry standard 3D modeling software (Autodesk Inventor) to complete both individual and team-oriented projects. In addition, all ninth graders take advisory to assist them in their transition to Brooklyn Tech. In the 10th grade, all students take AP Principles of Computer Science. For the 11th and 12th grades, Brooklyn Tech students choose one of the following major areas of concentration: Aerospace, Architecture, Biological Sciences, Chemistry, Civil Engineering, College Prep, Finance, Electrical Engineering, Environmental Science, Gateway to Medicine, Industrial Design,

Law & Society, Mathematics, Mechatronics & Robotics, Media & Digital Animation, Pharmacy (doctoral pipeline program in partnership with Long Island University), Physics, Social Science Research, or Software Engineering. In addition, the school offers unique electives in performance-based instrumental and choral music. There are post-AP classes in the sciences and mathematics. Student research projects are supported through the Weston Research Scholars Program.

Extracurricular activities: Brooklyn Tech's unparalleled learning environment has over 160 clubs and activities that appeal to diverse student interests, talents, and culture. The school has one of the most extensive PSAL programs including 43 athletic teams. By the end of January 2018, Tech already earned three city championships in Girls' Tennis, Boys' Fencing, and Girls' Cross-Country. Each year the fall play and Spring musical are student activity highlights. Partners in industry and higher education help sustain the level of excellence through educational enrichment, internships, mentoring and more.

2018 Admissions: 24,163 students listed Brooklyn Tech as a choice on the SHSAT, and 1,904 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

Email: info@hsmse.org

Overview: Founded in September 2002, The High School for Mathematics, Science and Engineering (HSMSE) at The City College of New York (CCNY) provides a unique and unparalleled collaborative educational experience. The school's mission is to encourage students to develop the habits of inquiry, written and verbal expression, and critical thinking. HSMSE enrolls approximately 500 students, drawn from all five boroughs, making it one of the most ethnically diverse schools in New York City. The academically rigorous learning environment focuses on mathematics, science, and engineering, while emphasizing civic responsibility and the value of acquiring knowledge for its own intrinsic reward. HSMSE faculty work together regularly to plan lessons, develop curricula, and share best practices. Their deep professional and personal experiences enrich the learning community; many faculty members have earned doctorates, and all have advanced degrees. Many have distinguished themselves in business, engineering, and other fields prior to becoming teachers.

HSMSE staff conduct individual and group counseling sessions regularly, and coordinate the Big Sib / Little Sib Program that connect upperclassmen to serve as peer mentors to underclassmen. Through a partnership with The New York Foundling, HSMSE has a Health and Wellness Center with a

full-time mental health clinician. HSMSE sponsors workshops that have an overall theme and industry partners, who provide speakers from different departments to offer a comprehensive perspective of a particular job or company. Students who participate can apply for summer research, apprenticeship, and/or employment opportunities in the partnering company.

Academic program: HSMSE faculty plan lessons that include student discussion and cooperative learning to develop and improve problem-solving skills. All students take four years of math and science courses. Core classes meet every other day for 90 minutes, allowing time to engage in hands-on activities and in-depth discussions. Students attend a 45-minute elective enrichment course daily; course options include: gastronomy, astronomy, Microsoft Office User Certification, art, poetry writing, jazz band, and classical guitar. There are three major concentrations that students select from in the spring of their sophomore year: mathematics, Mount Sinai Medical Biomedical Research Program, or engineering. HSMSE has the largest German language program in New York State. College credit courses are offered in multiple ways: Advanced Placement courses are offered to all, and City University of New York (CUNY) courses are offered to eligible students through the CCNY partnership and the CUNY College Now program. At HSMSE, we strive to educate the whole child; therefore, in addition to stellar academic support services, HSMSE offers a Health and Wellness Center with a full-time mental health clinician to meet the socio-emotional needs of our students.

Extracurricular activities: CCNY's Baskerville Hall faces the college quad, giving students green space to eat lunch, socialize, and relax on sunny days. Students may participate in a wide variety of extracurricular activities and PSAL sports after school, including Junior Statesmen of America, EatNYC, Euro-Challenge, Fed-Challenge, Science Olympiad, Robotics Club, and the Key Club International. Additionally, HSMSE offers ping-pong, volleyball, dance, cheerleading, and Strategy Games clubs. HSMSE students compete in national competitions, sponsored by the Goethe Institute and American Association of Teachers of German, for study abroad opportunities to Germany. Every year, at least one HSMSE student competes successfully enough to earn two weeks free travel to Germany. During the school year, HSMSE sponsors trips to colleges such as Boston College, Massachusetts Institute of Technology, Princeton, Brown, and University of Michigan.

2018 Admissions: 19,856 students listed HSMSE at CCNY as a choice on the SHSAT, and 149 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

Email: atrebofiore@schools.nyc.gov

Overview: The High School of American Studies at Lehman College (HSAS) emphasizes the study of American History and offers students a well-rounded academic program that aims to prepare students for admission to highly competitive colleges and for a range of careers in politics, law, journalism, business, science, mathematics, and the arts. In all endeavors, HSAS seeks to encourage in students a love for learning and an inquisitive spirit.

Academic program: All students engage in a three-year chronological study of American History. Our aim is to make history come alive through the use of primary source documents, films, biographies, literature, and creative teaching techniques. Supported by the Gilder-Lehrman Institute, students gain first-hand knowledge of the key events in American history through trips to sites and cities of historic importance and through participation in special seminars with guest speakers. We also offer honors-level, Advanced Placement, and elective courses in mathematics, science, constitutional and criminal law, literature, film, foreign languages, history, and the arts. A special component of our program focuses on the development of college-level research skills and methodologies, and students are therefore supported by school and college faculty in the process of pursuing individualized research projects. Through our collaboration with Lehman College, students have access to its campus library and athletic facilities and take credit-bearing college classes and seminars in their junior and senior years.

Extracurricular activities: After school, students may participate in a wide variety of clubs, join one of the school's many athletic teams, and take part in competitive activities, such as moot court, mock trial, debate, and Model UN.

2018 Admissions: 17,238 students listed HSAS at Lehman College as a choice on the SHSAT, and 141 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

Email: BWittstruck@schools.nyc.gov

Overview: Queens High School for the Sciences at York College is dedicated to preparing students for college and career by providing them with a rigorous curriculum that emphasizes the sciences and mathematics. The school philosophy is to educate the "whole child." In addition to the emphasis on academics,

there is a strong focus on the liberal arts and on the development of students' interpersonal, intrapersonal, collaborative, and communication skills. Ultimately, we believe that through academic preparation and emphasis on the soft skills, students will become lifelong learners and independent thinkers and make tremendous contributions to our society.

Academic program: Course offerings vary from year to year. All courses are offered at an advanced or honors level. There is an extensive course offering program consisting of Advanced Placement opportunities in all the disciplines such as Biology, Calculus AB, Calculus BC, Chemistry, Chinese, English Language and Composition, Environmental Science, Physics, Spanish, U.S. History, Physics C and World History. The school offers a variety of elective courses in all the subject areas, as well as art, music, and language. Additionally, students have an opportunity to participate in science and math research courses in which they are mentored by college professors. Opportunities to enroll in City University of New York (CUNY) College Now courses, such as Biology, Sociology, Health Services, Nutrition and Health, Pre-Calculus, and Psychology are also available. Within this nurturing environment, students are further supported by their teachers, counselors, and peers.

Extracurricular activities: Since the school is located on the campus of York College, students enjoy state-of-the-art facilities such as the college's library, gymnasium, pool, theater, and cafeteria/food court throughout their high school career. A variety of clubs (determined by student suggestion and staff capacity) are available to all students, including debate, Amnesty International, No Place for Hate, Veritas (literary magazine), Key Club, robotics, basketball, photography, and many others. Students have opportunities to participate in internships, community service, science, mathematics, and art competitions. Boys and Girls Swimming, Girls Bowling, and Coed Tennis and Handball comprise the school's athletic teams.

2018 Admissions: 16,823 students listed Queens High School for the Sciences at York College as a choice on the SHSAT, and 151 offers were made.

STATEN ISLAND TECHNICAL HIGH SCHOOL

485 Clawson Street, Staten Island, New York 10306

Phone: (718) 667-3222 ■ Website: www.siths.org

Email: BMalenfant@schools.nyc.gov

Overview: Staten Island Technical High School's college preparatory curriculum provides a robust liberal arts curriculum that includes courses in science, technology, engineering, arts, and mathematics (STEAM), and a cutting edge Career and

Technical Education (CTE) program. All students participate in the highly innovative 1:1 - BYOD Digital Education Initiative. Over 60% of the faculty members teach Advanced Placement (AP) and other college level courses.

Academic program: Students advance beyond the core curriculum by taking four years of mathematics and a wide array of STEAM, AP, and Dual-Enrollment courses in all subject areas, along with the option of participating in the Science & Engineering Research Program, in which students compete in the NYC Science and Engineering Fair, Regeneron Science Talent Search, Google, and Quality of Life competitions. All ninth grade students take an Intensive Writing course and College Board's Common Core-aligned SpringBoard English Language Arts curriculum, which prepares all students for AP Language and AP Literature and Composition curricula, as well as the SAT. All students graduate with at least two or three AP Social Studies courses and take three years of Russian language.

The Pre-Engineering STEAM program features Robotics, AutoCAD, Digital-Analog Electronics, TV Studio Engineering, IT Mouse Squad, and Computer Science courses as well as an extensive Work Based Learning (WBL) College and Career Exploration sequence featuring career talks, job shadowing, career and college fairs, as well as internships. All students participate in the Pre-Engineering STEAM program.

Partnerships with CUNY College Now, SUNY University in the High School, St. John's University College Advantage and the College of St. Rose provide students with the opportunity to earn and graduate with 15 to 60 college credits.

Extracurricular activities: The extracurricular program features over 100 afterschool clubs and activities (e.g., robotics, debate, Science/Russian Olympiad) and 46 PSAL teams. The Student Organization, National Honor Society and Junior Statesmen of America serve as the pipeline for our student leaders, while students interested in the arts can participate in nine different bands, including jazz, marching band and ensembles, as well as theatrical productions.

2018 Admissions: 16,007 students listed Staten Island Technical High School as a choice on the SHSAT, and 326 offers were made.

STUYVESANT HIGH SCHOOL

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

Phone: (212) 312-4800 ■ Website: www.stuy.edu

Email: 02M475@schools.nyc.gov

Overview: Stuyvesant High School's mission is to provide students with a rigorous curriculum that nurtures and rewards

their intellectual curiosity. Although Stuyvesant is historically recognized for its strengths in math, science, and technology instruction, the school also has a dynamic and diverse humanities program, as well as unique educational opportunities outside the classroom.

Academic program: The school's enriched curriculum includes required courses for graduation and also affords its students the opportunity to take many advanced courses and electives in various subjects. These course selections include Science Research, Multivariate Calculus, Organic Chemistry, Existentialism, Engineering, and Genetics, in addition to a wide array of Advanced Placement courses.

Extracurricular activities: The school is proud of its 42 PSAL sports teams and extensive extracurricular activities such as Robotics, Math Team, Speech and Debate, Science Olympiad, Chess, Model UN, and Junior State of America. There are a number of major publications, over 190 student-run clubs, and an active student government. Students interested in music and art may participate in one of 12 musical ensembles, including symphonic band, symphony orchestra, jazz band, and a number of choral groups, as well as join the Stuyvesant Theater Community, which presents three major productions yearly, including a musical, drama, and comedy.

2018 Admissions: 23,067 students listed Stuyvesant High School as a choice on the SHSAT, and 902 offers were made.

FIORIELLO H. LAGUARDIA HIGH SCHOOL OF MUSIC & ART AND PERFORMING ARTS

100 Amsterdam Avenue, New York, New York 10023

Phone: (212) 496-0700 ■ **Website:** www.laguardiahs.org

Email: admissions@laguardiahs.org

The Fiorello H. LaGuardia High School of Music & Art and Performing Arts enjoys an international reputation as the first and foremost high school committed to nurturing students dedicated to the arts. LaGuardia High School's dual mission provides a uniquely balanced educational experience that includes both demanding conservatory-style training and a rigorous, comprehensive academic program.

Studio Programs: Students in the **Dance** program study ballet and modern dance; supplementary courses include professional skills, dance history, choreography, theater dance (tap and jazz), career management, and repertory. Students in the **Drama** program focus on theater preparation through courses in acting, voice and diction, physical techniques, theater history, musical theater, acting on film, and script analysis. Students in the **Fine Arts** program receive the first two years of training in traditional and foundational skills and media. These include, but are not limited to, drawing, painting

in water-based media, graphic design, and painting in oils and acrylics. After taking the core art courses, students round out their arts education with advanced courses in the subjects listed above and with other elective offerings, such as architecture, art history, ceramics, computer graphics, mural painting, photography, print making, and sculpture. Students in the **Technical Theater** program receive practical training in scenic carpentry, lighting technology, costume construction, sound properties, stage management, technical drawing, and design. Upon successful completion of this program, students may receive a Career and Technical Education (CTE) endorsed diploma. Technical Theater students participate in both the production and the performance aspects for various LaGuardia High School events. Students in the **Instrumental Music** program study sight singing, music theory, and music history. The Instrumental Music Studio performing groups include Senior Orchestra, Junior Orchestra, Intermediate Orchestra, Elementary Orchestra, Senior Band, Junior Band, Intermediate Band, Senior Jazz Band, Junior Jazz Band, and two Pit Orchestras. Students in the **Vocal Music** program study sight-singing, music theory, and music history. Studio performing groups include Elementary, Mixed, Girls, Women's, and Senior Choruses. In voice classes, students receive training in Italian, German, and French vocal literature. Both Vocal and Instrumental Music elective courses include Chamber Music, Guitar, Soundlab Recording Studio, Music Technology, New Music Ensemble, Show Choir, Solo Voice, Audition Preparation, Gospel Choir, Piano, Songwriting, and an Opera production. Students also have the opportunity to compose, conduct, and perform original repertoire.

Each studio requires a substantial time commitment after school, in addition to multiple periods of study during the school day. Requirements include, but are not limited to, rehearsals and performances, as well as the practical application of technical theater and gallery management techniques. Longer school days are expected during performance times, and students are required to be present and participate in program-related, after-school performances and activities. Upon successful completion of graduation requirements, studio coursework, and examinations, students may receive the Chancellor's Arts Endorsement.

Auditions will be held at the LaGuardia High School campus in Manhattan. Students must register for auditions with their school counselors. See pages 14-16 for LaGuardia High School audition information.

Academic program: LaGuardia High School students exceed the NYC Department of Education's College and Career Readiness Benchmarks. These benchmarks, as outlined by the DOE, define the qualities and achievements that students need to complete in order to be ready to enroll, persist, and

succeed in college, postsecondary training opportunities, and gain entry into meaningful careers. The school's rigorous academic program includes required courses for graduation, CUNY College Credit Bearing Courses, as well as over 24 Advanced Placement (AP) courses in the following subjects: Art History; Biology; Calculus AB and BC; Chemistry; Computer Science Principles; English Language; English Literature; Environmental Science; Government & Politics; Human Geography; Language and Culture in Italian, French, and Spanish; Music Theory; Physics; Psychology; Statistics; Studio Art Drawing and 2-D; US History; and World History.

Students complete this course load in addition to their studio majors.

Extracurricular activities: Students actively engage in 22 PSAL sports teams and an extensive array of extracurricular activities such as Math Team, Science Olympiad, GSA, and ARCHON and ARISTA Honor Societies. Students participate in over 50 student-run clubs and student government.

2018 Admissions: 1,015 students received one or more offers to the programs at LaGuardia High School from a pool of 11,881 students who registered for an audition.

SPECIALIZED HIGH SCHOOLS ADMISSIONS TEST SHSAT DATES AND LOCATIONS

All eligible current 8th and first-time 9th grade students in public, private, and parochial schools applying to one or more of New York City’s Specialized High Schools (with the exception of LaGuardia High School) must take the SHSAT. Approximately 28,000 students took the SHSAT for September 2018 admission.

Students interested in taking the SHSAT should speak with their school counselor during the registration period.

Students will be issued a Test Ticket, which will indicate the date, time, location and testing accommodations (if applicable) assigned to the student for testing.

Students must test on the date and at the location assigned. Testing locations are specified on page 12, and students are assigned to a test site based on the geographic district in which the student’s school is located. Please report conflicts to your child’s school counselor as soon as possible. See below for information on make-up requests.

September 6 – October 11, 2018

Registration Period

October 17, 2018

Test Tickets available for distribution

TEST DATES (For locations, see page 12)

■ All current 8th grade students	Saturday, October 20, 2018
■ All current 8th grade students ■ All first-time 9th grade students	Sunday, October 21, 2018
■ SHSAT School Day pilot	Thursday, November 1, 2018
■ Current 8th and first-time 9th grade students who are English Language Learners or students with disabilities who have Individualized Education Programs (IEPs) or 504 Plans that include testing accommodations.* ■ Make-up test requests	Saturday, November 3, 2018 Sunday, November 18, 2018
■ Students new to New York City (Records must show that student arrived in NYC after the November test.)	End of summer 2019

ALTERNATE TEST DATE

- Students must notify their school counselors within the registration period if they require a test date that does not conflict with a Saturday or Sunday religious observance. If a student’s Test Ticket does not indicate an appropriate date, the student should speak to their school counselor so that the ticket can be modified.
- Students whose test conflicts with their LaGuardia High School audition should refer to Audition Exceptions on page 14.
- If a student is ill and unable to take the test on a scheduled date, the student must immediately notify their school counselor upon return to school, present medical documentation, and request that the school counselor provide a make-up testing date.
- Documentation is required to confirm a valid make-up request. School counselors must submit requests with required documentation by October 31 for the November 3 test and by November 14 for the November 18 test.

*More information about eligible English Language Learners and former English Language Learners is on page 18.

SHSAT DATES AND LOCATIONS *continued...*

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

Note: Not every site will be available on November 18. Please check your Test Ticket for precise testing location.

SHSAT DATES AND LOCATIONS *continued...*

TEST RESULTS

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 upon their SHSAT scores, how they ranked the Specialized High Schools on the SHSAT answer sheet, and seat availability. SHSAT scores are available in March 2019 with High School Admissions Round One results. 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 page 23 for more information about listing choices.
- Then, all scores of the students who took the test are ordered from highest score to lowest score.
- The student with the highest 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.

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

FIORIELLO H. LAGUARDIA HIGH SCHOOL OF MUSIC & ART AND PERFORMING ARTS AUDITIONS

SECTION



September 7 – October 11, 2018

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

October 17, 2018

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–L	Students auditioning for Dance	Saturday, November 03, 2018	8:00 AM
Bronx	M–Z	Students auditioning for Dance	Sunday, November 04, 2018	8:00 AM
Bronx	A–Z	Students auditioning for a single or multiple studios except Dance	Saturday, December 01, 2018	8:00 AM
Brooklyn	A–Z	Students auditioning for two or more studios or Technical Theater	Saturday, October 27, 2018	8:00 AM
Brooklyn	A–L	Students auditioning for a single studio except Technical Theater	Sunday, October 28, 2018	8:00 AM
Brooklyn	M–Z	Students auditioning for a single studio except Technical Theater	Sunday, October 28, 2018	11:30 AM
Manhattan	A–Z	Students auditioning for two or more studios or Technical Theater	Saturday, November 03, 2018	8:00 AM
Manhattan	A–L	Students auditioning for a single studio except Technical Theater	Sunday, November 04, 2018	8:00 AM
Manhattan	M–Z	Students auditioning for a single studio except Technical Theater	Sunday, November 04, 2018	11:30 AM
Queens/ Staten Island	A–Z	Students auditioning for two or more studios or Technical Theater	Saturday, November 17, 2018	8:00 AM
Queens/ Staten Island	A–K	Students auditioning for a single studio or Technical Theater	Sunday, November 18, 2018	8:00 AM
Queens/ Staten Island	L–Z	Students auditioning for a single studio or Technical Theater	Sunday, November 18, 2018	11:30 AM

AUDITION EXCEPTIONS

If a student's audition date conflicts with a religious observance, the student may audition on either the Saturday or Sunday of the student's scheduled weekend.

If a student's scheduled SHSAT date/time conflicts with their scheduled LaGuardia High School audition, the student must audition on either the Saturday or Sunday of the student's scheduled weekend.

LaGuardia High School requires a doctor's note for students who miss their audition and need to reschedule due to illness/injury.

AUDITIONS FOR STUDENTS NEW TO NEW YORK CITY

A student whose official records indicate that they became a New York City resident after November 1, 2018 may be eligible to audition at the end of summer 2019. Please visit a New York City Department of Education Family Welcome Center once a student becomes a New York City resident.

FIORIELLO H. LAGUARDIA HIGH SCHOOL OF MUSIC & ART AND PERFORMING ARTS AUDITIONS *continued...*

ADMISSIONS PROCESS

■ 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 student must inform their school counselor of their intention to audition and indicate for which studio(s) they wish to audition. The school counselor must provide the student with a receipt to reflect the request during the registration period, and an Audition Ticket prior to the audition date.

■ Successful candidates are expected to exhibit an intermediate to advanced level of proficiency in their art forms. 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. Printed receipts from the registration process are not acceptable. For students who attend a non-public school (private or parochial), one copy of the previous academic year's report card and/or transcript is required for each studio audition for which the student is registered. For example, if the student is auditioning for two studios, then the student must provide two copies of the Audition Ticket and report card. Students are evaluated solely on the official marks awarded during the previous academic school year. No reevaluation will be done based on any subsequent improved academic performance.

REGISTERING FOR LAGUARDIA HIGH SCHOOL AUDITIONS

■ Students interested in applying to one or more of the six studios at LaGuardia High School should review the audition requirements listed in this handbook and also in the *2019 New York City High School Directory* to prepare to audition.

■ Students registered to audition for more than two 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.

■ English Language Learners (ELLs) eligible for testing accommodations and students with Individualized Education Plans (IEPs) or 504 Plans including testing accommodations will receive those accommodations for the LaGuardia High School audition(s) as long as the accommodations do not interfere with the content or the skill being measured.

■ Students with disabilities or eligible ELLs and former ELLs who will be using their accommodations for LaGuardia High School auditions must send relevant documents related to the accommodations to LaGuardia High School prior to the registration deadline (e.g., student's IEP, 504 Plan, or signed letter on school letterhead describing ELL supports received by student in school setting). Documentation for LaGuardia High School can be faxed to 212-724-5748 or emailed to admissions@laguardiahs.org.

■ Students must arrive on time for audition(s), although the arrival time indicated on the Audition Ticket may not be the actual start time of the audition. Students are strongly encouraged to bring a light snack and/or water.

■ 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.

AUDITION INFORMATION FOR EACH STUDIO

A total of 11,881 students registered to audition for one or more of the six studios at LaGuardia High School for the 2018-2019 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 Applicants participate in both a ballet class and a modern dance class. Applicants should wear ballet shoes and fitted black dance attire.

DRAMA Applicants should be prepared to perform two (age and content appropriate) contrasting one-minute monologues. Applicants may be asked to do an impromptu reading. Attire should allow free movement since applicants may be asked to demonstrate how well they move physically.

FINE ART Applicants 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. Students 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, applicants 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 Applicants should prepare a solo selection to perform without accompaniment and bring one copy of the music they plan to perform. Applicants should bring

FIGRELLO H. LAGUARDIA HIGH SCHOOL OF MUSIC & ART AND PERFORMING ARTS AUDITIONS *continued...*

their instruments to the audition, except those auditioning on piano, percussion, tuba, double bass, and harp. These instruments will be provided by the school at the audition. Amplifiers also will be provided at the audition for electric guitarists. Applicants will be tested for rhythm and tonal memory and will be asked to perform a sight-reading excerpt.

TECHNICAL THEATER Applicants 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*. Students must be able to discuss the play and their choices in designing the diorama. Students must also be able to carry the diorama themselves throughout the audition day. Applicants participate in one-on-one, hands-on practical in more than one aspect of technical theater.

VOCAL MUSIC Applicants should prepare a song to sing without accompaniment for the audition. LaGuardia High School has a suggested online song list (www.laguardiahs.org); applicants are not required to select from the song list. In addition to performing the selected song, applicants will be asked to sing back melodic patterns and tap back rhythmic patterns.

1 CONTACT SCHOOL COUNSELOR

Students should contact their school counselor to indicate they would like to take the SHSAT and/or audition for LaGuardia High School within the registration period, starting in early September.

2 OBTAIN A TEST OR AUDITION TICKET

Prior to the testing/audition date(s), school counselors will provide students with a SHSAT Test Ticket and/or a LaGuardia High School Audition Ticket.

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, and testing accommodations (if applicable). Please report conflicts to your child's school counselor as soon as possible. See page 11 for information on make-up requests. Once Test and Audition Tickets have been issued, students are expected to arrive on the date and time indicated on their tickets. SHSAT sites are based on the location of students' current schools, not current home addresses. LaGuardia High School audition dates and times are based on the borough where students currently attend school.

3 REVIEW TEST OR AUDITION TICKET

Students and parents/guardians should review all information on the Test or Audition Ticket for accuracy. ELLs and students with disabilities should check their tickets and make sure they are scheduled for the appropriate testing date (see pages 11 and 14) and with the appropriate accommodations. They should inform their school counselors immediately if there are any errors on the Test or Audition Ticket.

4 COMPLETE AND OBTAIN PARENT/GUARDIAN SIGNATURE ON TEST OR AUDITION TICKET

Students and parents/guardians must sign the Test or Audition Ticket prior to the exam or audition. Those who are taking the SHSAT must list up to eight Specialized High Schools in priority order on the test ticket. Students will copy these choices onto the SHSAT answer sheet on test day. Families and students should work together so that students are prepared to do this correctly. Each student will be considered for admission only for the schools listed on their answer sheet. Students may choose to list only one school on their test tickets and answer sheets, or may list all eight schools on their test tickets and answer sheets in order to increase their chances of receiving an offer to one of the eight Specialized High Schools. This is the only opportunity for students to indicate their choices. The LaGuardia High School

Audition Ticket will show the studio(s) the student is registered to audition for. Students should make a copy of the Audition Ticket for each audition.

5 ATTEND SHSAT OR AUDITION

Students taking the SHSAT must bring their Test Tickets to the test sites on the day of the test.

Students auditioning for any studio at LaGuardia High School must bring their Audition Tickets to their audition(s).

Students arriving without an Audition or Test Ticket 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, another date may need to be scheduled. Students should arrive at the time indicated on the Test or Audition Ticket, but it is important to note that the test or audition may start after the arrival time listed on the Test or Audition Ticket.

Students are allowed to bring cell phones to the SHSAT test site and/or LaGuardia High School, but cell phones must be turned off and not in use while in school buildings. No other electronic devices are allowed. Prior to the start of the audition or SHSAT, students must be prepared to turn in their cell phones when it is requested.

For both the SHSAT and LaGuardia High School auditions, students may bring a snack and water; however, test and audition site staff, including proctors and adjudicators, will determine when consuming these items is allowed.

6 RECEIVE RESULTS

Students must be residents of New York City in order to receive results of the SHSAT and/or offers to LaGuardia High School studio(s). In March 2019, students will be notified through the High School Admissions Round One results letters whether or not they received offer(s) to Specialized High Schools. It is possible for students who audition for one or more of the studios at LaGuardia High School to receive offer(s) to one or more of the studios at LaGuardia High School. Students who receive an offer to a Specialized High School may, at the same time, receive an offer to one of the other high school choices that were submitted on their New York City High School Admissions Round One Application. Students with more than one offer will choose one to accept.

TESTING AND AUDITION ACCOMMODATIONS

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 test accommodations;
- Current ELLs; and
- Former ELLs who achieved proficiency on the New York State English as a Second Language Achievement Test (NYSESLAT) in 2017 and 2018.

The purpose of testing accommodations is to enable 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. Families are encouraged to review the New York City Department of Education's (NYCDOE) resources on testing accommodations for additional information: <http://schools.nyc.gov/Academics/SpecialEducation/FamilyResources/GuidesDocuments/default.htm>.

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 2018-19 504 Plan no later than the last day of school in June 2018. Please see this FAQ on 504 Plans: <http://schools.nyc.gov/Offices/Health/SchoolHealthForms>
- Students who demonstrate disabilities or temporary impairments within 30 days of the SHSAT may receive certain emergency testing accommodations, if approved by the principal. Please see the section on "Emergency Testing and/or Audition Accommodations" on page 20 for more information.

TESTING ACCOMMODATIONS ON THE SHSAT

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 next section). Students and families should contact the school counselor at their current school with questions about testing accommodations on the SHSAT and to make sure their testing accommodations are correct on their test tickets.

Due to the time needed to transition students from the building entrance to the testing rooms, extended time on the examination is calculated from the start time of the exam, not the arrival time indicated on the ticket. In addition, students with extended time may have up to two 15 minute breaks during the extended time period and after the standard administration of 180 minutes. With this in mind, check with the testing site on the day of the test to see when your child is expected to finish the test.

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. Bilingual mathematics 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 mathematics glossaries. Sample glossaries can be found on the NYCDOE Specialized High Schools Admissions Test (SHSAT) website: <http://schools.nyc.gov/accountability/resources/testing/shsat.htm>.

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 the next section).

Students whose IEPs or 504 Plans include 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, must bring these with them on the day of the SHSAT and/or audition if needed. Assistive technology and other aids will not be provided by test or audition sites on testing and/or audition days.

Scribes and Answers Recorded in Any Manner

If a student has a scribe listed on their IEP or 504 Plan, it is important to discuss with the school counselor if the student needs help answering in the test booklet or help filling in the answer sheet. 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

TESTING AND AUDITION ACCOMMODATIONS

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 mathematics tables on the Mathematics 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 mathematics glossaries on the Mathematics 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

In addition, some accommodations that students may use on other tests 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.

TESTING ACCOMMODATIONS FOR LAGUARDIA HIGH SCHOOL AUDITIONS

If there is any question as to whether an accommodation is permitted for an audition, please have your school counselor contact LaGuardia High School directly by phone at 212-496-0700 or email at admissions@laguardiahs.org. For information about arranging for accommodations for LaGuardia High School auditions, please see the next section.

CONFIRMING TESTING ACCOMMODATIONS ON THE SHSAT AND FOR LAGUARDIA HIGH SCHOOL AUDITIONS

■ 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.

■ Both public and non-public students arranging accommodations for LaGuardia High School auditions must have their school counselor send supporting documentation **directly to LaGuardia High School** prior to the registration deadline (e.g., student's IEP, 504 Plan, or signed letter on school letterhead describing English Language Learner supports received by student in school setting). Documentation for LaGuardia High School can be faxed to 212-724-5748 or emailed to admissions@laguardiahs.org. School counselors should contact LaGuardia High School directly with any questions about audition accommodations.

■ 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 20, 2018. 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 20, 2018. 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.

OPTING 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.

TESTING AND AUDITION ACCOMMODATIONS

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.

STUDENTS WITH EXTENDED TIME WHO FINISH THE TEST BEFORE THE END OF THE EXTENDED TIME PERIOD

- All students must stay in testing rooms for the entire standard test administration time (180 minutes), with the exception of bathroom breaks.
- 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 who continue testing into their extended time may have up to two 15 minute breaks during that time.
- 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.

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.

BUILDING ACCESSIBILITY

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>.

The SHSAT assesses knowledge and skills students have gained over the course of their education. These skills consist of the ability to comprehend English literary and informational texts, to demonstrate understanding of revising and editing skills that are important for writing in English, and to use problem-solving skills in mathematics.

SHSAT TEST DESIGN FOR 2018

The SHSAT has two sections: English Language Arts (ELA) and Mathematics. 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.

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

Reading Comprehension Section	
Number of Questions	46-48
Skills Assessed	ability to understand, analyze, and interpret texts
Section Format	6 texts, followed by 6-10 questions

MATHEMATICS SECTION (57 QUESTIONS)

The Mathematics section consists of word and computational questions in either a multiple-choice or grid-in format. There are 5 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.

Students may choose to complete either the English Language Arts or Mathematics section first. Students who finish early may go back to questions in either section to review their work.

Students will not be given extra time at the end of testing to transfer responses from the test booklet to the answer sheet. All responses must be recorded on the answer sheet before the end of the test.

CHANGES TO SHSAT TEST DESIGN

Section	2017 SHSAT	2018 SHSAT
Revising/Editing	20 questions	9-11 questions
Reading Comprehension	5-6 informational texts	3-4 informational texts, 1-2 literary prose texts, 1 poem

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

TEST MATERIALS

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 (a ballpoint pen or other ink cannot be used for machine scoring)
- an eraser
- Assistive Technology (if indicated on the IEP and Test Ticket)

The test site will provide:

- a test booklet with an answer sheet and scrap paper attached

Scrap paper may be used to take notes or for math calculations and will be collected at the end of the test.

SHSAT TESTING PROCEDURES

Students, it is important to review the instructions below with your parent/guardian to ensure understanding prior to testing.

ARRIVING AT THE TEST SITE

- It is important to arrive at the test site at the time indicated on your SHSAT Test Ticket. The test site can provide information about estimated times when students will be released from testing.
- **Please note the test will not begin immediately after the stated arrival time.** The time shown on the Test Ticket is the arrival time, not the time the test will start.
- Prior to the test, you will be asked to read and sign a statement on your answer sheet indicating that you are a resident of New York City, are well enough to take the test, and are taking it at the appropriate grade level. Students who sign this statement but do not meet the requirements specified will be disqualified from acceptance to any of the Specialized High Schools.
- 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.
- If you do not feel well and do not have an approved medical 504, you should inform the test proctor immediately; you should not begin the test or sign the statement. Once you have begun the test, you may not be able to request a make-up test due to illness. Any requests for a make-up test made after you have started the test may not be honored.

Do NOT bring cameras or personal electronic devices such as a calculator, calculator watch, smart watch, MP3 Player/iPod, tablet/iPad, or ebook reader to the test.

Non-calculator, silent watches ARE allowed.

As per NYCDOE testing policy, cell phones and other electronic devices will be collected from all students entering the testing room and returned to the student after the student finishes the test and leaves the testing room. Students may not access any devices during testing, including break periods.

Test sites will designate a cell phone collection procedure for students to follow before the test starts. Students will be instructed to store cell phones/cameras/electronic devices in their backpack/bag, or a school provided container, and place it in the front of the classroom until the conclusion of the test administration. Students are not allowed to bring calculators to the test site. Students who do bring calculators must store them in their backpack/bag, or a school provided container, until the conclusion of the test administration. Any student who refuses to relinquish a prohibited device will not be allowed to take the test. Possession of a prohibited device, including a calculator, 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.

SNACKS, FOOD, AND DRINKS

Students can bring a quiet, unwrapped snack and water, but soda is not allowed.

Students can have their snack before the beginning of test administration. Snacks are not allowed during testing time.

Students who have extended time will have designated snack breaks with snacks provided by the testing site.

FILLING IN THE ANSWER SHEET

Answer sheets will be attached to test booklets. When the proctor instructs you to do so, you must detach the answer sheet and a sheet of scrap paper from the test booklet along the perforations, being careful not to tear the answer sheet or break the seal on the test booklet.

Before taking the test, you will need 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 in your school record and on your high school application. You should not use a 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 child's test score, the order of their school choices, and the number of offers available at each school. If you mark Grid 5 incorrectly, your admission to a Specialized High School may be affected. Therefore, 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, 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 counted.

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. You must fill in a first choice school, and you may fill in only one school for each choice. You must fill in only one circle in a row and only one circle in a column. You must not fill in a school more than once. You must not fill in the same school for each choice.

EXAMPLES OF CORRECT 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 checked="" 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 checked="" type="radio"/>	<input type="radio"/>
Brooklyn 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"/>
HS Math, Sci., & Engineering	<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"/>
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 checked="" type="radio"/>	<input type="radio"/>	<input 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"/>						

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 type="radio"/>	<input checked="" 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 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 checked="" 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.

SHSAT DESCRIPTION AND MATERIALS *continued...*

In Grid 7, you must print the name of the school where you are now enrolled. You will then print your school code exactly as it appears on your Test Ticket available from the test proctor. After that, you will fill in the circle under the corresponding number or letter for each digit of your school code. Fill in the circle marked with the letter “P” if you attend a private or parochial school. For example, a student who attends Abraham Lincoln IS 171 in Brooklyn should complete Grid 7 as shown in the example on the right.

Grid 8 is labeled “STUDENT ID NUMBER.” Write your nine-digit student ID number in Grid 8. You will find this number on your SHSAT Test Ticket. Below each box, fill in the circle containing the same numeral as the box. (See the example on the right.)

When you are told to begin the test, mark your answers on the answer sheet by completely filling in the appropriate circle (see example). 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. Do not fold or tear the answer sheet. 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
(A)	(B)	(C)	(D)	WRONG
(A)	(B)	(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 mathematics 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.

GRID 7									
7. SCHOOL WHERE YOU ARE NOW ENROLLED									
Abraham Lincoln IS 171									
NAME OF SCHOOL									
School Code									
1	9	K	1	7	1				
0	0	●	0	0	0				
●	1	(M)	●	1	●				
2	2	(Q)	2	2	2				
3	3	(X)	3	3	3				
4	4	(R)	4	4	4				
5	5	(W)	5	5	5				
6	6		6	6	6				
7	7		7	●	7				
8	8		8	8	8				
9	●		9	9	9				

P Fill in for private or parochial schools only

GRID 8										
8. STUDENT ID NUMBER										
3	2	1	-	4	5	6	-	7	7	8
0	0	0		0	0	0		0	0	0
1	1	●		1	1	1		1	1	1
2	●	2		2	2	2		2	2	2
●	3	3		3	3	3		3	3	3
4	4	4		●	4	4		4	4	4
5	5	5		5	●	5		5	5	5
6	6	6		6	6	●		6	6	6
7	7	7		7	7	7		●	●	7
8	8	8		8	8	8		8	8	●
9	9	9		9	9	9		9	9	9

STUDENT MISCONDUCT

It is important to note that test security is CRITICAL for the SHSAT. 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, and/or possession of a camera or personal electronic device.

Students found to be engaging in any of these activities will have their tests invalidated and will not be allowed to take the test again until the following school year (for current 8th grade students; 9th grade students will not have any additional opportunities to take the test after 9th grade).

CLAIMS OF TESTING IRREGULARITIES

If you believe there is interference or testing irregularity 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**, 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.

SHSAT SCORING

SHSAT scores are based on the number of correct answers marked on scored questions, which is called a raw score.¹ 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. So, 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. If you are not sure of an answer, you should mark your best guess. Answer each question as best you can or skip it and keep going. If you have time at the end of the test, you should go back.

Each answer sheet is scanned and scored electronically, and the raw score is determined for each test taker. 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. For the SHSAT, two conversions are used to convert the ELA and mathematics raw scores into scaled scores. The first conversion takes into account any small differences between different test forms; this step is called calibration. The second conversion adjusts scores to fit a normal (Gaussian) distribution; this step is called normalization. Both of these conversions 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. After conversion, scaled scores are on a scale that is common to all test forms, making it possible to compare these scores directly.

The conversion from raw score to scaled score is done separately for each section (ELA and mathematics). Then, the scaled scores from each section are added together. The composite score is the sum of the ELA and mathematics scaled scores. The composite score is used to determine admission to a Specialized High School. See page 13 for the description of how admission to a Specialized High School is determined.

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 composite score is usually around 700; however, the actual maximum and minimum scores change from year to year.

¹ A small number of questions will be pre-designated for field testing and will not count towards a student's score.

REVIEW PROCEDURES

After receiving results, students and their parents/guardians may review a copy of their answer sheet by requesting an appointment with a representative from the Office of Assessment. Copies of 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, www.nyc.gov/schools/Accountability/resources/testing/SHSAT,
or
- 2) By sending a written request via certified mail with proof of delivery to:

Office of Assessment, SHSAT Review
131 Livingston Street, Room 401A
Brooklyn, New York 11201

Electronic requests must be submitted and letters must be postmarked no later than March 30, 2019. 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. Along with the student, only a parent/guardian will be admitted to the appointment. Translators are available upon request.

DISCOVERY PROGRAM

As stated in New York State law, the Specialized High Schools may sponsor a Discovery Program to give disadvantaged students of demonstrated high potential an opportunity to attend a Specialized High School program. Students will be notified which schools will be sponsoring a Discovery Program and whether they are eligible to participate in Spring 2019.

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; and
2. have listed one of the Specialized High Schools that plans to host a 2019 Discovery Program as among the choices on their 2018 SHSAT answer sheet; and
3. be certified as disadvantaged by their current school; and
4. 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 been assigned. 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>.

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.

■ **SHSAT School Day Administration Pilot** — In fall 2018, eighth grade students at 50 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 sixth grade students to take the SHSAT in the eighth grade. Eligibility for DREAM-SHSI requires that students meet academic criteria and federal income guidelines. The program runs from February of sixth grade to the fall of eighth grade. Schools will inform students who are eligible to apply in November of their sixth grade year.

■ **DREAM Intensive** — The DREAM Summer/Fall Intensive (Intensive) prepares eligible rising eighth grade 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 seventh grade year through the fall of their eighth grade year, up to the date of the SHSAT. Schools will inform students eligible to apply in late winter / early spring of their seventh grade year.

For more information on the diversity initiatives, please visit:

schools.nyc.gov/SHS

schools.nyc.gov/Offices/SHSI

PARENTS/GUARDIANS ARE ENCOURAGED TO REVIEW THE FOLLOWING TIPS WITH THEIR CHILDREN SO THAT THEY ARE WELL PREPARED FOR THE TEST.

BEFORE TEST DAY

Knowing what to expect on the test and having some practice in test taking is beneficial. This handbook describes each part of the test and contains two sample tests, specific sample Grade 9 questions, and extra samples of the Math grid-in questions to use as practice. Each sample test has been updated to represent the 2018 tests. A list of correct answers is provided for each test, along with explanations.

Become familiar with the directions. Read the directions thoroughly so that you become familiar with them before taking the test, because the directions in the sample tests are the same as the directions on test day. Be sure you understand the task being asked of you. If, prior to test day, you've thoroughly reviewed the directions in the handbook, you should only need to skim them during the actual test.

Simulating the actual testing situation helps. You will have three hours (180 minutes) to complete the test. If you have an approved accommodation (see page 18) or are an ELL, you will have 360 minutes to complete the test. **During the test, how you divide up the time between the ELA and mathematics sections is up to you.** You may start with either section. Use the practice tests to decide how much time you will spend on each section to keep yourself on pace and manage your time on test day. For example, will you spend 90 minutes on each section, or will you spend more time on one section than another? Will you leave certain questions for the end? You may return to one section if you have time remaining after finishing the other section.

Mark your answers on the answer sheet provided in this handbook. Two detachable sample SHSAT answer sheets are provided in the back of this handbook (pages 197 and 199). Use one for Sample Test A and the other for Sample Test B. Remember, on the actual test, you will not be given extra time to mark your answers on the answer sheet after time is up.

After you complete the first 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. Did you read too quickly and misunderstand the question? Did you make careless errors in computation? Did you choose answers that were close to the correct answer, but were not the best answers? Were many of your wrong answers a result of guessing? Did you leave any answers blank? You also should check to see whether there is a pattern to your errors. For example, did you get all of the

inequality questions wrong? Seek out opportunities to do more practice in areas that challenged you.

Put this handbook away for a few days, and then take the second sample test, following the same procedure. Be aware that how well you do on these sample tests is not a predictor of your score on the actual test. However, these tests will give you an idea of what to expect when taking the SHSAT.

On the night before the test, remember to get a good night's sleep.

DAY OF THE TEST

Prepare yourself. Bring your signed Test Ticket with you to your assigned test site and make sure it includes a parent/guardian signature and your ranked choices of Specialized High Schools. Arrive at your assigned test site on time. Wear comfortable clothes and bring a non-calculator watch to keep track of the time. Make sure that you have several sharpened Number 2 pencils and an eraser that erases cleanly. You may also bring a highlighter, pencil grip, or a magnifying glass, if needed.

Do not bring personal electronic devices to the test. Such devices include, but are not limited to: an iPod, calculator, tablet/iPad, or ebook reader. You may bring a cell phone but it must be turned off and collected by your proctor for the duration of the test.

Plan your time. The SHSAT contains 114 items in total, and you have 180 minutes to complete the test. Work carefully, but keep moving at a comfortable pace and keep track of the time. Do not spend too much time on any one question since every question is worth the same. Listen carefully to your test proctor and all instructions regarding time.

Be sure to place all answers on the answer sheet. You will not be given additional time to transfer your answers from the test booklet or any scrap paper to the answer sheet after time is up.

Mark your answers carefully. This is a machine-scored test, and you will not receive credit if you mark the wrong answer. If two bubbles are filled in for a question, that question will be scored as incorrect. Make sure the number you bubble on the answer sheet matches the number of the question you are working on in your test booklet. To change an answer, erase the original mark completely. Avoid making stray pencil marks on your answer sheet.

Use your test booklet or scrap paper to work through each question, as needed. You may write in your test booklet or on scrap paper to work through ELA or mathematics questions, but remember that only answers recorded on the answer sheet will be counted.

USEFUL TIPS **SHSAT TESTING** *continued...*

There is no penalty for a wrong answer. 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. Fill in any blanks when the time limit is almost up.

Make an educated guess when you do not know the answer to a question. Do this by eliminating the answer choice(s) that are definitely wrong, and then choose one of the remaining answers.

Be considerate of other students during the test. Do not chew gum or make noises or movements that would be distracting to others.

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. Students must remain in the testing room for the entire duration of the test (180 minutes).

The English Language Arts section consists of 57 multiple choice questions. There is a Revising/Editing section and a Reading Comprehension section. These questions are aligned to the **Common Core Learning Standards**. The pages that follow provide tips for completing each of the sections.

REVISING/EDITING Part A

The first part of the Revising/Editing section assesses your ability to identify specific errors in language conventions, to select the correction for an error in language conventions, or to improve the quality of the writing presented in sentences or short paragraphs. 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 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:

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

TIPS FOR REVISING/EDITING PART A

READ THE QUESTION FIRST, so you know what type of analysis to do.

READ THE TEXT IN THE BOX and take note of any issues. Consider the following:

- 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?

THINK about possible ways to correct or improve the text before reading the answer options.

Time permitting, it is highly recommended that you re-read the text in the box and the question at least once after you read the answer options.

The following sample questions show different types of items you may encounter in Part A of the Revising/Editing section.

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

Correct Answer: B

Sentence 2 begins with the phrase "As one of the many museums and landmarks of the Smithsonian Institution." The phrase 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, "Millions of people from around the world visit NASM, one of the many museums and landmarks of the Smithsonian Institution, each year." In this revised version, the modifying phrase immediately follows "NASM."

Select the best correction/s for an error/s

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?

- A. Sentence 1: Change *its* to **their**, AND change *is* to **was**.
- B. Sentence 2: Change *visited* to **visit**, AND change *they are* to **it is**.
- C. Sentence 3: Change *becomes* to **became**, AND change *it* to **them**.
- D. Sentence 4: Change *have been* to **had been**, AND change *their* to **its**.

Correct Answer: B

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 B is correct because the revisions in the option correct these errors.

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.

Correct Answer: 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 to/from where monarch butterflies migrate.

REVISING/EDITING Part B

The second part in the Revising/Editing section assesses your ability to read a passage and then make decisions that improve the overall quality of the writing. There is one passage in Part B, and it will be either argumentative or informative. An argumentative passage presents an argument for a claim by offering supporting evidence. An informative passage introduces a topic and explains the topic by offering supporting details. Subjects include historical and current events, people, places, technology, and phenomena in the biological sciences, physical sciences, and social sciences.

Passages may contain errors in language usage, missing or extraneous supporting details, missing or inappropriate transitions, a missing or an unclear introductory statement or concluding statement, and other errors that are typical in student writing. Each sentence is numbered so that you can quickly locate and refer to specific parts of the passage.

TIPS FOR REVISING/EDITING PART B

READ THE PASSAGE CAREFULLY rather than skimming it. Make sure that you understand the content of the text so that you can answer questions about how the text is developed and organized.

As you read, be aware of specific sentences and paragraphs that seem illogical, extraneous, redundant, imprecise, informal, or difficult to read. There are most likely questions that ask you to correct or improve those sentences or the organization of ideas in those paragraphs.

WHEN YOU FINISH READING THE PASSAGE, read each question carefully. Refer back to the passage and re-read the relevant sentences or paragraphs as you work through each question. Keep in mind that it is usually important to read the sentences that appear both before and after the sentence or paragraph stated in the question.

While considering the issues you have noted in the relevant sentences or paragraphs, read each answer option and choose the best one.

The following sample passage and questions show the types of items you may encounter in Part B of the Revising/Editing section.

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.

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 work with diverse colleagues and customers from around the world.
- D. Students who are familiar with world religions may be more aware of how to do business with acquaintances from other countries.

QUESTION 1

(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.

QUESTION 2

(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.

QUESTION 3

(C) Sentence 11 uses vague and imprecise language and needs to be corrected. Of all the available options, Option C uses the most precise language ("understand," "better equipped," "diverse colleagues and customers").

READING COMPREHENSION

This section assesses your ability to read and comprehend five to six texts of both literary and informational genres.

Reading texts in either genre may include any of the text types that middle school students should have experience with.

Informational genre may include	Literary genre may include
exposition	poetry
argument	adventure stories
fictional 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 rather than skimming it, in order to ensure that you thoroughly understand the text. This will help prevent you from making inaccurate assumptions based on only a few details.

TAKE NOTES while actively reading the text in its entirety.

READ THE QUESTION CAREFULLY. If time permits, re-read the relevant part or parts of the text.

TRY TO DETERMINE THE ANSWER BEFORE reading the answer choices. Then read each answer option and choose the best one.

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.

The following sample text and questions show the types of items you may encounter in the Reading Comprehension section.

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 principal 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.

QUESTION 1

(C) Paragraph 3 describes a technique for separating a food into its basic chemical components. Option C best summarizes the goal of this research. Option A and Option D are not supported by the passage as goals of the research. Option B is incorrect because the goal of the research is to capture and reproduce the flavor, not to develop food.

QUESTION 2

(F) The process of collecting aromas during food preparation is described in paragraph 3. Option F is the best answer: the aroma of food as it is being prepared can be captured and distilled to synthesize the food’s flavor (paragraph 3). Option E is not supported because the process of capturing aromas has been successful and only certain flavors present difficulties. The idea that most people cannot tell the difference between natural and synthetic flavors (Option G) is not a conclusion that can be made from the collection of aromas

during food preparation. Option H is incorrect because aromas are collected during the cooking process to isolate essential chemicals that make up flavor (paragraph 3), not to enhance the natural flavor.

QUESTION 3

(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). The idea that consumer preferences for artificial or natural flavors vary could be true, but this is not suggested by the author's discussion of one flavor (orange soda), ruling out Option A. Option B is incorrect because even though the passage states that natural flavors may be more expensive than artificial flavors, the author does not use the details about orange soda to make this point. The author states that some natural flavors may become scarce in the future (paragraph 4), but this is not exemplified by the discussion of orange soda in paragraph 4, ruling out Option D.

QUESTION 4

(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. This is best stated in Option H. Option E may seem like an attractive option because the list of everyday items with synthetic flavors could give the impression that creating synthetic flavors is easy; however, while some synthetic flavors have been successfully created (paragraph 2), efforts to duplicate other flavors have been unsuccessful (paragraph 5), ruling out Option E. The idea that the same synthetic flavor is used in many items (Option F) and the idea that synthetic flavors are healthier than natural flavors (Option G) cannot be concluded from the list of common products that use synthetic flavors (paragraph 2).

USEFUL TIPS MATHEMATICS

The Mathematics section consists of word problems and computational questions in either a multiple-choice or grid-in format. There are 5 grid-in questions and 52 multiple-choice questions. The mathematical terms and general concepts in these test questions can be found in the **Common Core Learning Standards for Mathematics**. The math questions involve application of topics covered in the Common Core. 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 contains many questions that require using mathematical skills to respond to novel situations.

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

TIPS FOR TAKING THE MATHEMATICS SECTION

To improve your mathematics skills, choose a mathematics textbook or ask your teacher for recommendations of websites appropriate for your grade level. Practice solving five to ten questions every day. Do both routine and challenging questions. Routine questions reinforce basic mathematical skills. More challenging questions help you understand mathematical concepts better. Do not limit yourself only to types of questions that test what you have learned in your mathematics class. Do not give up if you cannot complete some of the questions. Skip them and move on. You may be able to solve them after you have practiced different types of questions.

You must know the meanings of **mathematical terms** that are appropriate to your grade level, such as “parallel” and “perpendicular,” as well as the customary symbols that represent those terms. You also need to know **various formulas** learned in your mathematics class, such as those for the perimeter and area of different figures. You can find these mathematical terms, symbols, and formulas in your mathematics course materials. These terms, symbols, and formulas will **NOT** be given in the test booklet. Practice using them to solve questions until you are comfortable with them. Do not use a calculator when solving questions. **Calculators are not allowed on the test.**

READ EACH QUESTION CAREFULLY and work out the answer on scrap paper or in your test booklet. **Do not write on your answer sheet except to fill in your answer.**

YOU MAY DRAW FIGURES OR DIAGRAMS for questions that do not have them. This will help you visualize the context of the question.

SOME QUESTIONS ASK YOU to combine a series of simple steps. Take one step at a time, using what you know about mathematics and what the question is asking or telling you to do.

TIPS FOR MULTIPLE-CHOICE QUESTIONS

MOST MULTIPLE-CHOICE QUESTIONS SHOULD BE DONE by working out the answer. This is more efficient than trying out the options to see which one fits the question. The only exception is when you are explicitly asked to look at the options, as in, “Which of the following is an odd number?”

IF THE QUESTION IS A WORD PROBLEM, it is often helpful to express it as an equation or expression. When you obtain 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, write your answer in a different form. For example, $10(x + 2)$ is equivalent to $10x + 20$. Or reduce (simplify) the fraction to lowest terms, if your answer is in fraction form.

THE INCORRECT CHOICES are answers that students often get if they misread the question or make common computational errors. For this reason, it is unwise to solve a question in your head while looking at the possible choices. It is too easy to be attracted to a wrong choice.

TIPS FOR GRID-IN QUESTIONS

The Mathematics section includes five grid-in questions in which students must solve computational questions and provide the correct numerical answer rather than selecting the answer from multiple-choice options. For each grid-in question, you will write your answer in the boxes at the top of the grid **and** fill in the circles within the grid that match the numbers or symbols that you wrote.

The grid for each question is made up of five columns. When you record your answer in the grid, begin on the left.

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 shows the acceptable way to grid an answer of 5.

Example B shows the acceptable way to grid an answer of 3.2.

EXAMPLE A

EXAMPLE B

	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
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

	3	.	2	
-	.	●	.	.
0	0	0	0	0
1	1	1	1	1
2	2	●	2	2
●	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

The first column on the left of the grid is **ONLY** for recording a negative sign, as in **Example C**. If your answer is positive, leave the first column blank and begin recording your answer in the second column. Example C shows the acceptable way to grid an answer of -1.5 .

EXAMPLE C

-	1	.	5	
●	.	●	.	.
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
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

USEFUL TIPS **MATHEMATICS** *continued...*

When your answer includes a decimal, make sure to fill in the circles that match all parts of your answer. For example, if your answer is 0.78, fill in the circles under the 0, “.”, 7, and 8, like in **Example D**. Note that an answer displaying .78 will also be accepted as correct, like in **Example E**.

EXAMPLE D

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

EXAMPLE E

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

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

	3	0	8	
-
	0	●	0	0
	1	1	1	1
	2	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
	9	9	9	9

EXAMPLE G

	3		8	
-
	0	0	0	0
	1	1	1	1
	2	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
	9	9	9	9

USEFUL TIPS **MATHEMATICS** *continued...*

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

	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

For your answer to be scored, the circles in the grid that match your answer 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.

SAMPLE TESTS AND PRACTICE QUESTIONS

The sample tests in this handbook are Grade 8 forms.

If you are taking the Grade 9 test, work the math questions on pages 184-186 as well as the sample tests for Grade 8. These questions cover topics that are introduced in the Grade 8 curriculum.

Additional grid-in questions are found on pages 189-191.

Two detachable sample SHSAT answer sheets are provided in the back of this handbook. Use one to mark your answers for Sample Test A, and use the other to mark your answers for Sample Test B.

Now you are ready to try sample test Form A. Begin by carefully reading the Directions on pages 44 and 45 and filling out side 1 of the answer sheet (page 197). To fill in your answers for Form A, use side 2 of the answer sheet. When you are ready for Form B, use the second detachable answer sheet (page 199).

NEW YORK CITY PUBLIC SCHOOLS

2018 Specialized High Schools

ADMISSIONS TEST

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, 2004, would be 3-1-04.

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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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 before marking the best answer for each question.

1. Read this sentence.

During a nightly news segment about a cooking contest, a reporter talked to some people who did the best in the contest.

Which revision uses the most precise language for the words *talked to some people who did the best in the contest*?

- A. conversed with some of the people who won the contest
- B. spoke to the three contestants who did well
- C. discussed the contest with some of the winners
- D. interviewed the top three contestants

2. Read this paragraph.

(1) When coal was used to heat homes, it frequently left soot stains on the walls. (2) Brothers Cleo and Noah McVicker, who owned a cleaning product company created a doughy substance to help people remove this soot. (3) Over time, as natural gas becomes more common, people had little need for soot cleansers, and the McVickers' family company struggled to stay in business. (4) Then one day Joe McVicker, Cleo's son, learned that his sister-in-law had been using the substance for art projects in her classroom, so he remarketed the product as the toy known today as Play-Doh.

Which pair of revisions need to be made in the paragraph?

- E. Sentence 1: Delete the comma after *homes*.
Sentence 3: Change *becomes* to *became*.
- F. Sentence 1: Delete the comma after *homes*.
Sentence 4: Change *remarketed* to **had remarketed**.
- G. Sentence 2: Insert a comma after *company*.
Sentence 3: Change *becomes* to *became*.
- H. Sentence 2: Insert a comma after *company*.
Sentence 4: Change *remarketed* to **had remarketed**.

3. Read this paragraph.

(1) Walking dogs, cleaning kennels, hand-feeding newborn kittens, and supporting the pet-adoption process, the animal shelter is looking for volunteers to help with a variety of tasks. (2) Working at the animal shelter is a great way for young people, especially those who aspire to care for and protect animals, to gain valuable work experience. (3) In addition to hands-on training with animal care, volunteers will learn important job skills, such as punctuality, responsibility, and personal initiative. (4) Caring for animals can also help volunteers develop empathy, which is the awareness and understanding of the feelings of others.

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

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

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 before marking the best answer for each question.

Moving through Mountains

(1) An age-old proverb says that necessity is the mother of invention. (2) Centuries of human ingenuity in the face of obstacles prove this to be true. (3) For many years the Swiss Alps, a mountain range spanning southern Switzerland and northern Italy, were such an obstacle. (4) Roads and railways had to navigate around the mountains or through winding tunnels inside the mountains, making the transportation of people and goods difficult and time consuming. (5) In 2016 these burdens were eased with the completion of the Gotthard Base Tunnel.

(6) Construction of the high-speed railway tunnel began in 1996. (7) The tunnel was created through the use of tunnel-boring machines, which are giant drills with a flat rotating head called a cutter head. (8) Each of the tunnel-boring machines used during the construction of the tunnel was about the length of four football fields arranged end-to-end. (9) During the seventeen-year construction period, 28 million tons of rock were removed, enough to rebuild the Great Pyramid of Giza five times. (10) This massive construction project is reported to have cost \$12 billion. (11) After that, 4 million cubic meters of concrete, or enough concrete to build eighty-four Empire State Buildings, were used to construct and support the tunnel.

(12) By 2020 the high-speed railway will carry more than 250 freight trains and 55 passenger trains a day, with most traveling at speeds of around 100 to 125 miles per hour. (13) It will be faster for people to travel between northern and southern Europe. (14) The travel time between the European cities of Zurich, Switzerland, and Milan, Italy, will be reduced by an hour. (15) Many European leaders compare the Gotthard Base Tunnel to the Channel Tunnel, a 33-mile underwater tunnel that connects the United Kingdom and France. (16) While there is no roadway in the Channel Tunnel, people can drive their cars onto special trains that will carry vehicles through to the other side.

(17) Just as traffic congestion in major cities led to the construction of underground local transportation, natural formations, such as mountain ranges, have also sent people underground for faster, easier, and cheaper methods of transportation across larger areas. (18) There is renewed interest in constructing innovative methods of transportation that will help eliminate problems associated with traveling to and from certain areas.

4. Which sentence should be added after sentence 5 to introduce the main topic of the passage?
- E. The construction of the Gotthard Base Tunnel was approved by Swiss voters in 1992 and was funded by tolls, fuel taxes, and government loans.
 - F. Leaders from several European countries attended the opening ceremonies for the Gotthard Base Tunnel, a Swiss tunnel.
 - G. The Gotthard Base Tunnel is the world’s longest and deepest railway tunnel, stretching 35.5 miles straight through the base of the Swiss Alps.
 - H. The Gotthard Base Tunnel continues to help reduce the number of freight trucks on the roadways in the Swiss Alps.
5. Which sentence should be added to follow and support sentence 7?
- A. The tunnel-boring machine is helpful to tunnel builders in the modern era and has been an improvement over dynamite.
 - B. These enormous tunnel-boring machines function somewhat like a cheese grater, with the cutter head grinding slowly through rock and stone.
 - C. Engineers had considered making a tunnel under the mountains for many years, but it was impossible to do without modern tunnel-boring machines.
 - D. Different types of cutter heads are used with tunnel-boring machines depending on the geology of the area where the tunnel is being created.
6. Where should sentence 11 be moved in order to improve the organization of the second paragraph (sentences 6–11)?
- E. to the beginning of the paragraph (before sentence 6)
 - F. between sentences 6 and 7
 - G. between sentences 8 and 9
 - H. between sentences 9 and 10
7. Which sentence presents information that shifts away from the main topic of the third paragraph (sentences 12–16) and should be removed?
- A. sentence 13
 - B. sentence 14
 - C. sentence 15
 - D. sentence 16

8. Which transition phrase should be added to the beginning of sentence 18?
- E. Although the Gotthard Base Tunnel is mainly for freight trains
 - F. With the Gotthard Base Tunnel taking ten years to complete
 - G. Because of the successful completion of the Gotthard Base Tunnel
 - H. As the number of trains using the Gotthard Base Tunnel increases
9. Which concluding sentence should be added after sentence 18 to support the topic presented in the passage?
- A. There is proof that underground tunnels such as the Gotthard Base Tunnel are beneficial to the economy of the surrounding area.
 - B. The Gotthard Base Tunnel is an extraordinary example of how human ingenuity and persistence can overcome great obstacles.
 - C. The completion of the Gotthard Base Tunnel shows that people can work together to achieve important goals.
 - D. The Swiss government is confident that the economic impact of the Gotthard Base Tunnel will be worth its construction cost.

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 before marking the best answer for each question. Base your answers only on the content within the text.

CONTINUE ON TO THE NEXT PAGE ►

An Early Warning

- 1 One of the books that has done the most to alert the world to the dangers of environmental degradation is George Perkins Marsh's *Man and Nature*. Its message—that Western society is in the process of causing irreparable harm to the environment—greatly influenced ecologists during the beginning of the modern environmentalist movement in the 1960s. Marsh was not, however, part of this movement. Surprisingly, *Man and Nature* was first published in 1864.
- 2 Marsh first observed the environmentally destructive effects of human activities while growing up in Vermont in the early nineteenth century. The heavy demand for firewood had depleted the forests, and extensive sheep grazing had stripped the land. The result was flooding and soil erosion. Furthermore, streams were fouled by wastes dumped from numerous mills and dye houses.
- 3 Much later in his life, after careers in law, business, farming, and politics, Marsh served as ambassador to Italy. There he noticed land abuse similar to what he had seen in Vermont. Overgrazing and forest mismanagement had rendered areas that had been productive farmland since the days of the Roman Empire desolate. Marsh attributed this to what he called “man’s ignorant disregard for the laws of nature.”
- 4 In Italy, Marsh began to organize his observations and theories. He wrote in a way intended to educate readers about the impact of industrial and agricultural practices on the environment. In *Man and Nature*, he evaluated the important relationships between animals and plants, discussed forestry practices in great detail, and analyzed the ways natural water supplies are affected by human use.
- 5 *Man and Nature* challenged the popular belief that nature can heal any damage that people inflict upon it. Marsh argued that people may use and enjoy, but not destroy, the riches of the earth.
- 6 Furthermore, he asserted that everything in nature is significant and that even the tiniest organism affects the fragile environmental balance. His belief that drastic alteration of this balance would be dangerous is now accepted as a fundamental principle of modern environmental science.
- 7 Although he pointed out environmental damage caused by irresponsible human activities, Marsh did not oppose every human alteration to the environment. To him, the goal was proper management, not a return to wilderness conditions. People should consider the consequences of their actions, he wrote, and become “co-worker[s] with nature.” Marsh praised the Suez Canal, the human-made waterway between the Mediterranean Sea and the Gulf of Aden, as “the greatest and most truly cosmopolite physical improvement ever undertaken by man.” He believed that the advantages of the canal—improved transportation and commerce—would outweigh any environmental damage. Yet he also warned of possible unintended consequences, such as destructive plants and animals spreading from one body of water to the other.
- 8 Marsh was considered a radical thinker during his lifetime. By the late nineteenth century, however, his writings, along with those of John Muir, Henry David Thoreau, and others, had inspired what became known as the conservation movement. The conservationists of that time sought to educate the public that wilderness areas were worth preserving and were responsible for creating the National Park Service and the National Forest Service.

10. Which statement best describes the central idea of the passage?
- E. Marsh’s experience growing up on a farm allowed him to witness firsthand how human demands on nature can lead to problems, and as an adult he wrote one of the first books about conservation.
 - F. Marsh challenged the notion that nature can repair the damage people cause to it, but he also supported human-made modifications to nature that improve transportation and commerce.
 - G. Marsh’s ideas about the environment were considered radical in his lifetime, but they later gained popularity during the environmental movement in the twentieth century.
 - H. Marsh was a radical thinker who believed that people’s actions could dramatically affect nature, and his writings are considered foundational to the conservation movement.
11. Marsh believed that the people of his time caused harm to the environment because
- A. they assumed that future generations would solve any environmental problems.
 - B. they thought industrial progress was more important than protecting nature.
 - C. they were unwilling to change farming and waste-disposal practices.
 - D. they lacked knowledge of nature and natural processes.
12. What is the most likely reason the author uses the word “surprisingly” in paragraph 1?
- E. to argue that Marsh’s ideas are more applicable in the present than they were during his lifetime
 - F. to show that Marsh introduced ideas a century before they became widely accepted
 - G. to emphasize that Marsh was unaware that his ideas would help begin a conservation movement
 - H. to prove that there would be fewer issues with the environment today if people had accepted Marsh’s ideas earlier
13. Which evidence supports the accuracy of Marsh’s theories about nature?
- A. the details about Marsh’s observations of environmental degradation
 - B. the details about how Marsh’s writing inspired a conservation movement
 - C. the details about how Marsh’s ideas are essential to modern environmental science
 - D. the details about Marsh’s opinions on human alterations to the environment

14. Which detail about Marsh provides support for the author's statement in paragraph 5?
- E. his reputation as a radical thinker
 - F. his contribution to the conservation movement
 - G. his experience working as an ambassador
 - H. his approval of beneficial human-made projects in nature
15. Which of Marsh's ideas most influenced the environmental movement of the 1960s?
- A. Some human alterations to the environment are necessary.
 - B. People lack an understanding of the environment.
 - C. Human activities could damage the environment.
 - D. Environmental degradation has been occurring for many years.

CONTINUE ON TO THE NEXT PAGE ►

Champion of the Channel

- 1 In 1926 an editor at the *London Daily News* predicted that Gertrude Ederle, an American swimmer with eighteen world records and three Olympic medals, would fail in her attempt to swim across the English Channel. He claimed that “even the most uncompromising champion of the rights and capacities of women must admit that in contests of physical skill, speed and endurance they must remain forever the weaker sex.” Yet, at only nineteen years old, Ederle not only became the first woman to accomplish this feat, she also broke the men’s record by two hours. Gertrude Ederle’s triumphant swim across the English Channel was a testimony to her determination, innovative spirit, and passion for swimming.
- 2 Crossing the English Channel is a daunting task for any swimmer. At its narrowest point, the channel measures twenty-one miles across. Its icy waters hover around sixty degrees Fahrenheit, and its unruly tides and currents toss swimmers about like bobbing corks. Stinging jellyfish, seaweed, and floating debris from shipwrecks and lost cargoes present added hazards.
- 3 For decades the channel’s perils have defeated countless swimmers. Ederle, too, failed in her first attempt to cross the channel in 1925. Just six miles short of finishing, she became ill, and her coach had to haul her out of the water. Undeterred, Ederle decided to try again. Ederle knew that if she did not complete the challenge this time, she might never get the opportunity to set this record, because a rival female swimmer was preparing to make her second attempt at the crossing as well.
- 4 To prepare for the marathon swim, Ederle found ways to improve her equipment. She and her sister Meg discovered that melted candle wax perfectly sealed goggle edges, effectively waterproofing Ederle’s goggles against hammering waves. The sisters also designed a two-piece silk swimsuit for Ederle. During her first channel-crossing attempt she had worn a standard one-piece swimsuit that, after the lengthy hours of swimming across the channel, had stretched out, filling with water and creating drag, making an already challenging task almost insurmountable. Unlike the cumbersome typical bathing suit, this silk invention weighed little and allowed for easy movement.
- 5 On August 6, 1926, Ederle waded into the channel near Cape Gris-Nez, France. At first she shivered in the bone-chilling water even though she had covered her body in eight layers of grease for insulation. Her limbs felt stiff. Her strokes were irregular. Driving forward, she fought to clear her mind and find what she called her “sphere,” a place where the sea became her only companion and the shrieks of gulls and the humming of boat engines faded away. Using a new overhand stroke called the American crawl, Ederle eventually settled into a steady pace, briskly breaking through waves.
- 6 Throughout Ederle’s swim, two tugboats accompanied her. One carried newspaper reporters who wired dispatches of her progress to shore. The other, displaying a sign that read “This way, ole kid!” with an arrow pointing forward, transported her coach, family, and friends. Her coach played songs, such as “Yes, We Have No Bananas,” on a phonograph so that Ederle could time her strokes to the rhythm. Using a net, her coach also passed her baby bottles of broth for nourishment.
- 7 For hours Ederle swam, dodging debris with an amused smile. However, as she neared the English shore, a sudden fierce storm erupted. The tides and waves forced Ederle backward, and she fought the stubborn swells for several hours. The salty water caused her tongue to swell and inflamed her ears. Yet Ederle felt indescribably happy as she churned through the sea. Finally, as she neared the English shore, the storm abated, and the tide turned. No longer fighting against her, the sea pushed her toward the shore and victory.

- 8 After fourteen hours and thirty-one minutes, Ederle, on wobbly legs, stepped onto the English shore. The waiting crowd roared, honked their automobile horns, blasted their tugboat whistles, and set off flares that flashed in the sky. Ederle had swum into history.
- 9 When Ederle returned to New York, she received a parade, where thousands of people shouted “Trudy!” Not only were everyday American citizens proud of Ederle, but she also inspired them to be more active. Over the next few years, more than 60,000 people credited her with motivating them to earn their American Red Cross swimming certificates. Gertrude Ederle’s accomplishment proved to the world that with determination and passion, it was possible for a person to achieve his or her goals.

SOLO SWIMS ACROSS THE ENGLISH CHANNEL

Earliest Speed Records		
Year	Swimmer	Time
1875	Matthew Webb (M)	21 hours, 45 minutes
1923	Enrico Tiraboschi (M)	16 hours, 33 minutes
1926	Gertrude Ederle (F)	14 hours, 31 minutes
1926	Arnst Vierkotter (M)	12 hours, 38 minutes
Current Speed Records		
Year	Swimmer	Time
2012	Trent Grimsey (M)	6 hours, 55 minutes
2006	Yvetta Hlavacova (F)	7 hours, 25 minutes

16. Read this sentence from paragraph 1.

In 1926 an editor at the *London Daily News* predicted that Gertrude Ederle, an American swimmer with eighteen world records and three Olympic medals, would fail in her attempt to swim across the English Channel.

What does the editor’s comment reveal about the challenges Ederle faced in attempting her feat?

- E. Regardless of her ability, being an American put Ederle at a serious disadvantage over a Londoner, who would be more familiar with the English Channel.
- F. At the time, Ederle still needed more training in order to succeed in the daunting task of swimming the English Channel.
- G. While Ederle could participate in athletic competition, some people were not comfortable with her attempt to swim the channel because no woman had ever attempted it before.
- H. In spite of her previous achievements, Ederle still experienced social as well as physical obstacles in attempting to swim the channel.

17. Which sentence is the best summary of the steps that Ederle took to prepare for her second attempt to swim across the English Channel?
- A. Working with her sister, Ederle waterproofed her goggles using melted candle wax to seal the edges and designed a two-piece silk bathing suit that was lightweight and would not stretch out during the long swim.
 - B. Ederle covered her body in numerous layers of grease for insulation and focused on finding her “sphere” during her swim.
 - C. Ederle began training with her coach, who played music while she swam to help her time her strokes to the music.
 - D. Ederle focused on developing better equipment than the standard swimsuit that proved cumbersome during her first attempt to cross the channel.
18. Read this sentence from paragraph 3.

Ederle knew that if she did not complete the challenge this time, she might never get the opportunity to set this record, because a rival female swimmer was preparing to make her second attempt at the crossing as well.

How does this sentence fit into the overall structure of the passage?

- E. It emphasizes that Ederle’s attempt to swim across the channel led other female swimmers to attempt the challenge.
 - F. It presents the reason why Ederle prepared to cross the channel again immediately after her initial failure.
 - G. It shows Ederle’s realization that she had to rethink her methods if she wanted to be the first woman to cross the channel.
 - H. It indicates that Ederle had learned from her mistakes and was working to fix them before her next attempt.
19. Which sentence best supports the idea that Ederle succeeded in swimming across the channel because of her innovative approach to the challenge?
- A. “Yet, at only nineteen years old, Ederle not only became the first woman to accomplish this feat, she also broke the men’s record by two hours.” (paragraph 1)
 - B. “At first she shivered in the bone-chilling water even though she had covered her body in eight layers of grease for insulation.” (paragraph 5)
 - C. “Using a new overhand stroke called the American crawl, Ederle eventually settled into a steady pace, briskly breaking through waves.” (paragraph 5)
 - D. “No longer fighting against her, the sea pushed her toward the shore and victory.” (paragraph 7)

20. In paragraph 4, the word “insurmountable” is used to highlight
- E. how the bathing suit made it impossible for Ederle to make it across the channel.
 - F. how Ederle and her sister decided to improve Ederle’s swimming equipment in a creative way.
 - G. that the flaws in Ederle’s bathing suit made a difficult task even more complicated.
 - H. that the swimming equipment Ederle used needed to be custom made for her attempt.
21. Which statement describes how the author’s use of problem-and-solution in paragraph 5 contributes to the development of ideas in the passage?
- A. Detailing the challenges that the cold channel waters presented highlights how effective Ederle’s training was.
 - B. Describing Ederle’s physical difficulties during her swim provides evidence of the team effort required in order to ensure her safety.
 - C. Explaining the difficulties that arose early in the effort helps predict the additional problems that occurred during Ederle’s attempt.
 - D. Illustrating Ederle’s process of blocking out her discomfort shows that swimming the channel was both a mental and a physical challenge.
22. Paragraph 7 contributes to the development of the central idea of the passage by
- E. illustrating that Ederle’s physical strength and mental fortitude allowed her to stay focused on her goal.
 - F. conveying that Ederle pushed herself to the edge of her physical capabilities in order to complete the swim.
 - G. highlighting the impact the severe weather had on Ederle’s emotions during her swim.
 - H. emphasizing the surge of emotions Ederle felt as she came closer to achieving a personal goal.
23. Ederle’s victorious swim across the English Channel influenced American attitudes mainly by
- A. sparking interest in physical activity and in seeking swimming certification.
 - B. encouraging other swimmers to seek out and achieve challenging feats.
 - C. demonstrating that women could achieve and even surpass feats accomplished by men.
 - D. showing that determination and perseverance are necessary to overcome previous failures.

24. Which sentence from the passage best conveys the author’s perspective regarding the impact of Ederle’s accomplishment?
- E. “Gertrude Ederle’s triumphant swim across the English Channel was a testimony to her determination, innovative spirit, and passion for swimming.” (paragraph 1)
 - F. “For hours Ederle swam, dodging debris with an amused smile.” (paragraph 7)
 - G. “Yet Ederle felt indescribably happy as she churned through the sea.” (paragraph 7)
 - H. “Ederle had swum into history.” (paragraph 8)
25. The table contributes to the development of the topic of the passage mainly by
- A. emphasizing that people have continued to swim across the channel and have significantly reduced the speed record.
 - B. suggesting that Ederle inspired women to swim across the channel in an attempt to break the current speed record.
 - C. revealing that Ederle is not the only woman who has set a record time for swimming across the English Channel.
 - D. providing a comparison between channel-swimming records of the early twentieth century and current records.

CONTINUE ON TO THE NEXT PAGE ►

Excerpt from *A Tramp Abroad*

by Mark Twain

- 1 Now and then, while we¹ rested, we watched the laborious ant at his work. I found nothing new in him—certainly nothing to change my opinion of him. It seems to me that in the matter of intellect the ant must be a strangely overrated bird. During many summers now I have watched him, when I ought to have been in better business, and I have not yet come across a living ant that seemed to have any more sense than a dead one. I refer to the ordinary ant, of course; I have had no experience of those wonderful Swiss and African ones which vote, keep drilled armies, . . . and dispute about religion. Those particular ants may be all that the naturalist paints them, but I am persuaded that the average ant is a sham.
- 2 I admit his industry, of course; he is the hardest working creature in the world—when anybody is looking—but his leather-headedness is the point I make against him. He goes out foraging, he makes a capture, and then what does he do? Go home? No; he goes anywhere but home. He doesn't know where home is. His home may be only three feet away; no matter, he can't find it. He makes his capture, as I have said; it is generally something which can be of no sort of use to himself or anybody else; it is usually seven times bigger than it ought to be; he hunts out the awkwardest place to take hold of it; he lifts it bodily up in the air by main force, and starts—not toward home, but in the opposite direction; not calmly and wisely, but with a frantic haste which is wasteful of his strength; he fetches up against a pebble, and, instead of going around it, he climbs over it backwards, dragging his booty after him, tumbles down on the other side, jumps up in a passion, kicks the dust off his clothes, moistens his hands, grabs his property viciously, yanks it this way, then that, shoves it ahead of him a moment, turns tail and lugs it after him another moment, gets madder and madder, then presently hoists it into the air and goes tearing away in an entirely new direction; comes to a weed; it never occurs to him to go around it. No; he must climb it, and he does climb it, dragging his worthless property to the top—which is as bright a thing to do as it would be for me to carry a sack of flour from Heidelberg to Paris by way of Strasburg steeple; when he gets up there he finds that that is not the place; takes a cursory glance at the scenery, and either climbs down again or tumbles down, and starts off once more—as usual, in a new direction. At the end of half an hour he fetches up within six inches of the place he started from, and lays his burden down. Meantime, he has been over all the ground for two yards around, and climbed all the weeds and pebbles he came across. Now he wipes the sweat from his brow, strokes his limbs, and then marches aimlessly off, in as violent a hurry as ever. He traverses a good deal of zig-zag country, and by and by stumbles on his same booty again. He does not remember to have ever seen it before; he looks around to see which is not the way home, grabs his bundle, and starts. He goes through the same adventures he had before; finally stops to rest, and a friend comes along.
- 3 Evidently the friend remarks that a last year's grasshopper leg is a very noble acquisition, and inquires where he got it. Evidently the proprietor does not remember exactly where he did get it, but thinks he got it "around here somewhere." Evidently the friend contracts to help him freight it home. Then, with a judgment peculiarly antic (pun not intentional), they take hold of opposite ends of that grasshopper leg and begin to tug with all their might in opposite directions. Presently they take a rest, and confer together. They decide that something is wrong, they can't make out what. Then they go at it again, just as before. Same result. Mutual recriminations follow. Evidently each accuses the other of

¹**we:** the author and his fictional travel companion

being an obstructionist. They warm up, and the dispute ends in a fight. They lock themselves together and chew each other's jaws for a while; then they roll and tumble on the ground till one loses a horn or a leg and has to haul off for repairs. They make up and go to work again in the same old insane way, but the crippled ant is at a disadvantage; tug as he may, the other one drags off the booty and him at the end of it. Instead of giving up, he hangs on, and gets his shins bruised against every obstruction that comes in the way. By and by, when that grasshopper leg has been dragged all over the same old ground once more, it is finally dumped at about the spot where it originally lay. The two perspiring ants inspect it thoughtfully and decide that dried grasshopper legs are a poor sort of property after all, and then each starts off in a different direction to see if he can't find an old nail or something else that is heavy enough to afford entertainment and at the same time valueless enough to make an ant want to own it. . . .

- 4 Science has recently discovered that the ant does not lay up anything for winter use. . . . He does not work, except when people are looking, and only then when the observer has a green, naturalistic look, and seems to be taking notes. This amounts to deception, and will injure him for the Sunday schools. He has not judgment enough to know what is good to eat from what isn't. This amounts to ignorance, and will impair the world's respect for him. . . . He cannot stroll around a stump and find his way home again. This amounts to idiocy, and once the damaging fact is established, thoughtful people will cease to look up to him. It is strange beyond comprehension that so manifest a humbug as the ant has been able to fool so many nations and keep it up so many ages without being found out.

From A TRAMP ABROAD by Mark Twain—Public Domain

26. The phrase “those wonderful Swiss and African ones which vote, keep drilled armies, . . . and dispute about religion” in paragraph 1 shows that the author
- E. believes that the behavior of the ants is reflected in other living creatures.
 - F. acknowledges that his observations of a few do not necessarily apply to all.
 - G. knows that disproving a commonly held belief is challenging.
 - H. accepts that there are flaws in his interpretation of the behavior of the ants.
27. The central idea that “the average ant is a sham” (paragraph 1) is conveyed mainly through the
- A. comical descriptions of the inability of the ants to accomplish the task at hand.
 - B. comparison between ants from other countries and the ants being observed.
 - C. keen observations that the level of intelligence of ants is mostly overstated.
 - D. conclusion that ants value objects that are of little practical use to them.

28. In paragraph 2, how do the words “grabs,” “yanks,” and “tearing away” contribute to the meaning of the excerpt?
- E. They highlight the ant’s belief that his work is important.
 - F. They illustrate that the ant is more efficient working on his own.
 - G. They indicate the speed with which the ant completes his tasks.
 - H. They emphasize the ant’s anxious efforts to be productive.

29. Read this text from paragraph 2.

He . . . comes to a weed; it never occurs to him to go around it. No; he must climb it, and he does climb it, dragging his worthless property to the top—which is as bright a thing to do as it would be for me to carry a sack of flour from Heidelberg to Paris by way of Strasburg steeple;

These details convey the central idea in the excerpt by showing that the ant

- A. often wastes his strength when working on a task.
 - B. is surprised by the effort he needs in order to move the object.
 - C. is oblivious to the most practical solution to his problem.
 - D. focuses more on obtaining the object than getting it back home efficiently.
30. Which of the following best explains the author’s fascination with the ants?
- E. “During many summers now I have watched him, when I ought to have been in better business, and I have not yet come across a living ant that seemed to have any more sense than a dead one.” (paragraph 1)
 - F. “I admit his industry, of course; he is the hardest working creature in the world—” (paragraph 2)
 - G. “Science has recently discovered that the ant does not lay up anything for winter use.” (paragraph 4)
 - H. “It is strange beyond comprehension that so manifest a humbug as the ant has been able to fool so many nations and keep it up so many ages without being found out.” (paragraph 4)

31. Read this sentence from paragraph 2.

At the end of half an hour he fetches up within six inches of the place he started from, and lays his burden down.

How does the sentence contribute to the development of the central idea of the excerpt?

- A. It reveals that the ant is aware of the purposelessness of his efforts and that he does not enjoy his work.
- B. It highlights how little the ant accomplishes despite the great amount of effort he exerts.
- C. It suggests that the ant has an industrious attitude and does not easily give up.
- D. It emphasizes that the ant does not thoughtfully consider how difficult it would be to carry his capture for such a long period of time.

32. Which sentence from paragraph 2 best supports the idea that sheer “leather-headedness” (paragraph 2) amounts to “ignorance” and “idiocy” (paragraph 4)?

- E. “He goes out foraging, he makes a capture, and then what does he do?”
- F. “He lifts it bodily up in the air by main force,”
- G. “When he gets up there he finds that that is not the place,”
- H. “Now he wipes the sweat from his brow, strokes his limbs, and then marches aimlessly off, in as violent a hurry as ever.”

33. Read this sentence from paragraph 3.

Evidently the friend remarks that a last year’s grasshopper leg is a very noble acquisition, and inquires where he got it.

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

- A. It indicates a shift to the realization that the ants place great importance on an item that has little value.
- B. It emphasizes a shift from an analysis of the actions of the individual ant to a commentary on the actions of the ants working together.
- C. It introduces a transition to the idea that specific observations about one ant allow for generalizations about all ants.
- D. It provides a transition to the observation that the ant’s friend is just as purposeful in his efforts toward a futile ending as the first ant.

34. Read this sentence from paragraph 3.

The two perspiring ants inspect it thoughtfully and decide that dried grasshopper legs are a poor sort of property after all, and then each starts off in a different direction to see if he can't find an old nail or something else that is heavy enough to afford entertainment and at the same time valueless enough to make an ant want to own it.

How does the word choice in the sentence contribute to the overall meaning of the excerpt?

- E. It creates a humorous critique of the ants' intense attitude toward their pointless work.
 - F. It illustrates the ants' confusion over their lack of positive results compared with their level of effort.
 - G. It highlights the ants' frustration as they repeatedly chose a difficult task over one that could be accomplished more easily.
 - H. It illustrates the ants' stubborn determination to hold on to the worthless object.
35. How does the presence of the friend in paragraph 3 influence the first ant's behavior?
- A. The friend distracts the ant from finding the correct path home.
 - B. The friend inspires the ant to consider a new approach to the situation.
 - C. The friend encourages the ant to continue his worthless efforts.
 - D. The friend tries to prevent the ant from finishing his task.

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Ruins of a Fabled City

- 1 The African country of Zimbabwe took its name from the Shona word meaning “stone enclosures” or “venerated houses.” In fact, today dozens of stone ruins are scattered throughout Zimbabwe and other areas in southeastern Africa. One of these ruins, known as Great Zimbabwe, was once a fabled city that inspired tales that circulated throughout Europe. Where was this remarkable city, and who had built it? For centuries the mystery occupied the minds of explorers and treasure seekers.
- 2 The first reports to Europeans of Great Zimbabwe were spread a thousand years ago by Arab traders sailing between the Middle East and the east coast of Africa. The traders told of the fabulous wealth of a mysterious stone city in the African interior. In the trader’s tales, that city became associated with the Europeans’ understanding of Middle Eastern history—the Queen of Sheba, King Solomon and his legendary gold mines, long since lost to the world. By the sixteenth century, Portuguese explorers regularly visited East Africa, searching for King Solomon’s gold, but they never found Great Zimbabwe. In 1552, a Portuguese historian, João de Barros, recorded a story told by Arabs about a city with a “square fortress of masonry within and without, built of stones of marvelous size, and there appears to be no mortar joining them.”
- 3 In fact, Great Zimbabwe *was* a marvel. In one area a massive wall more than thirty feet high and twenty feet thick created a great enclosure. Another area contained a fortress-like series of walls, corridors, and steps built into the bluff that overlooks the ruins. Throughout the city, each stone was precisely fitted to the others without the use of mortar.
- 4 In the 1870s Karl Mauch, a German geologist, was the first European to see Great Zimbabwe, by then in ruins. Mauch realized that he had “rediscovered” the fabled city from de Barros’s story. He jumped to the conclusion that Great Zimbabwe had been built by the Queen of Sheba. British authorities sent a British journalist, Richard Hall, to Great Zimbabwe to investigate Mauch’s report. Archaeology was still in its infancy, and Hall, convinced that the structures had been built by ancient people from the Middle East, dug up and discarded archaeological deposits that would have revealed much about the true history of Great Zimbabwe. Later European excavations destroyed even more valuable evidence.
- 5 In the twentieth century, after excavating areas that had not been disturbed, David Randall-MacIver, a Scottish Egyptologist, and Gertrude Caton-Thompson, an English archaeologist, concluded that the ruins were unmistakably African in origin. Great Zimbabwe was most likely built during the fourteenth or fifteenth century by the ancestors of the present-day Shona people. Recent carbon-14 dating supports their conclusion. Great Zimbabwe was once home to an estimated 20,000 people, the center of a great Shona kingdom. Wealthy Shona kings traded their ivory and gold in coastal towns for other goods, thus accounting for the discovery of beads and other foreign wares in the ruins.
- 6 One mystery of Great Zimbabwe had been solved. Another mystery remains: why was the settlement at Great Zimbabwe abandoned, leaving the magnificent stone architecture to fall into ruins?

36. Which statement best describes the central idea of the passage?
- E. Great Zimbabwe was an enormous stone city thought to be home to some of the greatest treasure of ancient history.
 - F. Mysteries related to Great Zimbabwe continue to interest historians and explorers even though archaeologists have confirmed its origins.
 - G. The history of Great Zimbabwe was subject to much speculation until modern archaeologists definitively determined its origins.
 - H. Early missteps in the study and excavation of the Great Zimbabwe ruins led to the loss of valuable evidence about the city.
37. What was the main way that Karl Mauch’s conclusions about Great Zimbabwe in paragraph 4 affected later archaeological investigations?
- A. Archaeologists from all over Europe became interested in excavating the area.
 - B. Archaeologists made assumptions about the history of the ruins before excavating.
 - C. Archaeologists started to believe that many of the past accounts recorded about the ruins were true.
 - D. Archaeologists realized it was unlikely that an ancient culture could build such grand structures.
38. Which statement best describes Portuguese explorers’ experience searching for Great Zimbabwe?
- E. They routinely visited East Africa but never located the city.
 - F. They were motivated by the hope of finding a mysterious city.
 - G. They used details from de Barros’s story in order to determine the city’s exact location.
 - H. They studied history books in order to gather information about the city.
39. What was “one mystery of Great Zimbabwe” (paragraph 6) that had been solved?
- A. why the settlement was abandoned
 - B. where the ivory and gold from the city went
 - C. why the ruins remained undiscovered until the 1870s
 - D. who had built the settlement

40. Which statement about the Shona people is best supported by the passage?
- E. They live along the east coast of Africa.
 - F. They are descendants of the people who built Great Zimbabwe.
 - G. They lived in the Middle East before settling in Africa.
 - H. They were once ruled by King Solomon and the Queen of Sheba.
41. The conclusions of David Randall-MacIver and Gertrude Caton-Thompson were significant because they
- A. proved that Great Zimbabwe was much older than previously thought.
 - B. questioned why the Shona people left Great Zimbabwe.
 - C. supported the idea that the ancient Shona had a robust society at Great Zimbabwe.
 - D. revealed that Great Zimbabwe was African in origin.

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Cross-Purposes

What I am is *built*: concrete and steel.
I defy gravity. I am what every athlete
wants: to remain at the apex of the leap,
up in the air. And yet I am useful, too:
5 cars, trucks, people, even trains
make their way across my broad back.
Swallows and ospreys¹ nest in my trusses.

*What I am is motion. I am water, and I am older
than anything else you know. No human
10 built me. I am gravity's best friend; I pool
and flow wherever gravity takes me.
I am the blood flowing in the runner's chest,
and I catch everything: from the hills,
the mountains. It all washes down through me.*

15 What you are is an *accident*,
what happens to rain when rain gives in
to Earth's gravitational pull.
You are some tears dribbling from a mountain's
eye, running down the pavements
20 of small towns, into the cities, to the sea.
You are the path of least resistance.

*What I am is power. You, of course,
have none: you are a static lump, an artifact
slowly decaying. But my regal flow
25 nourishes grasses, permits empires to rise.
Those who made you will break you,
in time, replacing you with yet another
clumsy structure. I have seen. I know.*

“Clumsy”? Being rebuilt makes me
30 a friend of time, does it not? And it means
that I have siblings—those “clumsy” structures,
my sisters and brothers.
We stitch across the rip you make.
We are steel thread to the human needle.
35 We bind you up. We sew you.

¹ospreys: large birds

*And I sow into you; in every cranny
of your superstructure my vapors cling.
They bring out your softness, your rust.
Boast your best, and boast better yet.
40 I am listening to the bright hum
of the wind in your wires. Because I am,
above all else, patient. I will wait for you.*

42. How does the similar construction of the sentence in line 1 and the sentence in line 8 contribute to the meaning of the poem?
- E. It introduces the intended permanence of the structure and the ever-changing fluidity of the water.
 - F. It shows that the structure can bridge the gap caused by the water.
 - G. It suggests that the structure has more limitations than the water.
 - H. It contrasts the stability of the structure with the instability of the water.
43. Read lines 2–4 and lines 12–14 from the poem.

**I am what every athlete
wants: to remain at the apex of the leap,
up in the air.**

*I am the blood flowing in the runner's chest,
and I catch everything: from the hills,
the mountains.*

How do the lines contribute to the development of a central idea of the poem?

- A. They establish that both the structure and the water have endurance and control.
 - B. They highlight that both the structure and the water are powerful and impressive.
 - C. They suggest that the structure and the water are unaware of how similar they are.
 - D. They reveal that the structure and the water are surprised that they are interrelated.
44. Read line 7 from the first stanza.

Swallows and ospreys nest in my trusses.

How does the line contribute to the development of ideas in the stanza?

- E. The line supports the structure's claim that it is beneficial to nature.
- F. The line reveals that the structure secretly envies the water's importance in nature.
- G. The line emphasizes that the structure is more valuable to nature than the water is.
- H. The line reveals the kinship that nature shares with the structure.

45. Read lines 18–20 from the poem.

**You are some tears dribbling from a mountain’s
eye, running down the pavements
of small towns, into the cities, to the sea.**

What impact do the phrases “some tears dribbling” and “running down” have on the meaning of the poem?

- A. They suggest that naturally flowing water is a problem in populated areas.
 - B. They highlight the different types of naturally flowing water.
 - C. They imply that the flow of water is weak and influenced by the landscape.
 - D. They highlight that the flow of water from the mountains is minimal compared with that of the seas.
46. The comparison to sewing in lines 33–35 helps show that the structure
- E. enhances the beauty of the natural landscape.
 - F. brings people together more effectively than nature does.
 - G. provides clear boundaries for natural environments.
 - H. serves as a means for people to overcome an obstacle created by nature.
47. The last stanza (lines 36–42) conveys a central idea of the poem by
- A. demonstrating that both the structure and the water depend on each other to fulfill their functions.
 - B. implying that a stronger structure would be able to resist the degradation caused by the water.
 - C. revealing that the passage of time will render both the structure and the water obsolete.
 - D. suggesting that the water will eventually weaken the structure and will continue to exist after the structure is gone.
48. Read lines 41–42 from the poem.

***Because I am,
above all else, patient. I will wait for you.***

Which of the following supports what is implied in these lines?

- E. “*I am older / than anything else you know.*” (lines 8–9)
- F. “*No human / built me.*” (lines 9–10)
- G. “*It all washes down through me.*” (line 14)
- H. “*Those who made you will break you,*” (line 26)

49. How does the poet develop the points of view of the structure and the water?
- A. by relating a discussion between them about the future of human civilization
 - B. by narrating a debate they have over their impact on the environment
 - C. by illustrating the unique power they each possess over nature
 - D. by using personification to allow them to debate who is more important
50. How does the form of the poem contribute to its meaning?
- E. The use of an equal number of lines in each stanza emphasizes that both speakers are equally important.
 - F. The use of italics in some of the stanzas indicates the increasing tension between the structure and the water.
 - G. The alternating positions of the stanzas highlight the opposing points of view of the speakers.
 - H. The lack of a regular rhyme scheme or meter reflects the way the water changes the structure and the way the water itself changes.

The Year without a Summer

- 1 The eruption of the Philippine volcano Mount Pinatubo in June 1991 sent a huge cloud of gas and dust encircling the globe. The dust and ash from Mount Pinatubo was blamed for a two-year decrease in global temperature, changes in weather patterns, and damage to the ozone layer. The situation brings to mind a time now remembered as “The Year without a Summer,” a meteorological event that occurred 175 years earlier. At that time, harsh weather conditions plagued much of eastern North America and, to a lesser extent, northern Europe.
- 2 April 1816 brought typical spring weather to upstate New York and New England; trees budded, and farmers prepared to plow and plant. In May, however, the expected warm temperatures failed to arrive. Most people remained optimistic, waiting for the summer that was “just around the corner.” They waited in vain. During the first week of June, ten inches of snow fell on New England. Throughout the month, temperatures rarely rose above the 30s. Many farmers replanted crops several times, only to see them stunted or destroyed by sleet, hail, and icy winds. July and August brought little improvement. During most days the temperature stayed in the 40s. Farmers’ diaries document the farmers’ daily struggles with near-freezing temperatures, failing crops, and dying farm animals. The few crops that managed to survive were killed by frost in mid-September. Winter came early in New England and was unusually severe. Even the South was affected; on July 4, the high temperature for Savannah, Georgia, was only 46 degrees Fahrenheit!
- 3 Some religious leaders warned their congregations that the unusual weather meant that the end of the world was drawing near. Other leaders attributed the cool weather to unusual sunspot activity. The proliferation of the newly invented lightning rod was also blamed as some people believed that lightning rods had interrupted the natural temperature balance of Earth, causing the cooler temperatures.
- 4 It was not until October that the first plausible explanation for “The Year without a Summer” was suggested. Friedrich Bessel, a German astronomer, reported seeing thick clouds of dust in the upper atmosphere. He theorized that these dust particles screened portions of Earth from the warming rays of the sun. It was discovered that in April 1815, Mount Tambora, an Indonesian volcano, had erupted with such force that it had sent an estimated 100 cubic miles of fine dust into the atmosphere. Witnesses to the eruption reported that the sky remained dark for two days. The dust then rose high into the stratosphere, where it encircled the world for several years to come.
- 5 Skeptics in 1816 doubted that a faraway volcano could steal their summer. However, most present-day researchers believe Bessel’s explanation to be generally correct, demonstrating the global nature of weather. The dust in the atmosphere eventually settled, and the spring of 1817 was back to normal.

51. Which of the following best tells what this passage is about?

- A. the belief of some religious leaders that the end of the world was coming in 1816
- B. a summer of strange weather and its probable cause
- C. the importance of summer weather to agriculture in New England
- D. a comparison of the weather of 1816 and 1991

52. What is the most likely reason farmers persisted in replanting their crops?
- E. They believed that the cold weather could not continue all summer long.
 - F. They thought that crops would be able to survive even though the weather remained cold.
 - G. They believed that the improved weather conditions of July would last.
 - H. They thought the June snowfalls would provide needed moisture.
53. In the winter that followed the summer of 1816, New Englanders most likely experienced
- A. new weather events that they had not encountered before.
 - B. temperatures that were warmer than usual for that time of year.
 - C. shortages of fruits, vegetables, and other essential crops.
 - D. difficulty adjusting to a different timeline for planting crops.
54. How does paragraph 3 contribute to the passage?
- E. It presents the most probable cause of the 1816 weather.
 - F. It shows how nineteenth-century people explained the 1816 weather.
 - G. It presents a theory about the 1816 weather that some skeptics doubted.
 - H. It includes eyewitness reports to describe the source of the 1816 weather.
55. The author includes the details in paragraph 4 about the eruption of Mount Tambora in order to
- A. suggest that the aftermath of the eruption still affects the environment today.
 - B. highlight the severe impact that the eruption had on the atmosphere.
 - C. provide a description of what happens during a volcanic eruption.
 - D. emphasize how differently people perceive natural events in various parts of the world.

- 56.** Which of the following is implied by the phrase “the global nature of weather” (paragraph 5)?
- E.** Understanding weather events around the world is important for making weather predictions.
 - F.** Extreme weather conditions in some parts of the world can have a lasting impact on a geographical area.
 - G.** Natural disasters tend to occur in different parts of the world at the same time.
 - H.** Conditions in one part of the world can affect weather in another part of the world.
- 57.** The cold summer of 1816 was most likely caused by
- A.** unusual sunspot activity.
 - B.** the excessive use of lightning rods.
 - C.** damage to the ozone layer.
 - D.** an increase of dust in the atmosphere.

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PART 2 — MATHEMATICS

57 QUESTIONS

IMPORTANT NOTES

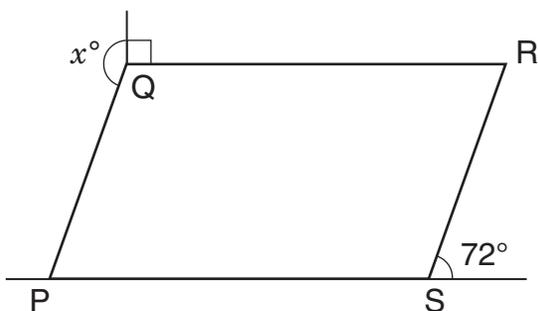
- (1) Formulas and definitions of mathematical terms and symbols are **not** provided.
 - (2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be figured out from the information given.
 - (3) Assume 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, (on a graph) lines that appear to be parallel can be assumed to be parallel; likewise for concurrent lines, straight lines, collinear points, right angles, etc.
 - (5) Reduce (simplify) all fractions to lowest terms.
-

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.



In the figure above, PQRS is a parallelogram. What is the value of x ?

59. The owner of a tree farm plants pine trees and oak trees in a ratio of 8:3. How many oak trees are planted if 264 pine trees are planted?

60. For what value of w is $4w = 2w - 8$?

61. A survey asked students what pets they have. Based on the results, the following statements are all true.

- 20 students have cats.
- 23 students have dogs.
- 3 students have both dogs and cats.
- 5 students have no dogs or cats.

How many students were surveyed?

62. The sum of two consecutive integers 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?

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.** The set of possible values of m is $\{5, 7, 9\}$.
What is the set of possible values of k if
 $2k = m + 3$?

A. $\{3, 4, 5\}$
B. $\{4, 5, 6\}$
C. $\{8, 10, 12\}$
D. $\{10, 14, 18\}$

-
- 64.** $7 + (3n + 6) - (4n + 8) =$

E. $5 - n$
F. $5 + n$
G. $21 - n$
H. $21 + n$

-
- 65.** In a certain school, course grades range from 0 to 100. Adrianna took 4 courses and her mean course grade was 90. Roberto took 5 courses. If both students have the same sum of course grades, what was Roberto's mean?

A. 72
B. 80
C. 90
D. 92

-
- 66.** Jenny starts a game with twice as many marbles as Keiko. Jenny gives Keiko 5 marbles, but she still has 10 more than Keiko. How many marbles did Jenny have to start with?

E. 25
F. 30
G. 35
H. 40

-
- 67.** In a scale diagram, 0.125 inch represents 125 feet. How many inches represent 1 foot?

A. 0.001
B. 0.01
C. 0.1
D. 0.12

68.

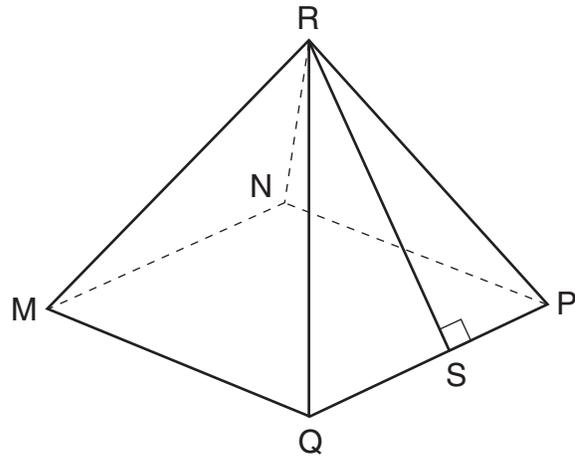
PEOPLE PER VEHICLE AT CHECKPOINT

Number of People in Vehicle	Percent of Vehicles
1	40%
2	35%
3	15%
4	7%
5 or more	3%

A researcher recorded the number of people in each vehicle that passed through a checkpoint. The table above shows the percent distribution for the 420 vehicles that passed through the checkpoint yesterday morning. How many of the 420 vehicles contained **at least** 3 people?

- E. 42
- F. 63
- G. 105
- H. 315

69.



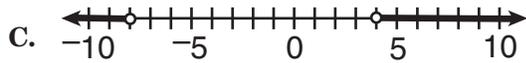
In the pyramid above, each triangular face has the same area, and the base $MNPQ$ is a square that measures 8 centimeters on each side. If the length of $\overline{RS} = 6$ centimeters, what is the surface area of the pyramid **excluding** the base?

- A. 48 sq cm
- B. 96 sq cm
- C. 128 sq cm
- D. 160 sq cm

70. 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

71. Which number line below shows the solution to the inequality $-4 < \frac{x}{2} < 2$?



72. 1 dollar = 7 lorgs
1 dollar = 0.5 dalt

Kevin 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?

- E. \$28
F. \$52
G. \$182
H. \$282

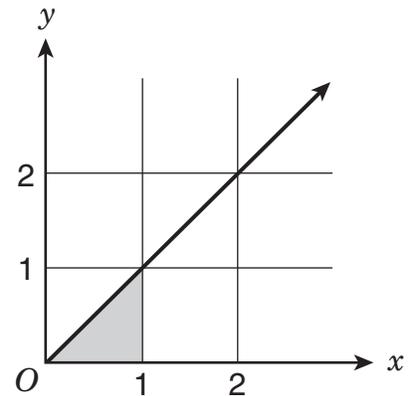
73. A box of colored pencils contains exactly 6 red pencils. The probability of choosing a red pencil from the box is $\frac{2}{7}$. How many of the pencils in the box are **not** red?

- A. 5
B. 15
C. 21
D. 30

74. The sum of the numbers x , y , and z is 50. The ratio of x to y is 1:4, and the ratio of y to z is 4:5. What is the value of y ?

- E. 4
F. 8
G. 10
H. 20

- 75.



What is the area of the shaded region in the graph above?

- A. 0.25 square unit
B. 0.5 square unit
C. 1 square unit
D. 1.5 square units

76. In Centerville, 45% of the population is female, and 60% of the population commutes to work daily. Of the total Centerville population, 21% are females who commute to work daily. What percentage of the total Centerville population are males who do **not** commute to work daily?

- E. 15%
F. 16%
G. 24%
H. 39%

77. Mrs. Cranston bought five bottles of water for \$0.90 each and 8 pounds of meat. She paid a total of \$26.90 for these items, not including tax. What was the price per pound of the meat?

- A. \$2.80
- B. \$3.25
- C. \$14.40
- D. \$22.40

78. In a sample of 10 cards, 4 are red and 6 are blue. If 2 cards are selected at random from the sample, one at a time without replacement, what is the probability that both cards are **not** blue?

- E. $\frac{2}{15}$
- F. $\frac{4}{25}$
- G. $\frac{3}{10}$
- H. $\frac{1}{3}$

79. $1 \text{ sind} = 4 \text{ lorgs}$
 $2 \text{ plunks} = 5 \text{ dalts}$
 $5 \text{ sinds} = 2 \text{ harps}$
 $1 \text{ plunk} = 3 \text{ harps}$

A nation has five types of coins: sinds, dalts, lorgs, harps, and plunks. The relationship between the coins is shown above. Which coin is most valuable?

- A. sind
- B. dalt
- C. harp
- D. plunk

80.

SCORES ON MATH QUIZ

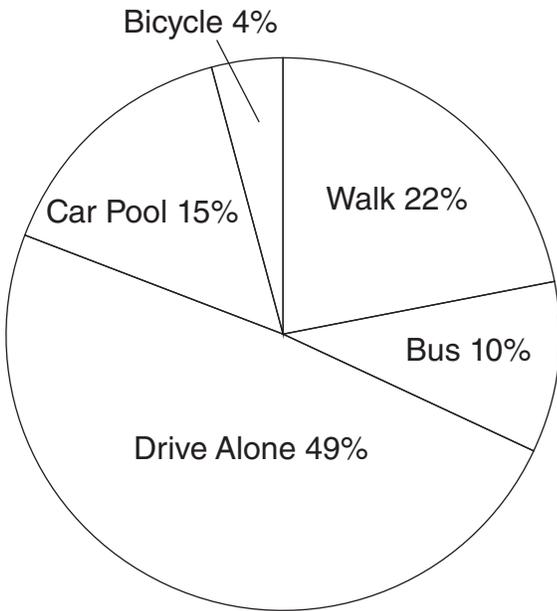
Score	Number of Students
85	4
75	4
65	2

What is the mean score of the 10 students in the table above?

- E. 22.5
- F. 75
- G. 77
- H. 85

81.

HOW PEOPLE GET TO WORK
IN CENTER CITY



Total number of people
working in Center City = 15,000

How many more people in Center City walk to
work than ride their bicycle to work?

- A. 2,500
- B. 2,700
- C. 2,800
- D. 3,000

82. Which of the following numbers has factors
that include the smallest factor (other than 1)
of 91?

- E. 30
- F. 35
- G. 39
- H. 44

83. In a scale drawing of a triangular banner, one
side measures 16 centimeters and the other
two sides each measure 12 centimeters. On
the actual banner, these two sides each
measure 36 feet. What is the length of the
remaining side of the actual banner?

- A. 16 ft
- B. 32 ft
- C. 40 ft
- D. 48 ft

84. The faculty of a certain four-year college
consists of 179 teachers. There are
663 first-year students. The student-to-faculty
ratio for the entire college is 15 to 1. What is
the total number of second-, third-, and
fourth-year students?

- E. 1,989
- F. 2,022
- G. 2,652
- H. 2,685

85.

$$2\frac{1}{5} + 3\frac{3}{10} + 4\frac{2}{5} + 5\frac{1}{2}$$

What is the value of the expression shown
above?

- A. $14\frac{7}{20}$
- B. $14\frac{2}{5}$
- C. $15\frac{7}{20}$
- D. $15\frac{2}{5}$

86. A car is traveling 55 miles per hour, and 1 mile = 5,280 feet. Which of the following calculations would give the car's speed in **feet per second**?

E. $\frac{55 \cdot 5,280}{1}$

F. $\frac{55 \cdot 5,280}{3,600}$

G. $\frac{55 \cdot 3,600}{5,280}$

H. $\frac{55 \cdot 5,280}{60}$

87. Today, Tien's age is $\frac{1}{4}$ of Jordan's age. In 2 years, Tien's age will be $\frac{1}{3}$ of Jordan's age. How old is Jordan today?

- A. 4 years old
- B. 6 years old
- C. 12 years old
- D. 16 years old

88. How many positive even factors of 48 are greater than 24 and less than 48?

- E. 0
- F. 1
- G. 2
- H. 12

89. The least of 5 consecutive integers is l , and the greatest is g . What is the value of $\frac{l+g}{2}$ in terms of l ?

- A. $2l$
- B. $3l$
- C. $l + 2$
- D. $l + 5$

90. Johan leased a car for three years. He paid a one-time fee of \$1,000, and an additional \$300 per month for the full three years. At the end of the three years, what is the total amount Johan paid for leasing this car?

- E. \$1,900
- F. \$4,600
- G. \$10,800
- H. \$11,800

91. There are 6 different cookies on a plate. Aiden will choose 2 of these cookies to pack in his lunch. How many different pairs of 2 cookies can he choose from the 6?

- A. 12
- B. 15
- C. 30
- D. 36

92. For a presentation, Deion can create 5 slides in 20 minutes, working at a constant rate. Kyra can create 3 slides in 10 minutes, working at her own constant rate. What is the total number of slides the two of them can create in one hour?

- E. 16
- F. 30
- G. 33
- H. 55

93.



On the number line above, $LN = \frac{1}{8}$. Point M (not shown) is located between point L and point N. Which value below is a possible value for M?

- A. 4.26
- B. 4.31
- C. 4.35
- D. 4.58

94. An unmarked straight stick will be laid end over end to measure a distance of exactly 72 feet. The same stick will be used in the same way to measure a distance of exactly 30 feet. What is the length of the longest possible stick that can be used for both measurements?

- E. 3 ft
- F. 4 ft
- G. 6 ft
- H. 8 ft

95. Ryan must read 150 pages for school this weekend. It took him 30 minutes to read the first 20 pages. At this rate, how much **additional** time will it take him to finish the reading?

- A. $2\frac{1}{6}$ hr
- B. $3\frac{1}{4}$ hr
- C. $3\frac{3}{4}$ hr
- D. $7\frac{1}{2}$ hr

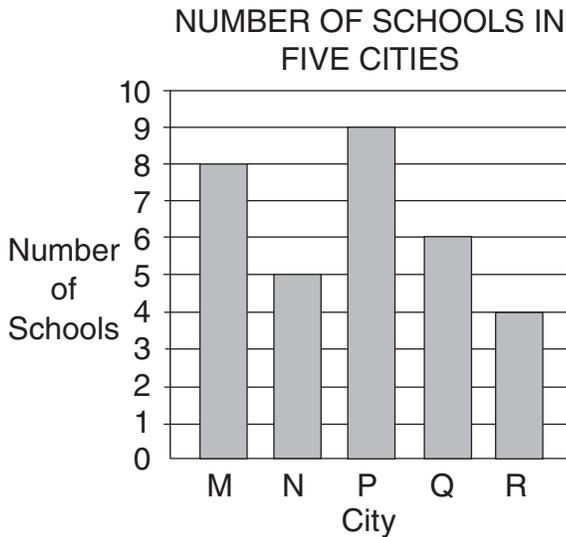
96. Suppose $M = \frac{w}{x}$, $N = \frac{y}{z}$, and $w, x, y,$ and z do not equal 0. What is $\frac{M}{N}$ in terms of $w, x, y,$ and z ?

- E. $\frac{wx}{yz}$
- F. $\frac{wy}{xz}$
- G. $\frac{wz}{xy}$
- H. $\frac{xy}{wz}$

97. In the set of consecutive integers from 12 to 30, inclusive, there are four integers that are multiples of both 2 and 3. How many integers in this set are multiples of **neither** 2 nor 3?

- A. 5
- B. 6
- C. 13
- D. 15

98.



The graph above shows the number of schools per city for five small cities. Cities M and N each have 500 students per school. City P has 400 students per school. Cities Q and R each have 700 students per school. Which of the five cities has the **greatest** number of students?

- E. City M
- F. City P
- G. City Q
- H. City R

99. A box contains 5 strawberry candies, 3 banana candies, and 2 orange candies. If Braden selects 2 candies at random from this box, without replacement, what is the probability that both candies are **not** banana?

- A. $\frac{1}{15}$
- B. $\frac{9}{100}$
- C. $\frac{7}{15}$
- D. $\frac{49}{100}$

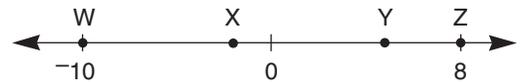
100.

$$\frac{w}{x} = \frac{y}{z}$$

In the equation above, w , x , y , and z are positive numbers. Which of these is equal to z ?

- E. x
- F. xy
- G. $\frac{w}{xy}$
- H. $\frac{xy}{w}$

101.



On the number line above, points W, X, Y, and Z are integers, and $WX:XY:YZ = 4:2:3$. What is the value of \overline{WY} ?

- A. 8
- B. 11
- C. 12
- D. 18

102. A metal square used in an electronic device must have a thickness of 0.02 inch, with an allowable error of 1 percent. What is the **greatest** allowable thickness of the metal square?

- E. 0.0002 in.
- F. 0.02 in.
- G. 0.0202 in.
- H. 0.03 in.

103.

SCORES ON BIOLOGY TEST

Section	Lowest Score	Range
I	65	28
II	62	25
III	67	22

Mr. Blake's biology class is divided into three sections. The same test was given to each section. The table above shows both the lowest score and the range of scores on this test for each section. What is the **overall** range of all scores in all three sections?

- A. 25
- B. 27
- C. 28
- D. 31

104. If $3n$ is a positive even number, how many **odd** numbers are in the range from $3n$ up to and including $3n + 5$?

- E. 2
- F. 3
- G. 4
- H. 5

105.
$$\frac{10}{13} = 0.\overline{769230}$$

In the infinitely repeating decimal above, 7 is the first digit in the repeating pattern. What is the 391st digit?

- A. 0
- B. 3
- C. 6
- D. 7

106. A car travels at 4,400 feet per minute. The radius of each tire on the car is 1 foot. How many revolutions does one of these tires make in 1 minute?

(Use the approximation $\frac{22}{7}$ for π .)

- E. 700
- F. 1,925
- G. 13,828
- H. 15,400

107. $100(2 + 0.1)^2 - 100 =$

- A. 101
- B. 200
- C. 301
- D. 341

108. A sports store has a container of handballs: 4 blue, 5 red, 8 yellow, 9 white, and 11 green. If one ball is picked from the container at random, what is the probability that it will be yellow?

- E. $\frac{1}{37}$
- F. $\frac{1}{8}$
- G. $\frac{8}{37}$
- H. $\frac{8}{29}$

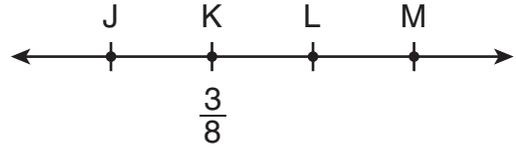
109. Each week, Leon has fixed expenses of \$1,250 at his furniture shop. It costs him \$150 to make a chair in his shop, and he sells each chair for \$275. What is Leon's **profit** if he makes and sells 25 chairs in 1 week?

- A. \$1,875
- B. \$2,500
- C. \$3,125
- D. \$4,375

110. Using the approximation 2.54 centimeters = 1 inch, how many centimeters are in 4 feet 7 inches?

- E. 21.65
- F. 119.38
- G. 121.92
- H. 139.70

111.



On the number line above, $JK = 3\frac{1}{2}$, $JM = 9\frac{3}{4}$, and $LM = 1\frac{1}{8}$. What is the position of point L?

- A. $5\frac{1}{8}$
- B. $5\frac{1}{4}$
- C. $5\frac{1}{2}$
- D. $6\frac{1}{4}$

112. If $4x - 3y = 12$, what is x in terms of y ?

- E. $x = \frac{3}{4}y + 12$
- F. $x = -\frac{3}{4}y + 12$
- G. $x = \frac{3}{4}y + 3$
- H. $x = -\frac{3}{4}y + 3$

113.

SERVINGS OF FRUITS AND VEGETABLES

Number of Servings of Fruits and Vegetables	Number of Students
0	5
1	7
2	3
3	4
4	0
5	1

There are 20 students in a class. The frequency table above shows the number of students in this class who ate 0, 1, 2, 3, 4, or 5 servings of fruits and vegetables yesterday. What is the mean number of servings of fruits and vegetables eaten yesterday per student in this class?

- A. $1\frac{1}{2}$
- B. 3
- C. $3\frac{1}{3}$
- D. 4

114. A paste used to cover a billboard is made by mixing the following ingredients by weight: 4 parts powder, 3 parts water, 2 parts resin, and 1 part hardener. To cover one billboard requires 30 pounds of this paste. How many total pounds of resin are required to cover 4 billboards?

- E. 6
- F. 8
- G. 24
- H. 48

REVISING/EDITING PART A

1. **(D)** The question asks for the most precise revision for the words “talked to some people who did the best in the contest.” Option D is the correct response because the revision precisely states both the reporter’s action (“interviewed”) and whom the reporter interviewed (“the top three contestants”). Option A is an incorrect response because the revision does not provide precise information about the number of people interviewed. Option B is an incorrect response because the revision uses the imprecise phrase “who did well.” Option C is an incorrect response because the revision does not provide precise information about the number of people interviewed.

2. **(G)** The question asks for the pair of revisions needed to correct the errors in the paragraph, which appear in sentence 2 and sentence 3. Option G is correct because it is the only choice that revises the errors in both sentence 2 and sentence 3. In sentence 2 (Option G and Option H), a comma needs to follow the word “company” to set off the phrase “who owned a cleaning product company.” A comma is necessary because the phrase is a nonrestrictive clause: the phrase provides extra information about Cleo and Noah McVicker’s line of work, but the phrase is not necessary in order to understand the meaning of the sentence. The second error is in sentence 3 (Option E and Option G), which incorrectly shifts the verb into the present tense. The clause “as natural gas becomes more common” should be “as natural gas became more common.” The comma after the word “homes” in sentence 1 (Option E and Option F) is necessary for separating the subordinate clause “When coal was used to heat homes” from the main clause. In sentence 4 (Option F and Option H), the word “remarketed” is in the past tense established in the rest of the paragraph and should not change to the past perfect tense “had remarketed.”

3. **(A)** The question asks for the identification of the sentence in the paragraph that has an error in its construction and should be revised. Option A (sentence 1) is the correct response because sentence 1 contains a structural error. The sentence begins with a list of modifying phrases: “Walking dogs, cleaning kennels, hand-feeding newborn kittens, and supporting the pet-adoption process.” As written, this list modifies the closest noun phrase, “the animal shelter,” which is illogical because the list describes tasks at the animal shelter, not the shelter itself. The list should follow the word “tasks” at the end of the sentence, so that it is closer to the word that it modifies. Option B, Option C,

and Option D are incorrect responses because sentence 2, sentence 3, and sentence 4 do not contain structural errors. For Option B, the phrase “especially those who aspire to care for and protect animals” in sentence 2 correctly modifies “young people.” For Option C, the structure of sentence 3 allows the words “In addition to hands-on training with animal care” to correctly modify “volunteers will learn.” For Option D, the phrase “which is the awareness and understanding of the feelings of others” in sentence 4 correctly modifies the word “empathy.”

REVISING/EDITING PART B

Moving through Mountains

4. **(G)** The question asks which sentence should be added to the end of the first paragraph in order to introduce the topic of the passage, which is the description, construction, and use of the Gotthard Base Tunnel. Option G correctly presents and describes the Gotthard Base Tunnel. Option E is incorrect because it offers overly detailed information about the funding used to build the Gotthard Base Tunnel, and it does not provide a description of the tunnel. Option F is incorrect because it gives details about the opening ceremony of the tunnel, and it does not provide a description of the tunnel. Option H is incorrect because it offers a result of completing the Gotthard Base Tunnel, rather than offering an introductory statement presenting and describing the tunnel.

5. **(B)** The question asks for a sentence that provides additional details about the tunnel-boring machines used to build the Gotthard Base Tunnel in order to support the description of the machines in sentence 7. Option B is correct because it offers specific details about how tunnel-boring machines, such as the ones used to create the Gotthard Base Tunnel, drill through rock. Option A is incorrect because it offers information about how tunnel-boring machines were an improvement over previous methods but does not include information about how the machines work. Option C is incorrect because it presents the idea that the tunnel could not be built until advances were made in tunnel-boring machine technology and does not describe how the machines function. Option D is incorrect because, though it explains that there are different types of cutter heads used for different geologies, the geology of the tunnel area is not discussed in sentence 7, nor in the rest of the paragraph.

6. **(H)** The question asks where sentence 11, which completes the detailed steps of how the tunnel was

built, should be moved within the second paragraph in order to improve the organization of the paragraph. Option H, placing the sentence between sentences 9 and 10, is correct because placing the sentence there helps the reader understand the full sequence of steps performed in constructing the tunnel before the cost of the project is introduced. Option E, placing the sentence at the beginning of the paragraph (before sentence 6), is incorrect because it would not make sense since the process of building the tunnel has not yet been introduced. Similarly, Option F is incorrect because placing the sentence after sentence 6 would not make sense given that adding concrete would have to happen after the rock was broken down and removed from the tunnel. Option G, placing the sentence between sentences 8 and 9, would also be incorrect because the use of concrete did not take place before the removal of “28 million tons of rock” (sentence 9).

7. (D) The question asks which sentence should be removed because it presents an idea that shifts away from the main idea of the third paragraph, which is about the transportation benefits of the Gotthard Base Tunnel. Option D (sentence 16) is the correct response because, even though the sentence provides additional information about the Channel Tunnel, it does not help the reader understand the benefits of the Gotthard Base Tunnel, so it should be removed. Option A (sentence 13) is incorrect because the idea of faster travel times is important to the development of the main idea of the paragraph. Option B (sentence 14) is incorrect because the sentence provides a specific example of decreased travel time between two cities when traveling through the Gotthard Base Tunnel, supporting the development of ideas in the paragraph. Option C (sentence 15) is incorrect because the sentence compares the Gotthard Base Tunnel to another tunnel that provides an important connection between places, and the sentence supports the idea that transportation innovations are beneficial.

8. (G) The question asks for a transition that bridges the ideas between sentences 17 and 18 and accurately presents the relationship. Option G is correct because it bridges the sentences by referring to the Gotthard Base Tunnel as a solution to the problems described in sentence 17 and logically introducing sentence 18. Option E is incorrect because the use of the word “although” and the mention of freight trains suggest that sentence 18 will be about other types of vehicles that use the Gotthard Base Tunnel, and the transition phrase does not logically precede the sentence. Option F is incorrect because the reference to the amount of time it took

to build the tunnel does not help lead into the idea presented in sentence 18. Option H is incorrect because it suggests that sentence 18 is related to the increasing number of trains using the Gotthard Base Tunnel, which is not accurate.

9. (B) The question asks for a concluding sentence that supports key ideas about the topic developed earlier in the passage. Option B is correct because it supports the points made in the introductory paragraph by affirming the idea that the Gotthard Base Tunnel is an example of a way people have improved life by overcoming obstacles. Option A is incorrect because the economies of surrounding areas were never mentioned in the passage. Option C is incorrect because, although the construction of the Gotthard Base Tunnel appears to have required many people to work together, the passage does not explicitly mention people or groups working together. Option D is incorrect because it focuses on the cost of the Gotthard Base Tunnel, which is referred to only in sentence 10 of the passage.

READING COMPREHENSION

An Early Warning

10. (H) The question asks for the statement that best illustrates the central idea of the passage. Paragraphs 2 through 5 focus on Marsh’s personal experiences and his ideas about nature, and paragraph 8 explains how his ideas are the basis for the conservation movement. These two aspects comprise the central idea of the passage and are best stated in Option H. Option E is incorrect because it focuses mainly on Marsh’s early life and does not address his influence. Option F is incorrect because, while it describes specific details about Marsh’s beliefs, it does not explain who he was or how he affected the conservation movement. Option G is incorrect because it emphasizes that Marsh’s ideas were radical and influential but does not provide any information about what Marsh’s beliefs were.

11. (D) The question asks for the specific reason Marsh believed people caused harm to the environment. Marsh credited the land abuse he observed in Vermont and Italy to people’s lack of understanding, or ignorance, of nature (paragraph 3) and “the popular belief that nature can heal any damage that people inflict upon it” (paragraph 5). This concept is stated in Option D. Option A is incorrect because, although people are currently working to improve the environment, the passage does not state that Marsh believed that people in his time expected

future generations to solve environmental problems. Option B is incorrect because, while the people of Marsh's time made advances in industry, Marsh did not indicate that he believed that people thought industrial progress outweighed efforts to protect the environment. Option C is incorrect because, while many people at the time participated in "environmental degradation" (paragraph 1), none of the evidence in the passage suggests that Marsh believed that people were unwilling to change their practices.

12. (F) The question asks for the reason the word "surprisingly" was used in paragraph 1. The beginning of paragraph 1 leads the reader to expect that Marsh was part of the modern environmental movement that began in the 1960s. Therefore, the fact that Marsh's influential book was published one hundred years earlier is surprising, and so Option F is correct. Option E is incorrect because, while Marsh's ideas have had a resurgence in popularity since the 1960s (paragraph 1), Marsh's observations about deforestation in Vermont (paragraph 2) and land mismanagement in Italy (paragraph 3) indicate that his ideas were just as applicable in his time as they are today. Option G is incorrect because, while Marsh could not have been aware that his ideas would lead to the start of a conservation movement, paragraph 1 indicates that Marsh introduced the principles of the environmentalist movement before it became popular. Option H is incorrect because, while it is possible that a greater awareness of human impact on the environment during Marsh's time could have prevented certain environmental issues today, this idea is conjecture and does not explain the author's reason for using the word "surprisingly."

13. (C) The question asks for evidence that supports Marsh's theories about nature, based on the passage. The passage states that ideas from Marsh's book are now considered basic knowledge in the field of environmental science (paragraph 6). This statement supports the idea that his theories about nature were accurate, making Option C correct. Option A is incorrect because, while Marsh made observations of the harm that people were causing to the environment (paragraphs 2 and 3), the details about his observations do not provide evidence that his theories were accurate. Option B is incorrect because, while Marsh's writing did inspire a conservation movement (paragraph 8), these details do not call attention to the accuracy of his ideas. Option D is incorrect because it refers to Marsh's personal opinions (paragraph 7), not his theories.

14. (H) The question asks for a specific detail that supports the author's statement in paragraph 5. In paragraph 5, the author states that "Marsh argued that people may use and enjoy, but not destroy, the riches of the earth." Marsh's approval of the Suez Canal shows that Marsh did not oppose certain human innovations, because the advantages—improved transportation and commerce—enriched human life and outweighed environmental damage (paragraph 7). Option H describes that idea. Option E is incorrect because it is not relevant to the statement in question. Option F is incorrect because, while it acknowledges Marsh's contributions to the conservation movement, it does not relate to his attitudes about certain alterations to the environment. Option G is incorrect because it relates to a time when Marsh observed environmental degradation in Italy.

15. (C) The question asks for the idea Marsh had that was the most influential on the movement in the 1960s. Marsh's main contribution to the modern environmental movement—the idea that Western society is causing irreversible harm to the environment—is given in paragraph 1, making Option C correct. Option A is incorrect because, while Marsh did believe that some human alterations to the environment are necessary (paragraph 7), the negative impact of human activity was his most influential idea. Option B is incorrect because, while Marsh believed that people lacked an understanding of nature (paragraph 3), this belief is a detail in support of his overall claim. Option D is incorrect because, while Marsh observed firsthand that environmental degradation had been occurring for many years (paragraph 3), that was not the focus of his most influential idea.

Champion of the Channel

16. (H) The question asks what the sentence reveals about Ederle's challenges leading up to her attempt to swim across the channel. Option H is correct because the sentence implies a lack of social support since many people believed that a woman, no matter how skilled a swimmer, did not have the strength to overcome the physical challenges that the dangerous channel waters presented (paragraph 1: "He claimed that 'even the most uncompromising champion of the rights and capacities of women must admit that in contests of physical skill, speed and endurance they must remain forever the weaker sex.'"). Option E is incorrect because the idea that Ederle was at a disadvantage because she was American rather than English, and thus less familiar with the channel, was not the basis for the newspaper editor's

prediction about the outcome of her swim. Option F is incorrect because the passage establishes that Ederle was a highly accomplished swimmer who had won major world competitions (paragraph 1: “. . . Gertrude Ederle, an American swimmer with eighteen world records and three Olympic medals . . .”). Option G is incorrect; the newspaper editor’s point was that it would be impossible for Ederle to complete the swim because she was a woman, not because people were uncomfortable with the idea since no woman had attempted it before.

17. (A) The question asks for the best summary of Ederle’s steps to prepare for her second attempt to swim across the English Channel. Ederle’s preparation is outlined in paragraph 4. Option A is correct because it acknowledges the idea that Ederle involved her sister in this process, and it details the efforts the two took to improve Ederle’s equipment, including waxing her goggles and designing a better swimsuit. Option B is incorrect because it focuses on Ederle’s actions in the moments before (covering her body with grease for insulation) and during her swim (finding her “sphere”), not her overall preparation methods. Option C is incorrect because it refers to a practice that was employed to help Ederle keep her strokes in rhythm during her swim. Option D is incorrect because it does not refer to the series of steps that Ederle took to prepare for her swim but rather to just one of the efforts made (improving equipment) without acknowledging her sister’s contributions.

18. (G) The question asks how the sentence from paragraph 3 fits into the overall structure of the passage. Option G is correct because it explains that Ederle’s awareness of another female swimmer preparing to make an attempt to swim the channel directly influenced Ederle’s decision to make her second attempt as quickly as possible. Ederle wanted to be the first woman to successfully swim across the channel. Option E is incorrect because the passage does not provide information about other female swimmers who were inspired by Ederle to swim across the channel. Option F is incorrect because, although Ederle did rethink her methods between her first and second attempts, the sentence does not show any sort of realization nor does it address her reasoning for rethinking her methods. Option H is incorrect because the sentence is not related to Ederle’s process for learning from her mistakes.

19. (C) The question asks for the best support for the idea that Ederle’s swim across the channel was successful because of her innovative approach to the

challenge. Option C is correct because the sentence from paragraph 5 explains that Ederle employed a newly developed type of stroke that allowed her to maintain her pace through the rough water. Option A is incorrect because the sentence from paragraph 1 shows that her performance was groundbreaking but not necessarily creative. Option B is incorrect because the layers of grease primarily served to help maintain Ederle’s body temperature in the water, and there is nothing in the passage to suggest that this was an innovative practice. Option D is incorrect because the sentence from paragraph 6 simply states that Ederle fought against the waves and completed her swim, and it does not describe how Ederle employed innovative techniques.

20. (G) The question asks about the effect of the word “insurmountable,” which means “incapable of being overcome,” in paragraph 4. Option G is correct because the suit Ederle wore during her first attempt to swim the channel “stretched out, filling with water and creating drag” (paragraph 4), which likely contributed to her failed attempt to swim across the channel. Option E is incorrect; Ederle did not complete her first swim because she became ill (paragraph 3: “Just six miles short of finishing, she became ill, and her coach had to haul her out of the water.”), not because the suit made it impossible for Ederle to complete her swim. Option F is incorrect because the author uses the word “insurmountable” to draw attention to the increased difficulty caused by the swimsuit, not to draw attention to the sisters’ creativity in solving the problem. Option H is incorrect because the passage does not address whether the original swimsuit was custom made, simply that the swimsuit created additional difficulties for Ederle in a situation that was already difficult.

21. (D) The question asks how a problem-and-solution structure in paragraph 5 contributes to the ideas presented in the passage. Option D is correct because the paragraph describes how the water’s temperature made Ederle uncomfortable and made it difficult for her to regulate her stroke. The paragraph continues with the explanation of how she overcame these issues by focusing her mind on the sea and tuning out the distractions in her surroundings (paragraph 5: “. . . the sea became her only companion and the shrieks of gulls and the humming of boat engines faded away.”). Option A is incorrect because the details in paragraph 5 do not provide a connection between the cold temperature of the water and the effectiveness of Ederle’s training. Option B is incorrect because the difficulties Ederle encountered were only partially relieved by her team, and her team’s efforts to ensure Ederle’s safety is not explained in the

passage. Option C is incorrect because the paragraph does not focus on the relationship between the problems Ederle encountered at the start of her swim and the problems she encountered during or near the end of her swim.

22. (H) The question asks for an explanation of how paragraph 7 contributes to the development of a central idea of the passage. Paragraph 7 is mainly about Ederle’s physical and emotional state as she pushed through a difficult portion of her swim and realized her goal was in sight. A central idea of the passage is that Ederle’s passion and determination allowed her to accomplish her goal of being the first woman to cross the English Channel. Option H is correct because it emphasizes her passion by referring to the overwhelming emotions Ederle felt as she progressed during her swim, despite the unfavorable conditions (paragraph 7: “For hours Ederle swam, dodging debris with an amused smile” and “Yet Ederle felt indescribably happy as she churned through the sea.”). Option E is incorrect because, although Ederle needed physical strength and mental fortitude to complete the swim, the paragraph contributes to a central idea because it highlights her emotion as she swam, not her physical strength or mental fortitude. Option F is incorrect because the paragraph focuses on Ederle’s emotional response to the challenging circumstances and not the idea that Ederle was at the “edge of her physical capabilities.” Option G is incorrect because Ederle’s feelings of happiness and amusement were caused by her anticipation and excitement as she approached achieving her goal, not by the severe weather.

23. (A) The question asks for an explanation of how Ederle’s successful swim across the channel affected American attitudes. Option A is correct because the passage indicates that there was a large increase in the number of American men and women who became physically active and who obtained swimming certificates shortly after Ederle’s swim (paragraph 9: “Over the next few years, more than 60,000 people credited her with motivating them to earn their American Red Cross swimming certificates.”). Option B is incorrect because, although there was an increase in the number of people learning to swim, the passage does not provide details about people who were inspired by Ederle to take on extreme challenges such as swimming across the channel. Option C is incorrect because, although Ederle did, in fact, surpass the men’s time for the swim by two hours, the passage does not provide information about how this achievement affected the American people’s perception of the capabilities of men and women.

Option D is incorrect because, although the passage does explain how Ederle’s determination and perseverance led to her eventual success, it does not demonstrate how this affected American attitudes toward overcoming failures.

24. (H) The question asks for the sentence from the passage that best conveys the author’s perspective about the impact of Ederle’s swim. Option H is correct because, throughout the passage, the author emphasizes that Ederle’s accomplishment was memorable and great, which is best stated in the sentence from paragraph 8. The sentence presented in Option E is incorrect because it focuses on Ederle’s personal attributes that allowed her to successfully complete her swim, not the author’s perspective about the impact of her achievement. The sentence presented in Option F is incorrect because the details in the sentence relate to Ederle’s state of mind as she came closer to achieving her goal and does not provide details about the author’s opinion of the impact of Ederle’s accomplishment. The sentence presented in Option G is incorrect because it simply presents Ederle’s emotional state as she nears her goal and does not provide information about the author’s perspective.

25. (A) The question asks for an explanation of how the table at the end of the passage contributes to the development of the topic of the passage. The table provides information about the earliest speed records set for crossing the channel, including Ederle’s, and information about present-day records, which are much faster. Option A is correct because the information in the table develops the topic of Ederle’s historic swim across the channel by indicating that people have continued to swim the channel and have found new ways to set speed records over time. Option B is incorrect because, even though the table presents the time for the current female record holder, there is no indication in the passage or in the table that the record holder was inspired by Ederle. Option C is incorrect because the passage does not provide information about other female swimmers’ successful swims across the channel. Option D is incorrect because, although the table allows for the comparison of times, the topic of the passage is related to Ederle’s record in comparison with other swimmers of her time, not present-day swimmers.

Excerpt from *A Tramp Abroad*

26. (F) The question asks about the phrase, which highlights the behavior of ants from different parts of the world, and about what the inclusion of the phrase shows about the author. Option F is correct because the

phrase is meant to communicate a caution that while the author believes most ants are foolish, his observations in the excerpt do not apply to all types of ants. Option E is incorrect because, in the excerpt, the author is comparing species of ants to one another and not to other living creatures. Option G is incorrect because the author never comments in the excerpt that challenging common or strongly held beliefs is, in general, difficult. Option H is incorrect because the author never expresses in the excerpt the idea that the conclusions drawn about the ants' behavior are flawed; the reference to Swiss and African ants is meant to show that those ants are an exception.

27. (A) The question asks how the central idea that “the average ant is a sham” (paragraph 1) is expressed in the excerpt. The excerpt focuses on the author’s humorous explanation of the ineffective struggles of two ants to accomplish a task, and the excerpt concludes with the statement that ants are not as smart as people think: “the ant has been able to fool so many nations” (paragraph 4). This point is stated in Option A. Option B is incorrect because the reference to ants in other locations is a detail mentioned only in paragraph 1 and is not directly related to the central idea mentioned in the question. Option C is incorrect because, while the narrator does observe the ants, the observations made are highly opinionated and not characterized as especially insightful or perceptive. Option D refers to the detail in paragraph 2 that states that the objects ants seek out are “generally something which can be of no sort of use to himself or anybody else” (paragraph 2), but this is not the main way the author conveys the premise that ants are a sham or false, and therefore, Option D is incorrect.

28. (H) The question asks for an explanation of how the words “grabs” “yanks,” and “tearing away” (paragraph 2) contribute to the meaning of the excerpt. Option H is correct because these words convey sudden movements as the ant becomes more upset in his efforts to transport the grasshopper leg. Option E is incorrect because the ant is never described in the excerpt as believing his work to be important. Option F is incorrect because the ant’s inability to make progress while transporting the grasshopper leg by himself demonstrates the ant’s inefficiency (paragraph 2: “At the end of half an hour he fetches up within six inches of the place he started from”). Option H is incorrect because the ant does not complete his tasks despite moving in a hurried and determined way (paragraph 2: “not calmly and wisely, but with a frantic haste which is wasteful of his strength”).

29. (C) The question asks for an explanation of how the details in the sentence convey the central idea, which is that the ant makes poor choices because of his lack of intelligence and his inability to understand even the most basic problem or obstacle. Option C is correct because the author’s description of the ant climbing up and over the weed rather than simply going around the weed supports the central idea. Option A is incorrect because, although the ant does waste much of his strength, the idea conveyed in the sentences is more related to the ant’s inability to solve a problem in the simplest way (paragraph 2: “which is as bright a thing to do as it would be for me to carry a sack of flour from Heidelberg to Paris by way of Strasburg steeple”). Option B is incorrect because the idea that the ant is surprised by the amount of effort needed to carry the object is not a central idea of the excerpt; nor does the excerpt suggest that the ant is surprised by this in the first place. Option D is incorrect because the ant has already acquired the object, and the details in the sentence do not convey an idea about the ant’s unnecessary effort.

30. (H) The question asks for the text from the passage that explains why the author finds the behavior of the ants fascinating. The author’s purpose in describing the excessively foolish actions of the ants is to prove his argument that in spite of what people have long believed, ants are completely lacking in intelligence. Option H is correct because the quoted text in Option H shows the author’s interest in the difference between public opinion and observed truth. Option E is incorrect because the quoted text in Option E provides details that reflect the author’s basic interest, but this observation does not extend to the level of fascination. Option F is incorrect because the author’s main message in the excerpt is that the ant, however industrious, is foolish. Option G is incorrect because the quoted text in Option G also provides details that would reflect a basic interest and observation but that do not extend to fascination.

31. (B) The question asks how the sentence, which states that the ant ends up only six inches from his original starting point, contributes to the central idea of the excerpt. Option B is correct because it explains how the idea in the sentence supports the central idea that “the average ant is a sham” (paragraph 2) by emphasizing his lack of progress and wasted effort. Option A is incorrect because, while the author recognizes the pointlessness of the efforts, the ant never becomes aware that his efforts are purposeless. Option C is incorrect because the ant ending up only six inches from his starting point suggests pointless effort, not an industrious or productive attitude. Option D is incorrect because the emphasis of

the sentence is on the ant’s wasted effort, not the difficulty and time involved, which the ant never realizes or evaluates.

32. (G) The question asks for a sentence in the excerpt that supports the idea that the ant’s “leather-headedness” (paragraph 4), or the ant’s stubborn determination to engage in foolish and worthless actions, amounts to ignorance and idiocy. Option G is correct because, in the sentence in Option G, the ant realizes he is in the wrong place only after wasting effort and strength, which reveals his stupidity and lack of awareness. Option E is incorrect because the sentence in Option E poses the question that the ant should ask himself and does not demonstrate the ant’s ignorance and idiocy. Option F is incorrect because the sentence in Option F simply describes the ant’s action of lifting the grasshopper leg into a position to carry it. Option H is incorrect because, while the sentence in Option H describes the ant’s exhaustion, which is caused by his stubborn determination, the sentence does not provide a connection to the ant’s leather-headedness.

33. (B) The question asks for an explanation of how the sentence, which highlights the second ant’s interest in the grasshopper leg, fits into the structure of the excerpt. Option B is correct because the sentence shows a shift from paragraph 2, which analyzes the actions of the first ant alone, to paragraph 3, which comments on the conversation between the two ants and the ensuing efforts of the two ants together. Option A is incorrect because the idea that the ant seeks out worthless items, such as a grasshopper leg, is established in paragraph 2 (“it is generally something which can be of no sort of use to himself or anybody else”). Option C is incorrect because paragraph 3 is a continuation of the author’s tale and not an expansion of the focus of his commentary. Option D is incorrect because the author does not compare the purposefulness of the two ants.

34. (E) The question asks for an explanation of how the word choice in the sentence adds to the meaning of the excerpt. The image the author creates of two sweating ants abandoning the grasshopper leg to look for “an old nail,” which an ant would want because it is “valueless,” is comical, as suggested in Option E. Option F is incorrect because it is a misinterpretation of the excerpt, as the ants are not confused but are acting decisively (paragraph 3: “Then they go at it again, just as before”). Option G is incorrect because the ants find moving heavy objects to be an amusing way to spend their time and are not aware enough to feel frustrated (paragraph

3: “something else that is heavy enough to afford entertainment and at the same time valueless enough to make an ant want to own it”). Option H is incorrect because the ants are willingly giving up on their object (paragraph 3: “decide that dried grasshopper legs are a poor sort of property after all”).

35. (C) The question asks how the second ant, a friend, influences the first ant. Option C is correct because the friend’s complimentary remark about the grasshopper leg serves to encourage the first ant to continue his efforts to drag the useless object home (paragraph 2: “Evidently the friend remarks that a last year’s grasshopper leg is a very noble acquisition”). Option A is incorrect because the first ant does not know where his home is (paragraph 2: “He doesn’t know where home is. His home may be only three feet away; no matter, he can’t find it”). Option B is incorrect because, while the friend offers to help the first ant (paragraph 3: “Evidently the friend contracts to help him freight it home”), he does not inspire a new approach to resolving the situation. Option D is incorrect because, while the friend does make it difficult for the first ant to transport the grasshopper leg, the friend is not intentionally trying to prevent the first ant from reaching home (paragraph 3: “Then, with a judgment peculiarly antic [pun not intentional], they take hold of opposite ends of that grasshopper leg and begin to tug with all their might in opposite directions”).

Ruins of a Fabled City

36. (G) The question asks for the sentence that best summarizes the central idea of the passage. The idea that there was much speculation about Great Zimbabwe is explained at the end of paragraph 1 and in paragraph 2, and the details about how modern archaeologists determined its origins are explained in paragraph 5. Option G best represents the central idea that is developed and supported throughout the passage. Option E is incorrect because it does not fully express the central idea of the passage: it includes facts from only the beginning of the passage and does not take into account the discoveries revealed about Great Zimbabwe in paragraph 5. Option F is incorrect because it focuses mainly on the idea that archaeologists are still interested in the mysteries of Great Zimbabwe (paragraph 6) and does not fully explain the central idea. Option H is incorrect because the fact that early excavations of Great Zimbabwe caused the destruction of valuable evidence is a detail from paragraph 4, and the option does not fully convey the central idea of the passage.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

37. (B) The question asks for an explanation of how Mauch’s conclusions influenced later investigations. Option B is the best option because Mauch’s conclusion that Great Zimbabwe “had been built by the Queen of Sheba” (paragraph 4) affected later investigations of the ruins by causing archaeologists to destroy evidence without examining it, as they assumed that Mauch’s conclusions were accurate (paragraph 4). Option A is incorrect because, while archaeologists were interested in the area, this was not the main effect of Mauch’s conclusions, as described in the passage. Option C is incorrect because people searched for Great Zimbabwe because they already believed the stories told by Arab traders and historians like de Barros (paragraph 2), not because of Mauch’s conclusions. Option D is incorrect because, although the city was considered impressive (paragraph 3), Mauch’s conclusions did not influence whether people believed an ancient culture could have built the city.

38. (E) The question asks for the statement that best summarizes the Portuguese explorers’ experience. Option E is correct; the Portuguese repeatedly searched for King Solomon’s gold, which they associated with East Africa, but they never found the city (paragraph 2). Option F is incorrect because, while they did hope to find a city, the explorers’ overall experience was focused on finding wealth. Option G is incorrect because the information in paragraph 2 does not support the idea that the explorers used details from de Barros’s story to find the city’s location. Option H is incorrect because the explorers heard stories about the possible wealthy city, but they did not study “history books in order to gather information about the city.”

39. (D) The question asks for the specific conclusion that was able to be drawn from the excavations at Great Zimbabwe. Option D is the correct answer because paragraph 5 states that carbon-14 dating proved Randall-MacIver and Caton-Thompson’s conclusion that Great Zimbabwe was built by ancestors of the Shona people during the fourteenth or fifteenth century. Option A is incorrect because the mystery behind “why the settlement was abandoned” has not been solved. Option B is incorrect because the disappearance of the city’s ivory and gold is a mystery that has not been solved. Option C is incorrect because the reason that Europeans did not discover Great Zimbabwe until the 1870s has not been explained.

40. (F) The question asks for the best supported evidence the passage provides about the Shona people. The

Shona people are discussed in paragraph 5, where it is explained that Great Zimbabwe was discovered to have been built by the ancient ancestors of the Shona people, making Option F correct. Option E is incorrect because the ancient Shona people lived in the African interior, not on the coast, and the passage does not give specific details about where the Shona people live presently. Option G is incorrect because the passage does not give a detailed history about the origins and locations of the Shona people in Africa. Option H is incorrect because, while early explorers were looking for King Solomon’s gold and evidence of the Queen of Sheba in Africa, the Shona people were not found to be linked to these people.

41. (D) The question asks for the impact of Randall-MacIver and Caton-Thompson’s discovery. David Randall-MacIver and Gertrude Caton-Thompson’s conclusions were significant because their excavation of the ruins revealed that Great Zimbabwe was most certainly built by the ancestors of modern-day Africans (paragraph 5), discrediting the long-standing idea that the structure was Middle Eastern in origin. This conclusion is stated in Option D. Option A is incorrect because paragraph 5 states that Randall-MacIver and Caton-Thompson determined that the city was likely built in the fourteenth or fifteenth century, which was later than earlier explorers had assumed. Option B is incorrect because the question of why the great city was abandoned was not part of Randall-MacIver and Caton-Thompson’s discovery. Option C is incorrect because, while paragraph 5 also indicates that the Shona society was strong and healthy, this idea was not the main focus of Randall-MacIver and Caton-Thompson’s discovery.

Cross-Purposes

42. (E) The question asks how the similarity in the construction of lines 1 and 8 contribute to the meaning of the poem. By beginning lines 1 and 8 with “What I am is,” each speaker establishes its defining feature, both of which are stated in Option E. Option F is incorrect because the focus of the lines is defining the speakers’ individuality, not how one speaker resolves a problem created by the other. Option G is incorrect because the structure is not stating in line 1 that it is limited because it was built to stand in place; on the contrary, the structure is stating that this sense of purpose and permanence is its strength. Option H is incorrect because, in these lines, each speaker is trying to establish its stability, which for the structure is based on strength and for the water is based on longevity.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

43. (B) The question asks how the lines contribute to the development of a central idea in the poem. The lines “I am what every athlete / wants” (lines 2–3) and “I am the blood flowing in the runner's chest” (line 12) communicate that each speaker is an object of admiration and a powerful force, so Option B is correct. Option A is incorrect because nothing in the language of the lines communicates control. Option C is incorrect because the lines describe opposing characteristics: the structure's description conveys stillness—remaining “up in the air” (line 4)—while the water's description conveys movement—“flowing in the runner's chest” (line 12). Additionally, the idea that the speakers fail to recognize similarities is not part of a central idea. Option D is incorrect because there is no evidence in the poem that the two speakers understand that they are interrelated.

44. (E) The question asks how the line contributes to the development of ideas in the stanza. The line mentions swallows and ospreys, birds that use the structure's trusses as their home; this reference supports the claim that the structure is beneficial to nature, so Option E is correct. Option F is incorrect because the line doesn't hint at jealousy in the tone or language, but rather the line is promoting the structure's helpful characteristic. Option G is incorrect because, in the line, the structure is not making a comparison with the water. Option H is incorrect because, in the line, the structure is not implying that it is related to nature but rather that it is helpful to nature.

45. (C) The question asks for the impact that the phrases have on the meaning of the poem. The phrases “some tears dribbling” and “running down” (lines 18–19) imply weakness in form and being influenced by the landscape, making Option C correct. Option A is incorrect because, while the lines do describe the water in populated areas, they do not describe the water as a problem for the people living there. Option B is incorrect because the lines do more than bring attention to different types of water; the lines make a judgment about the strength and importance of the water. Option D is incorrect because a comparison is not made based on the volume of water streaming from the mountains and the volume of water in the seas.

46. (H) The question asks what the comparison in lines 33–35 shows about the structure of the poem. The speaker states, “We are steel thread to the human needle” (line 34), which illustrates that the structure (and others like it) is a tool used by humans to “bind . . . up” (line 35) or overcome “the rip” (line 33) that the water creates in the earth, making Option H correct. Option E is incorrect because the language in the lines is used only to imply the flaw that the water creates—“the rip you make” (line 33). Option F is incorrect because, while the water states that it enables “empires to rise” (lines 25), implying that it is needed for society to thrive, it never shares a purpose of bringing people together through its existence. Option G is incorrect because the language used for sewing (“We stitch across the rip you make” [line 33]) indicates the repair of a flaw and not the establishment of boundaries.)

47. (D) The question asks how the last stanza conveys a central idea of the poem. In lines 36–38, the speaker (the water) describes how its “vapors cling” to the structure, bringing out the structure's “softness” and “rust,” thus destroying the structure over time. Also, in line 42, the speaker says it is “patient” and “will wait for you,” suggesting that the speaker will be around after the structure is gone. These phrases in the last stanza indicate that Option D is correct. Option A is incorrect because the last stanza includes no indication that the structure and the water depend on each other. Option B is incorrect because the last stanza refers to the opposing speaker (the structure) and not to any other structure. Option C is incorrect because the last stanza addresses only the idea that the structure will grow weak and obsolete over time.

48. (E) The question asks how the implication in lines 41–42 is supported by other lines in the poem. The words “patient” and “wait” in line 42 suggest that the speaker (the water) has the ability to outlast the other speaker because the water doesn't weaken as it ages, making Option E (lines 8–9) the correct response. Option F is incorrect because the promise made in line 42 is not affected by whether the water was built by humans (lines 9–10). Option G is incorrect because, in line 14, the water's ability to wait longer than the structure is not enhanced by what flows through the water. Option H is incorrect because, in line 26, the water's knowledge does not make its ability to wait any stronger—rather, its seemingly unending lifespan does.

49. (D) The question asks how the poet develops the two points of view. The poet develops the two

speakers' points of view by personifying (giving human characteristics to something nonhuman, such as an object or animal) the structure and the water, allowing them to debate by criticizing each other and declaring their own importance. Thus, Option D is correct. Option A is incorrect because future civilizations do not play a significant role in the development of points of view. Option B is incorrect because, while the speakers do discuss their impact on the environment, there is no narrator speaking for them. Option C is incorrect because these details do not convey points of view.

50. (G) The question asks how the form of the poem contributes to its meaning. The alternating positions of the stanzas create the appearance of a conversation in which the speakers share their opposing points of view, making Option G correct. Option E is incorrect because the number of lines for each stanza does not emphasize the importance of the two speakers. Option F is incorrect because italics are used mainly to designate the voice of the second speaker (the water). Option H is incorrect because the lack of rhyme scheme or meter is intended to create a conversational tone, rather than reflect the changes the water causes or experiences.

A Year without a Summer

51. (B) The question asks for the best summary sentence for the passage. The passage is mostly about the strange, cold summer of 1816 and speculation around its cause, which is best stated in Option B. Option A is incorrect because it is a detail in paragraph 3 about one theory regarding the cause of the weather. Option C is incorrect because the passage is about more than agriculture in New England (paragraphs 1 and 2). Option D is incorrect because it is a detail in the passage mentioned only in paragraph 1.

52. (E) The question asks for the sentence that provides the best reason for the farmers replanting their crops. Paragraph 2 states that “farmers prepared to plow and plant” because they “expected warm temperatures” and were “optimistic.” This suggests that the farmers kept replanting their crops because they expected the weather to return to normal, which is reflected in Option E. Option F is incorrect because the cold weather and the snow actually worsened growing conditions (paragraph 2). Option G is incorrect because, while “July and August brought little improvement” (paragraph 2), it is throughout the month of June that farmers replanted crops. Option H is incorrect because, while the farmers kept replanting their crops with the expectation of normal

weather to return, the passage does not state that was because the farmers thought the snow would provide moisture.

53. (C) The question asks for the outcome that is best implied by the situation the New Englanders faced in 1816. Option C is the correct answer because, with many crops “stunted or destroyed” (paragraph 2) in the summer of 1816, one would expect food shortages the following winter. Option A is incorrect because cold weather was familiar to the population in New England, just not for such an extended period of time. Option B is incorrect because there is no evidence in the passage that people experienced warmer temperatures. Option D is incorrect because, although some farmers did replant their crops, there is no evidence in the passage that they struggled to adjust to a different timeline for farming.

54. (F) The question asks for the purpose and importance of paragraph 3 to the passage. Paragraph 3 describes how nineteenth-century religious and other leaders tried to account for the cooler weather in 1816. Some leaders thought it was “the end of the world,” “sunspot activity,” or the proliferation of a new invention. How this information contributed to the passage is stated in Option F. Option E is incorrect because the causes described in paragraph 3 were not the most probable cause, as “the first plausible explanation”—Bessel’s—is described later in the passage. Option G is incorrect because more than one theory is presented in paragraph 3. Option H is incorrect because the ideas described are not included in paragraph 3.

55. (B) The question asks why the details about the eruption of Mount Tambora are included in the passage. The details in paragraph 4 about the eruption highlight the severity of the eruption and how it clouded the atmosphere and eventually encircled the world, making Option B the correct answer. Option A is incorrect because the passage does not support the idea that the effects are still present today. Option C is incorrect because the details may include information about what happens during an eruption, but the author is specifically describing the event at Mount Tambora as the inception of weather issues all over the world. Option D is incorrect because, while it is possible that people perceive natural events in various parts of the world differently, the specific details about the force and magnitude of the eruption do not emphasize this idea.

56. (H) The question asks for the implied meaning behind the phrase “the global nature of weather”

(paragraph 5). This phrase refers to how conditions in one part of the world can affect weather in another part of the world. Option H is correct because it clarifies “global” by explaining the relationship between weather and conditions all over the world. Option E is incorrect because the phrase in paragraph 5 is about the effects of weather conditions around the world, not about making weather predictions. Option F is incorrect because it discusses the lasting impact on specific geographical areas, while the phrase “the global nature of weather” refers to events that affect the entire world. Option G is incorrect because, while weather events (the unusually cold summer in New England in 1816) can be related to natural disasters (a volcano eruption), there is no support in the passage for the idea that natural disasters tend to occur at the same time.

57. (D) The question asks for the likely cause of the cold summer of 1816, based on the reason given in the passage. Researchers today believe that Bessel’s theory that “dust particles screened portions of Earth from the warming rays of the sun” is the most logical and probable (paragraph 5). His ideas are summarized in paragraph 4, and Option D restates his theory, making Option D the correct answer. Option A is incorrect because this was a possibility considered by some leaders, but there is no evidence in the passage that this theory was supported by thorough scientific research. Option B is incorrect because this theory was thought to be a possible cause by some people, but Bessel’s theory is the most probable. Option C explains damage that was caused by the Mount Pinatubo eruption in 1991 (paragraph 1), but that damage is not the cause of the cold summer of 1816.

- 58. (162)** First, find the measure of angle PQR. The measure of angle PQR is equal to the measure of angle PSR.

$$m\angle PSR = 180 - 72 = 108.$$

So, the measure of angle PQR is also 108.

$$108 + 90 + x = 360$$

$$198 + x = 360$$

$$x = 162$$

- 59. (99)** Let x be the number of oak trees when 264 pine trees are planted. Set up a proportion and solve for x :

$$\frac{x}{264} = \frac{3}{8}$$

$$8x = 762$$

$$x = 99$$

- 60. (-4)** $4w = 2w - 8$
 $2w = -8$
 $w = -4$

- 61. (45)** Let x = number of students with only cats as pets.

Let y = number of students with only dogs as pets.

Calculate x and y using the given information: There are 20 students who have cats, and of those 20 students, 3 have both cats and dogs. Thus, $x = 20 - 3 = 17$. There are 23 students who have dogs, and of those 23 students, 3 have both cats and dogs. Thus $y = 23 - 3 = 20$.

To find the total number of students surveyed, add the number of students who only have cats (x), the number of students who only have dogs (y), the number of students who have both (3), and the number of students who have neither (5):
 $3 + 5 + x + y = 8 + 17 + 20 = 45$

- 62. (63)** 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:

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

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

- 63. (B)** $2k = m + 3$ so $k = \frac{m+3}{2}$.

Substitute each value of m to find the values of k :

$$k = \frac{5+3}{2} = \frac{8}{2} = 4$$

$$k = \frac{7+3}{2} = \frac{10}{2} = 5$$

$$k = \frac{9+3}{2} = \frac{12}{2} = 6$$

The set k is $\{4, 5, 6\}$.

- 64. (F)** $7 + 3n + 6 - 4n - 8 =$
 $(7 + 6 - 8) + (3n - 4n) =$
 $5 - n$

- 65. (A)** The sum of Adrianna's course grades equals 4 times the mean (average) of her grades: $90 \times 4 = 360$. Roberto has the same sum (360) as Adrianna. Find the mean of his course grades:

$$360 \div 5 = 72$$

EXPLANATIONS OF CORRECT ANSWERS *continued...*

66. (H) 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 .
 $J - 5 = (K + 5) + 10$
 $J - 5 = \left(\frac{J}{2} + 5\right) + 10$
 $J - 5 = \frac{J}{2} + 15$
 $J = \frac{J}{2} + 20$
 $\frac{J}{2} = 20$
 $J = 40$ marbles

67. (A) Let x be the number of inches representing 1 foot. Set up a proportion and solve for x :
 $\frac{x}{1} = \frac{0.125}{125}$
 $x = 0.001$ in.

68. (G) First, add the percentage of cars containing 3 people, 4 people, and 5 or more people:
 $15\% + 7\% + 3\% = 25\%$
 Thus, 25% of the cars contained **at least** 3 people, so use that to calculate the number of cars:
 $420 \times 0.25 = 105$ cars.

69. (B) Line segment \overline{RS} is the altitude, or height, of triangle QRP. The length of \overline{QP} is 8 cm. Use that information to find the area of triangle QRP:
 $A = \frac{1}{2}bh = \frac{1}{2}(8)(6) = 24$ sq cm.
 There are 4 congruent triangles in the pyramid, so the surface area is $4 \times 24 = 96$ sq cm.

70. (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
 $2(2x) + 2(3x) = 510$
 $4x + 6x = 510$
 $10x = 510$
 $x = 51$
 $2x = 102$ cm and $3x = 153$ cm

71. (D) Multiply each term by 2 to eliminate the fraction, and isolate x :
 $-4(2) < \left(\frac{x}{2}\right)(2) < 2(2)$
 $-8 < x < 4$
 Therefore, x must be between -8 and 4 .

72. (F) Use proportions to make the conversions:

Lorgs to dollars:

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

$$7x = 140$$

$$x = \$20$$

Dalts to dollars:

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

$$0.5x = 16$$

$$x = \$32$$

Total dollars = 20 + 32 = \$52

73. (B) Let x be the total number of colored pencils in the box. Set up a proportion to find x :

$$\frac{2}{7} = \frac{6}{x}$$

$$2x = 42$$

$$x = 21$$

If there are 6 red pencils, then the number of pencils that are not red is $21 - 6 = 15$.

74. (H) Since both ratios have y in common, solve for x and z in terms of y in both equations.

Using $x:y = 1:4$, solve for x in terms of y .

$$\frac{x}{y} = \frac{1}{4}$$

$$x = \frac{1}{4}y$$

Using the ratio $y:z = 4:5$, solve for z in terms of y :

$$\frac{y}{z} = \frac{4}{5}$$

$$z = \frac{5}{4}y$$

The question states $x + y + z = 50$.

Substitute from the two equations above and solve for y .

$$\frac{1}{4}y + y + \frac{5}{4}y = 50$$

$$\frac{10}{4}y = 50$$

$$10y = 200$$

$$y = 20$$

75. (B) The shaded region is a right triangle. Each leg is 1 unit in length. So the area is

$$A = \frac{1}{2}bh = \frac{1}{2}(1)(1) = \frac{1}{2} \text{ or } 0.5 \text{ sq unit}$$

76. (F) Create a table with the information provided in the problem and use subtraction to fill in the rest of the table:

	Female	Male	TOTAL
Commutes to work	21%	39% (60 - 21)	60%
Does not commute to work	24% (45 - 21)	16% (40 - 24)	40% (100 - 60)
TOTAL	45%		100%

16% of the population is male and does not commute to work.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

- 77. (A)** Let x be the price per pound for the meat. Set up an equation to show what Mrs. Cranston spent:

$$5(0.90) + 8x = 26.90$$

$$4.50 + 8x = 26.90$$

$$8x = 22.40$$

$$x = 2.80$$

The price per pound for the meat is \$2.80.

- 78. (E)** The probability that both cards are not blue is the same as the probability that both cards **are** red. There are 4 red cards out of the 10, so the probability of the first card being red is $\frac{4}{10}$. Now there are 9 cards left, and 3 of those are red, so the probability of the second card being red is $\frac{3}{9}$. Multiply the two probabilities to find the probability that both cards are red (not blue):

$$\frac{4}{10} \times \frac{3}{9} = \frac{12}{90} = \frac{2}{15}$$

- 79. (D)** 1 sind = 4 lorqs, so 1 sind > 1 lorq.
 2 harps = 5 sinds, so 1 harp > 1 sind.
 1 plunk = 3 harps, so 1 plunk > 1 harp, meaning that 1 plunk > 1 sind and 1 lorq.
 2 plunks = 5 dalts, so 1 plunk > 1 dalt.
 Therefore, the plunk is the most valuable.

- 80. (G)** For each row, multiply the number of students by the score. Then add those together and divide by the total number of students to find the mean (average) of the 10 students.

$$\frac{85(4)+75(4)+65(2)}{10} = \frac{340+300+130}{10}$$

$$= \frac{770}{10} = 77$$

- 81. (B)** According to the chart, 22% of people walk to work and 4% ride a bicycle. Subtract to find the percentage of how many more people walk than bicycle:

$$22\% - 4\% = 18\%$$

To find the exact number of people, multiply 18% (0.18) by the number of people working in Center City (15,000):

$$15,000 \times 0.18 = 2,700$$

- 82. (F)** To find the smallest factor of 91, list the factors: 1, 7, 13, and 91.

The smallest factor (other than 1) is 7.

Of the options listed (30, 35, 39, and 44), only 35 is a multiple of 7.

- 83. (D)** Let x be the remaining side of the actual banner. Set up a proportion:

$$\frac{x}{16} = \frac{36}{12}$$

$$x = 48 \text{ ft}$$

- 84. (F)** Let x be the number of second-, third-, and fourth-year students. Then the total number of students in the college is $663 + x$. Set up a proportion and solve for x :

$$\frac{15}{1} = \frac{663+x}{179}$$

$$663 + x = 179(15)$$

$$663 + x = 2,685$$

$$x = 2,022$$

- 85. (D)** $2\frac{1}{5} + 3\frac{3}{10} + 4\frac{2}{5} + 5\frac{1}{2}$

Convert all the fractions to a common denominator (10):

$$2\frac{2}{10} + 3\frac{3}{10} + 4\frac{4}{10} + 5\frac{5}{10}$$

$$= (2 + 3 + 4 + 5) + \left(\frac{2+3+4+5}{10}\right)$$

$$= 14 + 1\frac{4}{10} = 15\frac{2}{5}$$

- 86. (F)** Divide the rate by the number of seconds in an hour. (Since there are 60 minutes in an hour and 60 seconds in a minute, multiply $60 \times 60 = 3,600$ seconds in an hour):

$$\frac{55}{3,600} \text{ miles per second}$$

Multiply by the number of feet in a mile (5,280):

$$\frac{55 \cdot 5,280}{3,600} \text{ feet per second}$$

- 87. (D)** First, set up an equation to express Tien’s age (T) and Jordan’s age (J) today:

$$T = \frac{1}{4}J$$

Two years from now, Tien’s age will be $T + 2$, and Jordan’s age will be $J + 2$. Set up an equation about the relationship between Tien’s age and Jordan’s age in two years:

$$T + 2 = \frac{1}{3}(J + 2)$$

Solve the above equation for T :

$$T = \frac{1}{3}(J + 2) - 2$$

Now set the two equations equal to each other and solve for J :

$$\frac{1}{4}J = \frac{1}{3}(J + 2) - 2$$

$$\frac{1}{4}J = \frac{1}{3}J - \frac{4}{3}$$

$$-\frac{1}{12}J = -\frac{4}{3}$$

$$J = -\frac{4}{3}\left(-\frac{12}{1}\right)$$

$$J = 16$$

- 88. (E)** List the factors of 48:

1 and 48, 2 and 24, 3 and 16, 4 and 12, 6 and 8

There are no factors greater than 24 and less than 48.

- 89. (C)** The first integer is l , so the second is $l + 1$, the third is $l + 2$, then $l + 3$, and finally $l + 4$. Since g is the fifth and greatest of the integers, $g = l + 4$.

Substitute $l + 4$ for g and simplify:

$$\frac{l+g}{2} = \frac{l+l+4}{2} = \frac{2l+4}{2} = l + 2$$

- 90. (H)** Three years is 36 months (12×3). Set up an expression to find the total amount Johan paid:

$$1,000 + 300(36) = \$11,800$$

- 91. (B)** Create a list of the possible pairs. Let the cookies be named A, B, C, D, E, and F.

AB, AC, AD, AE, AF
BC, BD, BE, BF
CD, CE, CF
DE, DF
EF

There are a total of 15 possible pairs of cookies that Aiden can choose.

- 92. (G)** Set up proportions to figure out how many slides Deion and Kyra can create in 1 hour:

Deion

$$\frac{5}{20} = \frac{x}{60}$$

$$20x = 300$$

$$x = 15$$

Deion can create 15 slides in 1 hour.

Kyra

$$\frac{3}{10} = \frac{x}{60}$$

$$10x = 180$$

$$x = 18$$

Kyra can create 18 slides in 1 hour.

Add Deion and Kyra to figure out how many slides they can create together in 1 hour:

$$15 + 18 = 33.$$

EXPLANATIONS OF CORRECT ANSWERS *continued...*

93. (C) Since $LN = \frac{1}{8}$, point N is located at $4\frac{5}{16} + \frac{1}{8} = 4\frac{7}{16}$. So M must be between point L, $4\frac{5}{16}$, and point N, $4\frac{7}{16}$. Point L can also be written as 4.3125, and point N can be written as 4.4375. The only option given that lies between those two points is 4.35.

94. (G) The length of the stick must be the greatest common factor of 72 and 30. The factors of 30 are 1, 2, 3, 5, 6, 10, 15, and 30. Of those, only 1, 2, 3, and 6 are also factors of 72. The greatest of these is 6.

95. (B) Ryan has 130 pages left to read ($150 - 20$). He read 20 pages in 30 minutes, which means he read at a rate of 40 pages per 1 hour. To find out how much longer it will take him to finish the assignment, divide the total number of pages remaining (130) by the number of pages he is able to read per hour (40):

$$\frac{130}{40} = 3\frac{1}{4}$$

96. (G) It is easier to rewrite $\frac{M}{N}$ as $M \div N$ since they are both fractions.

$$M \div N = \frac{w}{x} \div \frac{y}{z} = \frac{w}{x} \cdot \frac{z}{y} = \frac{wz}{xy}$$

97. (B) The question asks for integers from 12 to 30 that are not divisible by 2 or 3.

The set of consecutive integers is {12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30}.

Since all even numbers are divisible by 2, eliminate all even numbers, leaving the odd numbers in the set: {13, 15, 17, 19, 21, 23, 25, 27, 29}.

Eliminate those integers that are multiples of 3 (15, 21, and 27). The remaining integers are: {13, 17, 19, 23, 25, 29}. Therefore, there are 6 numbers in the set that are multiples of **neither** 2 nor 3.

98. (G) Take each city's number of schools and multiply by the number of students. It is not necessary to calculate all 5 of these. Cities M and N have the same number of students, so just calculate the number of students in City M because it has more schools than City N. The same goes for Q and R — only Q needs to be calculated because it has more schools than R.

$$M = 8 \times 500 = 4,000$$

$$P = 9 \times 400 = 3,600$$

$$Q = 6 \times 700 = 4,200$$

City Q has the greatest number of students.

99. (C) The total number of candies in the box is $5 + 3 + 2 = 10$. The number of candies that are not banana is $5 + 2 = 7$.

The probability of the first candy not being banana is $\frac{7}{10}$. Now, out of 9 candies, there are 6 candies left that are not banana.

The probability of the second candy not being banana is $\frac{6}{9}$. Multiply these two probabilities to get the solution:

$$\frac{7}{10} \times \frac{6}{9} = \frac{42}{90} = \frac{7}{15}$$

100. (H) Solve the equation for z :

$$\frac{w}{x} = \frac{y}{z}$$

$$wz = xy$$

$$z = \frac{xy}{w}$$

101. (C) Convert the ratios into fractions of WZ. Use the sum of the ratios for the denominator.

$$WX:XY:YZ = 4:2:3$$

$$WX = \frac{4}{4+2+3} = \frac{4}{9}$$

$$XY = \frac{2}{4+2+3} = \frac{2}{9}$$

The part of WZ that is WY is the sum of those fractions:

$$WY = \frac{4}{9} + \frac{2}{9} = \frac{6}{9} = \frac{2}{3}$$

Find the length of WZ:

$$WZ = 8 - (-10) = 18$$

The value of WY is $\frac{2}{3}(18) = 12$.

102. (G) Find 1% of 0.02: $0.02 \times \frac{1}{100} = 0.0002$

The greatest allowable thickness would be $0.02 + 0.0002 = 0.0202$ inch.

103. (D) First, calculate the highest score for each section by adding the lowest score to the range:

$$\text{Section I: } 65 + 28 = 93$$

$$\text{Section II: } 62 + 25 = 87$$

$$\text{Section III: } 67 + 22 = 89$$

The overall highest score is 93, and the overall lowest score is 62. Thus the overall range is $93 - 62 = 31$.

104. (F) Since $3n$ is even, then $3n + 1$ must be odd. Thus $3n + 3$ and $3n + 5$ are also odd. So there are a total of 3 numbers in this range that are odd.

105. (D) There are 6 digits in the repeating decimal (769230), so 7 would be the first, seventh, thirteenth digit and so on. To find the 391st digit, divide 391 by 6.

$$391 \div 6 = 65 \text{ R}1$$

Since the remainder is 1, that means the 391st digit is the same as the 1st digit, which is 7.

106. (E) One revolution is equal to the circumference of the tire:

$$C = 2\pi r = 2(1)\left(\frac{22}{7}\right) = \frac{44}{7} \text{ ft}$$

The car travels at 4,400 ft per minute. To calculate the number of revolutions, divide the speed by the circumference:

$$4,400 \div \frac{44}{7} = 4,400 \times \frac{7}{44} = 700 \text{ revolutions.}$$

107. (D) $100(2 + 0.1)^2 - 100 = 100(2.1^2) - 100$
 $= 100(4.41) - 100 = 441 - 100 = 341$

108. (G) The total number of handballs in the container is $4 + 5 + 8 + 9 + 11 = 37$.

Since there are 8 yellow handballs, the probability of selecting a yellow handball is $\frac{8}{37}$.

109. (A) Each chair costs Leon \$150 to make, and he sells the chair for \$275. His profit is found by subtracting the cost from the price:

$$\$275 - \$150 = \$125 \text{ per chair}$$

If Leon makes and sells 25 chairs in a week, his initial profit is $25 \times \$125 = \$3,125$. However, Leon has additional fixed expenses of \$1,250 per week, so this cost must also be subtracted to arrive at the profit. His final profit is $\$3,125 - \$1,250 = \$1,875$.

110. (H) Convert 4 ft 7 in. to inches.

Since 12 in. = 1 ft :

$$4(12) + 7 = 55 \text{ inches}$$

Multiply that by the conversion

$$254 \text{ cm} = 1 \text{ in.}$$

$$55 \times 2.54 = 139.70 \text{ cm}$$

111. (C) First, use $JK = 3\frac{1}{2}$ to find the location of J:

$$\frac{3}{8} - J = 3\frac{1}{2}$$

$$J = \frac{3}{8} - 3\frac{1}{2} = -3\frac{1}{8}$$

Now, use $JM = 9\frac{3}{4}$ to find the location of M:

$$M - \left(-3\frac{1}{8}\right) = 9\frac{3}{4}$$

$$M + 3\frac{1}{8} = 9\frac{3}{4}$$

$$M = 9\frac{3}{4} - 3\frac{1}{8} = 6\frac{5}{8}$$

Finally, use $LM = 1\frac{1}{8}$ to find the location of L:

$$6\frac{5}{8} - L = 1\frac{1}{8}$$

$$L = 6\frac{5}{8} - 1\frac{1}{8} = 5\frac{4}{8} = 5\frac{1}{2}$$

112. (G) $4x - 3y = 12$

$$4x = 3y + 12$$

$$x = \frac{3}{4}y + \frac{12}{4}$$

$$x = \frac{3}{4}y + 3$$

113. (A) First, determine the total number of servings of fruits and vegetables that the students ate by multiplying the number of servings by the number of students in each row of the table. Then add that column to get the total number of servings:

Number of Servings of Fruits and Vegetables	Number of Students	Number of Servings × Number of Students
0	5	0
1	7	7
2	3	6
3	4	12
4	0	0
5	1	5

Total: 30

Calculate the mean by dividing the total number of servings of fruits and vegetables by the total number of students:

$$\frac{30}{20} = 1\frac{1}{2}$$

114. (G) The ratio is 4:3:2:1, so the total parts is 10.

Since there are two parts resin, the fraction of resin is $\frac{2}{10} = \frac{1}{5}$.

So the amount of resin in 30 lb of paste (for 1 billboard) is $\frac{1}{5} \times 30 = 6$ lb. For 4 billboards, that would be $6 \times 4 = 24$ lb.

Answer Key for Sample Form A

1. D	14. H	27. A	40. F	53. C	66. H	79. D	92. G	105. D
2. G	15. C	28. H	41. D	54. F	67. A	80. G	93. C	106. E
3. A	16. H	29. C	42. E	55. B	68. G	81. B	94. G	107. D
4. G	17. A	30. H	43. B	56. H	69. B	82. F	95. B	108. G
5. B	18. G	31. B	44. E	57. D	70. F	83. D	96. G	109. A
6. H	19. C	32. G	45. C	58. 162	71. D	84. F	97. B	110. H
7. D	20. G	33. B	46. H	59. 99	72. F	85. D	98. G	111. C
8. G	21. D	34. E	47. D	60. -4	73. B	86. F	99. C	112. G
9. B	22. H	35. C	48. E	61. 45	74. H	87. D	100. H	113. A
10. H	23. A	36. G	49. D	62. 63	75. B	88. E	101. C	114. G
11. D	24. H	37. B	50. G	63. B	76. F	89. C	102. G	
12. F	25. A	38. E	51. B	64. F	77. A	90. H	103. D	
13. C	26. F	39. D	52. E	65. A	78. E	91. B	104. F	



NEW YORK CITY PUBLIC SCHOOLS

2018 Specialized High Schools

ADMISSIONS TEST

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, 2004, would be 3-1-04.

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

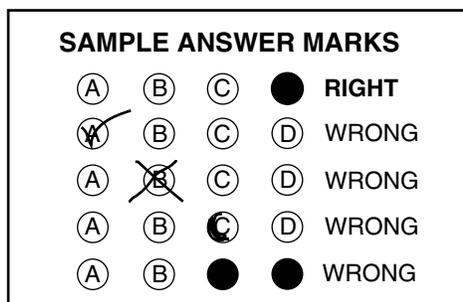
Grid 9 is labeled “BOOKLET LETTER AND NUMBER.” In most cases, Grid 9 is already filled in for you. If it is not, copy the letter and numbers shown in the upper-right corner of your test booklet into the boxes. Below each box, fill in the circle containing the same letter or number as the box.

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.



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 before marking the best answer for each question.

1. Read this sentence.

The Colosseum in Rome, Italy which is considered one of the “new” Seven Wonders of the World, is the largest amphitheater ever built and could hold more than 50,000 spectators.

Which edit should be made to correct the sentence?

- A. Delete the comma after *Rome*.
- B. Insert a comma after *Italy*.
- C. Delete the comma after *World*.
- D. Insert a comma after *built*.

2. Read this paragraph.

In September 2016 the National Museum of African American History and Culture opened as part of the Smithsonian Institution, the museum is already the Smithsonian's third most popular site. Experts say that they expect this newest Smithsonian facility to welcome nearly 4 million visitors a year. The museum features more than 30,000 objects, including Muhammad Ali's boxing gloves and a dress sewn by Rosa Parks. A commemorative copy of the Emancipation Proclamation, written in 1863 during the presidency of Abraham Lincoln, is also on display at the museum.

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

- E. Institution, and the
 - F. year, and the
 - G. objects, which include
 - H. Proclamation, which was written
3. Read this sentence.

To promote their club, a bake sale will be sponsored by members of the debate team on Wednesday.

How should the sentence be revised?

- A. To promote their club, on Wednesday a bake sale will be sponsored by members of the debate team.
- B. On Wednesday to promote their club, a bake sale will be sponsored by members of the debate team.
- C. To promote their club, members of the debate team will sponsor a bake sale on Wednesday.
- D. Members of the debate team, on Wednesday to promote their club, will sponsor a bake sale.

4. Read this paragraph.

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

How should the paragraph be revised?

- E. Sentence 1: Change *spent* to **had spent**, AND insert a comma after *play*.
- F. Sentence 2: Change *did* to **does**, AND insert a comma after *projection*.
- G. Sentence 3: Change *studies* to **studied**, AND delete the comma after *emotions*.
- H. Sentence 4: Change *recited* to **recites**, AND delete the comma after *times*.

CONTINUE ON TO THE NEXT PAGE ►

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 before marking the best answer for each question.

The Local Library

(1) According to a 2015 survey, more than two-thirds of Americans own a smartphone, which means that obtaining information or communicating with people is easier than ever before. (2) With the swipe of a finger, the tap of an icon, or a verbal command, people have instant access to articles, blogs, news, and social networking websites. (3) Even with all these immediately available sources of information, one of the best resources for many members of the community also happens to be one of the oldest. (4) The public library is a great place for people to get information.

(5) The public library serves a truly critical role in promoting community. (6) With the explosion of digital media in recent years, people in different locations can now communicate almost instantaneously. (7) And yet many people complain of feeling more isolated and alone than ever before. (8) The library stands in a rare position to help community members meet this universal need for human connection and companionship.

(9) Furthermore, libraries provide certain amenities, such as access to the Internet, for free to all people. (10) A student who does not have a computer at home can research and type a paper for school. (11) Similarly, an unemployed adult without access to the Internet can make use of library resources to find job opportunities. (12) The free items that are found at the library can help people get a lot done.

(13) Public libraries also offer a variety of resources to community members. (14) One important resource is the local librarian, who does far more than check out books and collect fines. (15) Other library resources include free or low-cost tutoring and training programs. (16) Additionally, lectures, book groups, and town meetings promote critical thinking and community engagement. (17) A typical librarian holds a master's degree and can help library patrons navigate through the flood of information available in print and on the Internet.

(18) The hallmark of a public library is that its materials and services are accessible to all. (19) The library connects people to a network of information and resources and is an important part of a community.

5. Which sentence should replace sentence 4 to best introduce the main claim of the passage?
- A. In this age of smartphones and search engines, the public library is a valuable resource that all members of a community should use.
 - B. Finding information is easier than ever, but going to the public library is still a valuable learning experience.
 - C. Though today’s computers are highly advanced, the resources available at a public library are more useful for students.
 - D. Despite the proliferation of social networking sites, a public library is a great place for people who are interested in improving their community.
6. Which sentence would best follow and support sentence 8?
- E. Libraries, which have been around for centuries and are found throughout the world today, help preserve the history of a community.
 - F. The public library is often used as a place for community leaders and organizers to host community events, such as hearings or town halls.
 - G. Libraries rely on a combination of local, state, and federal dollars to provide the kinds of services and programs that community members have come to expect.
 - H. At a public library, people can interact with others through a variety of programs, including teen book clubs, toddler story times, and senior-citizen exercise classes.
7. Which revision of sentence 12 best maintains the formal style established in the passage?
- A. The free resources available at the library can help people accomplish many tasks.
 - B. All the free materials you can get at the library can help you do many different tasks.
 - C. Everything that is free at the library can help people work on a lot of different things.
 - D. The free resources you can find at the library can help you do whatever you need to do.

8. Where should sentence 17 be moved in order to improve the organization of the fourth paragraph (sentences 13–17)?
- E. to the beginning of the paragraph (before sentence 13)
 - F. between sentences 13 and 14
 - G. between sentences 14 and 15
 - H. between sentences 15 and 16
9. Which concluding sentence should be added after sentence 19 to support the argument presented in the passage?
- A. Therefore, patrons of the public library can grow in both their social life and their level of community engagement.
 - B. Clearly, it is in the best interest of community members to maintain, support, and use their public library.
 - C. After all, the public library has been a part of American communities since the first library was founded in 1833.
 - D. In fact, community leaders must work together to find ways to generate more involvement in events at the public library.

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 before marking the best answer for each question. Base your answers only on the content within the text.

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The Tunguska Fireball

- 1 On June 30, 1908, an enormous fireball shot across the sky and exploded high above the remote Tunguska River Valley in the Siberian region of Russia. Twenty miles away, huts were flattened and people were flung into the air. Villagers 40 miles away felt the heat and heard explosions, and tremors were recorded at a German seismic station more than 3,000 miles away.
- 2 What caused the intense light and the horrendous destruction of the Tunguska Fireball, as it came to be called? Scientists and laypeople have debated the question for over 100 years. Not until 1927 did a scientific expedition, led by Russian scientist Leonid Kulik, reach the remote site. Kulik discovered a vast region of scorched and downed trees, their trunks pointing away from the center of the blast. Convinced that a meteorite was responsible, Kulik searched for evidence—a crater, a buried meteorite, even fragments of the exploded mass. He never found it.
- 3 Other scientists, amateur astronomers, and the public suggested alternative theories of what had happened. Some thought it was an earthquake. Perhaps, others said, a black hole—a theoretical object in space where gravity is so strong that even light cannot get out—had collided with Earth or an alien spaceship carrying nuclear material had crashed.
- 4 For many years Russian scientists believed that the Tunguska Fireball was a comet—a cluster of dust and frozen gases—that had exploded a few hundred feet above the ground. They pointed to the lack of meteoric evidence and the June 30 date, a time of year when Earth was passing through cometary debris. Other scientists disagreed, arguing that a comet would have burned quickly in Earth’s atmosphere and could not have created such a blast.
- 5 Many Western scientists believed that a meteorite was responsible, despite the lack of evidence. The pattern of fallen trees suggested that they were knocked down by a blast about 4 miles above the ground with an energy of 15 megatons of TNT, consistent with a meteoric blast. Yet repeated searches of the surrounding forest and wetlands revealed no evidence of a meteorite.
- 6 During the 1990s an Italian physicist named Menotti Galli became interested. Galli had previously investigated whether particles from outer space can add carbon atoms to the cellulose in trees. Perhaps the trees at the Tunguska site hid evidence of such extraterrestrial material. Galli and his colleagues traveled to the site by helicopter to gather core samples from spruce trees that had lived through the blast. They analyzed the particles trapped in the trees’ resin, and the results were remarkable. Based on studying the trees’ rings during the time period when the Tunguska Fireball occurred, the researchers found that the resin contained high levels of high-proton elements, such as copper, gold, and nickel. In fact, it contained ten times more such particles than resin dating from either before or after that time period. Some previously discovered meteorites had also contained elevated levels of these elements, suggesting that the particles had an extra-earthly origin. But then where is the crater? Is it nearby Lake Cheka, as some claim? Or was the meteorite reduced to dust in the atmosphere? Can scientists rule out a comet carrying those elements? The mystery remains unsolved.

10. What evidence best indicated the location of the blast?
- E. a lake formed from a crater
 - F. tremors recorded at a seismic station
 - G. damage caused to buildings
 - H. the position of the trunks of fallen trees
11. The June 30 date of the Tunguska event was significant to some scientists because it
- A. suggested that the explosion may have been caused by a comet.
 - B. highlighted why tree resin from the time of the blast contained high-proton elements.
 - C. indicated that the blast may have resulted from Earth's impact with a black hole.
 - D. explained why debris from outer space would have burned up in the atmosphere.
12. What did Galli's analysis of tree resin at the site reveal?
- E. Certain elements were unusually abundant around the time of the blast.
 - F. Particles from outer space can add carbon atoms to trees.
 - G. Spruce trees were able to survive the Tunguska explosion.
 - H. Meteorites are composed of gold, copper, and other high-proton elements.
13. Based on the passage, what is the most likely reason it took nineteen years from the date of the explosion before scientists first visited the Tunguska site?
- A. The scientists feared radioactivity from a nuclear explosion.
 - B. The site was far from civilization and difficult to reach.
 - C. Scientists hoped to establish a cause before exploring the site.
 - D. Craters from the explosion hampered travel to the area.

14. What is the primary role of paragraph 1 in the structure of the passage?
- E. It explains the scientific importance of the explosion.
 - F. It indicates the magnitude of the explosion.
 - G. It provides possible causes of the explosion.
 - H. It describes the human suffering caused by the explosion.
15. The author includes a series of questions at the end of the last paragraph most likely to
- A. encourage further study of the Tunguska event.
 - B. suggest that the Tunguska event had multiple causes.
 - C. reflect a personal curiosity about the Tunguska event.
 - D. emphasize that the Tunguska event has not yet been fully explained.

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Excerpt from *A Voice in the Wilderness*

by Grace Livingston Hill

- 1 With a lurch the train came to a dead stop and Margaret Earle, hastily gathering up her belongings, hurried down the aisle and got out into the night.
- 2 It occurred to her, as she swung her heavy suit-case down the rather long step to the ground, and then carefully swung herself after it, that it was strange that neither conductor, brakeman, nor porter had come to help her off the train, when all three had taken the trouble to tell her that hers was the next station; but she could hear voices up ahead. Perhaps something was the matter with the engine that detained them and they had forgotten her for the moment.
- 3 The ground was rough where she stood, and there seemed no sign of a platform. Did they not have platforms in this wild Western land, or was the train so long that her car had stopped before reaching it?
- 4 She strained her eyes into the darkness, and tried to make out things from the two or three specks of light that danced about like fireflies in the distance. She could dimly see moving figures away up near the engine, and each one evidently carried a lantern. The train was tremendously long. A sudden feeling of isolation took possession of her. Perhaps she ought not to have got out until some one came to help her. Perhaps the train had not pulled into the station yet and she ought to get back on it and wait. Yet if the train started before she found the conductor she might be carried on somewhere and he justly blame her for a fool.
- 5 There did not seem to be any building on that side of the track. It was probably on the other, but she was standing too near the cars to see over. She tried to move back to look, but the ground sloped and she slipped and fell in the cinders,¹ bruising her knee and cutting her wrist.
- 6 In sudden panic she arose. She would get back into the train, no matter what the consequences. They had no right to put her out here, away off from the station, at night, in a strange country. If the train started before she could find the conductor she would tell him that he must back it up again and let her off. He certainly could not expect her to get out like this.
- 7 She lifted the heavy suit-case up the high step that was even farther from the ground than it had been when she came down, because her fall had loosened some of the earth and caused it to slide away from the track. Then, reaching to the rail of the step, she tried to pull herself up, but as she did so the engine gave a long snort and the whole train, as if it were in league against her, lurched forward crazily, shaking off her hold. She slipped to her knees again, the suit-case, toppled from the lower step, descending upon her, and together they slid and rolled down the short bank, while the train . . . ran giddily off into the night.
- 8 The horror of being deserted helped the girl to rise in spite of bruises and shock. She lifted imploring hands to the unresponsive cars as they hurried by her—one, two, three, with bright windows, each showing a passenger, comfortable and safe inside, unconscious of her need.

¹**cinders:** track bed made from the residue of burnt coal

- 9 A moment of useless screaming, running, trying to attract some one’s attention, a sickening sense of terror and failure, and the last car slatted itself past with a mocking clatter, as if it enjoyed her discomfort.
- 10 Margaret stood dazed, reaching out helpless hands, then dropped them at her sides and gazed after the fast-retreating train, the light on its last car swinging tauntingly, blinking now and then with a leer in its eye, rapidly vanishing from her sight into the depth of the night.
- 11 She gasped and looked about her for the station that but a short moment before had been so real to her mind; and, lo! on this side and on that there was none!
- 12 The night was wide like a great floor shut in by a low, vast dome of curving blue set with the largest, most wonderful stars she had ever seen. Heavy shadows of purple-green, smoke-like, hovered over earth darker and more intense than the unfathomable blue of the night sky. It seemed like the secret nesting-place of mysteries wherein no human foot might dare intrude. It was incredible that such could be but common sage-brush, sand, and greasewood wrapped about with the beauty of the lonely night.
- 13 No building broke the inky outlines of the plain, nor friendly light streamed out to cheer her heart. Not even a tree was in sight, except on the far horizon, where a heavy line of deeper darkness might mean a forest. Nothing, absolutely nothing, in the blue, deep, starry dome above and the bluer darkness of the earth below save one sharp shaft ahead like a black mast throwing out a dark arm across the track.
- 14 As soon as she sighted it she picked up her baggage and made her painful way toward it, for her knees and wrist were bruised and her baggage was heavy.
- 15 A soft drip, drip greeted her as she drew nearer; something plashing down among the cinders by the track. Then she saw the tall column with its arm outstretched, and looming darker among the sage-brush the outlines of a water-tank. It was so she recognized the engine’s drinking-tank, and knew that she had mistaken a pause to water the engine for a regular stop at a station.

From A VOICE IN THE WILDERNESS by Grace Livingston Hill—Public Domain

16. In paragraph 2, how does the phrase “when all three had taken the trouble to tell her” affect the tone in the first part of the excerpt?
- E. It creates an accusatory tone by suggesting that Margaret believes that others are responsible for her problem.
 - F. It introduces a defiant tone by suggesting that Margaret left the train early to prove a point.
 - G. It suggests a frustrated tone by showing that Margaret feels confused by the inconsistent help offered by the railroad employees.
 - H. It establishes an appreciative tone by showing that Margaret feels cared for by the railroad employees.

17. Which sentence from the excerpt best supports the idea that traveling to new places by train is unfamiliar to Margaret?
- A. “With a lurch the train came to a dead stop and Margaret Earle, hastily gathering up her belongings, hurried down the aisle and got out into the night.” (paragraph 1)
 - B. “Perhaps something was the matter with the engine that detained them and they had forgotten her for the moment.” (paragraph 2)
 - C. “Did they not have platforms in this wild Western land, or was the train so long that her car had stopped before reaching it?” (paragraph 3)
 - D. “She could dimly see moving figures away up near the engine, and each one evidently carried a lantern.” (paragraph 4)

18. Read this sentence from paragraph 4.

Yet if the train started before she found the conductor she might be carried on somewhere and he justly blame her for a fool.

How does the sentence contribute to the development of the plot?

- E. It shows how Margaret’s reliance on the guidance of others leads to the external conflict she faces.
 - F. It reveals how Margaret’s concern about the opinions of others causes the external conflict she faces.
 - G. It highlights how Margaret’s indecision results in the external conflict being prolonged.
 - H. It illustrates how Margaret’s confusion makes it difficult for her to fully understand the external conflict.
19. Read this sentence from paragraph 4.

She strained her eyes into the darkness, and tried to make out things from the two or three specks of light that danced about like fireflies in the distance.

The simile used in the sentence affects the tone of the paragraph by emphasizing a

- A. feeling of comfort as Margaret connects her unfamiliar surroundings with familiar images.
- B. sense of lonesomeness as Margaret realizes that she is on her own in the wilderness.
- C. sense of tranquility as Margaret is distracted from the urgency of her situation by the beauty of the night.
- D. feeling of dread as Margaret regards the desolation of the land that surrounds her.

20. Read paragraph 9 from the excerpt.

A moment of useless screaming, running, trying to attract some one's attention, a sickening sense of terror and failure, and the last car slatted itself past with a mocking clatter, as if it enjoyed her discomfort.

The imagery in this sentence conveys the

- E. growing irritation Margaret feels as she is ignored by people on the train.
- F. effort Margaret is making despite being physically unable to keep up with the train.
- G. anger that Margaret is experiencing as she watches the train leave without her.
- H. vulnerability Margaret feels as the train leaves her behind.

21. How does Margaret's experience in paragraph 9 emphasize a theme of the excerpt?

- A. It confirms Margaret's understanding that she cannot rely on help from anyone else.
- B. It leads Margaret to realize that her efforts to change her situation are ineffective.
- C. It causes Margaret to believe that her own actions led to an unfavorable outcome.
- D. It reinforces Margaret's frustration about her lack of control over her surroundings.

22. Read paragraph 10 from the excerpt.

Margaret stood dazed, reaching out helpless hands, then dropped them at her sides and gazed after the fast-retreating train, the light on its last car swinging tauntingly, blinking now and then with a leer in its eye, rapidly vanishing from her sight into the depth of the night.

What does the figurative language in this sentence emphasize?

- E. the sense of doubt that Margaret experiences when she is deciding what to do next
- F. the anger that Margaret feels toward the people on the train who she expected to help her
- G. the embarrassment that Margaret feels when she imagines what others will think of her
- H. the hopelessness that Margaret feels when she accepts that the train is continuing on

- 23.** How does paragraph 11 contribute to the plot of the excerpt?
- A.** It reveals that the reality of the situation is different from Margaret’s assumptions.
 - B.** It illustrates that Margaret’s main problem is her own imagination.
 - C.** It shows that Margaret is surprised by the unexpected adventure she is about to undertake.
 - D.** It provides additional insight into how Margaret reacts to stressful situations.
- 24.** How do the details in paragraphs 12–13 about the setting help support the theme of the excerpt?
- E.** They show that Margaret is overwhelmed by the darkness that surrounds her.
 - F.** They suggest that the situation is frustrating but that Margaret is hopeful.
 - G.** They reveal that the landscape is beautiful and that Margaret is alone.
 - H.** They demonstrate that Margaret is easily discouraged and frightened.

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Excerpt from “Niagara Falls”

by Rupert Brooke

- 1 The real secret of the beauty and terror of the Falls is not their height or width, but the feeling of colossal power and of unintelligible disaster caused by the plunge of that vast body of water. If that were taken away, there would be little visible change, but the heart would be gone.
- 2 The American Falls do not inspire this feeling in the same way as the Canadian. It is because they are less in volume, and because the water does not fall so much into one place. By comparison their beauty is almost delicate and fragile. They are extraordinarily level, one long curtain of lacework and woven foam. Seen from opposite, when the sun is on them, they are blindingly white, and the clouds of spray show dark against them. With both Falls the colour of the water is the ever-altering wonder. Greens and blues, purples and whites, melt into one another, fade, and come again, and change with the changing sun. Sometimes they are as richly diaphanous¹ as a precious stone, and glow from within with a deep, inexplicable light. Sometimes the white intricacies of dropping foam become opaque and creamy. And always there are the rainbows. If you come suddenly upon the Falls from above, a great double rainbow, very vivid, spanning the extent of spray from top to bottom, is the first thing you see. If you wander along the cliff opposite, a bow springs into being in the American Falls, accompanies you courteously on your walk, dwindles and dies as the mist ends, and awakens again as you reach the Canadian tumult. And the bold traveller who attempts the trip under the American Falls sees, when he dare open his eyes to anything, tiny baby rainbows, some four or five yards in span, leaping from rock to rock among the foam, and gambolling beside him, barely out of hand’s reach, as he goes. One I saw in that place was a complete circle, such as I have never seen before, and so near that I could put my foot on it. It is a terrifying journey, beneath and behind the Falls. The senses are battered and bewildered by the thunder of the water and the assault of wind and spray; or rather, the sound is not of falling water, but merely of falling; a noise of unspecified ruin. So, if you are close behind the endless clamour, the sight cannot recognise liquid in the masses that hurl past. You are dimly and pitifully aware that sheets of light and darkness are falling in great curves in front of you. Dull omnipresent foam washes the face. Farther away, in the roar and hissing, clouds of spray seem literally to slide down some invisible plane of air.
- 3 Beyond the foot of the Falls the river is like a slipping floor of marble, green with veins of dirty white, made by the scum that was foam. It slides very quietly and slowly down for a mile or two, sullenly exhausted. Then it turns to a dull sage green, and hurries more swiftly, smooth and ominous. As the walls of the ravine close in, trouble stirs, and the waters boil and eddy. These are the lower rapids, a sight more terrifying than the Falls, because less intelligible. Close in its bands of rock the river surges tumultuously forward, writhing and leaping as if inspired by a demon. It is pressed by the straits into a visibly convex form. Great planes of water slide past. Sometimes it is thrown up into a pinnacle of foam higher than a house, or leaps with incredible speed from the crest of one vast wave to another, along the shining curve between, like the spring of a wild beast. Its motion continually suggests muscular action. The power manifest in these rapids moves one with a different sense of awe and terror from that of the Falls. Here the inhuman life and strength are spontaneous, active, almost resolute. . . . A place of fear.

¹**diaphanous:** sheer, translucent

4 One is drawn back, strangely, to a contemplation of the Falls, at every hour, and especially by night, when the cloud of spray becomes an immense visible ghost, straining and wavering high above the river, white and pathetic and translucent. The Victorian lies very close below the surface in every man. There one can sit and let great cloudy thoughts of destiny and the passage of empires drift through the mind; for such dreams are at home by Niagara. I could not get out of my mind the thought of a friend, who said that the rainbows over the Falls were like the arts and beauty and goodness, with regard to the stream of life—caused by it, thrown upon its spray, but unable to stay or direct or affect it, and ceasing when it ceased. In all comparisons that rise in the heart, the river, with its multitudinous waves and its single current, likens itself to a life, whether of an individual or of a community. A man’s life is of many flashing moments, and yet one stream; a nation’s flows through all its citizens, and yet is more than they. In such places, one is aware, with an almost insupportable and yet comforting certitude, that both men and nations are hurried onwards to their ruin or ending as inevitably as this dark flood. Some go down to it unreluctant, and meet it, like the river, not without nobility. And as incessant, as inevitable, and as unavailing as the spray that hangs over the Falls, is the white cloud of human crying. . . . With some such thoughts does the platitudinous² heart win from the confusion and thunder of a Niagara peace that the quietest plains or most stable hills can never give.

From LETTERS FROM AMERICA by Rupert Brooke—Public Domain

²**platitudinous:** clichéd, common

25. The central idea that the Falls communicate a feeling of “unintelligible disaster” (paragraph 1) is conveyed in paragraph 2 through a description of

- A. the glow of the precious stones visible within the water.
- B. the dynamic flow of the colors that are visible in the water.
- C. the sudden appearance and disappearance of rainbows.
- D. the sounds associated with a sense of falling.

26. Read this sentence from paragraph 2.

They are extraordinarily level, one long curtain of lacework and woven foam.

What is the effect of comparing the American Falls to a “long curtain of lacework and woven foam”?

- E. It demonstrates the timelessness of the American Falls.
- F. It conveys the secretive nature of the American Falls.
- G. It illustrates the elegant uniformity of the American Falls.
- H. It communicates the intense strength of the American Falls.

27. Read this sentence from paragraph 3.

These are the lower rapids, a sight more terrifying than the Falls, because less intelligible.

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

- A. It signals a change from the positive aspects of the Falls to the negative aspects.
- B. It indicates a progression from the literal description of the water to a discussion of timeless truths.
- C. It highlights a shift from the qualities of the Falls to the qualities of the river.
- D. It introduces a contrast between the obvious and the hidden features of the rapids.

28. Which sentence from the excerpt best supports the idea that the essence of the Falls lies in their emotional impact?

- E. “If that were taken away, there would be little visible change, but the heart would be gone.” (paragraph 1)
- F. “By comparison their beauty is almost delicate and fragile.” (paragraph 2)
- G. “One is drawn back, strangely, to a contemplation of the Falls, at every hour, and especially by night, when the cloud of spray becomes an immense visible ghost, straining and wavering high above the river, white and pathetic and translucent.” (paragraph 4)
- H. “A man’s life is of many flashing moments, and yet one stream; a nation’s flows through all its citizens, and yet is more than they.” (paragraph 4)

29. Read this sentence from paragraph 4.

There one can sit and let great cloudy thoughts of destiny and the passage of empires drift through the mind; for such dreams are at home by Niagara.

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

- A. suggesting that viewing the Falls can be a life-changing experience.
- B. showing that the cliffs of the Falls are a good place for self-examination.
- C. emphasizing that the grandeur of the Falls seems impossible to grasp.
- D. highlighting the type of reflection that is inspired by a visit to the Falls.

- 30.** In paragraph 4, the idea that human life and history travel toward the same ending is illustrated mainly through
- E.** the discussion of how the rainbows visible in the Falls are like the art and beauty created by humankind.
 - F.** the comparison between the movement of water in the Falls and the human experience.
 - G.** the inclusion of details that show that every observer’s experience with the Falls is different.
 - H.** the acknowledgment that contemplating the Falls at night sparks an awareness of humankind’s destiny.
- 31.** With which statement would the author of this excerpt most likely agree?
- A.** A sense of ease and assurance comes with accepting one’s fate.
 - B.** No matter where one’s path goes in life, one will always have regrets.
 - C.** The best way to overcome fear is to recognize it and then defy it.
 - D.** Reason will die out with humanity, but art will remain immortal.

Uncovering the Past

- 1 Archaeology as a distinct branch of science is only about two centuries old. The first archaeological activities focused largely on the search for clues about earlier human societies. In the nineteenth century, most archaeologists were amateurs trained in ancient languages and history. Many were art historians whose interest lay in the artwork and monuments of ancient civilizations. For the most part, their excavations were aimed at uncovering and removing priceless artwork and other valuable artifacts for museum display. Collectively, these early archaeologists are now considered traditional archaeologists.
- 2 Today, however, there is a different approach to archaeology, one that tries to reconstruct the everyday life of people in ancient times by applying the scientific methods of a range of specialized fields. Modern archaeologists take full advantage of available technology. Laptop computers enable digging teams to record their finds at each level of an excavation. With sketchpad computer software, archaeologists can draw their finds in the field. Three-dimensional computer modeling enables researchers to create floor plans and elevations for the structures they uncover. Archaeologists can also use remote sensing technologies such as radar and lidar, which is similar to radar but it uses laser light instead of radio waves. These technologies enable scientists to detect traces of early settlements that are not visible to the human eye.
- 3 The excavations at Kourion, a Roman port city on the island of Cyprus in the Mediterranean Sea, serve as an example of the modern approach. Portions of Kourion had been unexpectedly buried by a massive earthquake in the fourth century A.D. Traditional archaeologists were interested primarily in the remains of Kourion's theater, temple, and classical monuments. They also collected precious objects, such as jewelry, found in nearby tombs. Modern archaeologists, however, have focused their studies and excavations on the settlement itself. This preserved seaport has proved to be a gold mine of important information about everyday life sixteen centuries ago.
- 4 During one excavation of a house at Kourion, for example, forensic anthropologists were able to reconstruct the skeleton of a young girl, whom they called Camelia. On the basis of her teeth, they determined her age to be about thirteen, although measurement of her skeleton showed that she was only the size of a modern eleven-year-old. The study of the teeth also confirmed her sex and pointed to her excellent health; Camelia had no cavities. Even after centuries, the forensic scientists could study the physical evidence in ways similar to those used in criminal investigations to determine the circumstances of Camelia's death.
- 5 Other specialists on this excavation included a zooarchaeologist, who identified animal remains, including the skeleton of a mule found near Camelia. Another specialist, a paleobotanist, studied the contents of a bake oven at the site and identified four domesticated grains among the charred crumbs—evidence of a kind of ancient multigrain bread.
- 6 Although the archaeologists at this site unearthed a few beautiful items, the excavation did not uncover any priceless artwork for museums. Nonetheless, the archaeological processes used in Kourion have given us a valuable insight into everyday life in a Roman city.

- 32.** Which of the following best describes the goal of modern archaeology?
- E.** to use science to learn how people lived in the past
 - F.** to find artwork from ancient civilizations
 - G.** to search for evidence of ancient settlements
 - H.** to uncover precious objects for display in museums
- 33.** What would a traditional archaeologist be most interested in finding at a site like Kourion?
- A.** a human skeleton
 - B.** beautiful jewelry or ceramics
 - C.** evidence of foods eaten
 - D.** the remains of animals
- 34.** What role does paragraph 2 play in the structure of the passage?
- E.** It provides a contrast to the topic discussed in the first paragraph.
 - F.** It details examples that support the central idea of the first paragraph.
 - G.** It states a theory that will be explained further in the third paragraph.
 - H.** It summarizes the information found in the rest of the passage.
- 35.** Which conclusion is best supported by the information in paragraph 4?
- A.** Forensic anthropologists specialize in the excavation of ancient theaters and temples.
 - B.** Forensic anthropologists can obtain a variety of information by examining teeth.
 - C.** Forensic anthropologists believe that people in the past were smaller than people are today.
 - D.** Forensic anthropologists primarily investigate ancient crimes.

- 36.** As described in paragraphs 4–5, what did the archaeological team learn about life in Kourion?
- E.** People in Kourion had a better diet than people have today.
 - F.** People in Kourion kept a wide variety of domesticated animals.
 - G.** People in Kourion had a shorter life expectancy than people have today.
 - H.** People in Kourion made bread from various domesticated grains.
- 37.** What is the most likely reason the author mentions the zooarchaeologist (paragraph 5)?
- A.** to introduce the topic of other artifacts discovered near Camelia
 - B.** to contrast this position with that of the paleobotanist
 - C.** to complete the list of archaeological specialists
 - D.** to provide an example of a particular field in modern archaeology

CONTINUE ON TO THE NEXT PAGE ►

Snowy Mountains

by John Gould Fletcher

Higher and still more high,
Palaces made for cloud,
Above the dingy city-roofs
Blue-white like angels with broad wings,
5 Pillars of the sky at rest
The mountains from the great plateau
Uprise.

But the world heeds them not;
They have been here now for too long a time.
10 The world makes war on them,
Tunnels their granite cliffs,
Splits down their shining sides,
Plasters their cliffs with soap-advertisements,
Destroys the lonely fragments of their peace.

15 Vaster and still more vast,
Peak after peak, pile after pile,
Wilderness still untamed,
To which the future is as was the past,
Barrier spread by Gods,
20 Sunning their shining foreheads,
Barrier broken down by those who do not need
The joy of time-resisting storm-worn stone,
The mountains swing along
The south horizon of the sky;
25 Welcoming with wide floors of blue-green ice
The mists that dance and drive before the sun.

“Snowy Mountains” by John Gould Fletcher—Public Domain

38. The description in the first stanza (lines 1–7) helps establish a central idea of the poem by
- E. comparing the length of time the mountains have existed with the length of time the city has existed.
 - F. contrasting the grandeur of the mountains with the structures in the city below them.
 - G. implying that the mountains are a source of inspiration to the people in the city below.
 - H. suggesting that the mountains are larger than the people in the city realize.

39. Read line 1 and line 15 from the poem.

Higher and still more high,

Vaster and still more vast,

The parallel structure of the two lines

- A. emphasizes how the sense of wonder the speaker has at the beginning of the poem changes to a fear of the mountains.
- B. reinforces the sense of awe the speaker experiences when considering the magnificence of the expansive mountains.
- C. reveals that the mountains are continually expanding both in height and land mass.
- D. stresses a contrast between the height of the mountains and the area of land the mountains cover.

40. Read line 5 from the poem.

Pillars of the sky at rest

The line helps develop the theme of the poem by suggesting that the mountains

- E. serve a noble and supportive purpose in the world.
- F. attract the clouds with their strength and permanence.
- G. remain untamed through the ages.
- H. provide protection for the people.

41. How does isolating the word “Uprise” in line 7 affect the meaning of the poem?

- A. It creates a contrast between the great plateau and the city buildings.
- B. It reveals the similarity between the tall buildings in the city and the tall mountains on the horizon.
- C. It creates a vision of the region before people developed the land.
- D. It emphasizes that the mountains dominate the landscape.

42. How does the poet develop the speaker's point of view in the second stanza (lines 8–14)?
- E. by describing images of the mountains' awe-inspiring size and strength
 - F. by illustrating the differences among the various ways humans can impact the natural environment
 - G. by criticizing society for taking careless, destructive courses of action against nature
 - H. by demonstrating how the mountains and the people are able to benefit from each other
43. Which line from the poem best supports the idea that people have forfeited priceless natural beauty in order to make a profit?
- A. "Above the dingy city-roofs" (line 3)
 - B. "The world makes war on them," (line 10)
 - C. "Tunnels their granite cliffs," (line 11)
 - D. "Plasters their cliffs with soap-advertisements," (line 13)
44. Which detail from the poem reflects the speaker's view that people often fail to appreciate what is familiar?
- E. "The mountains from the great plateau" (line 6)
 - F. "They have been here now for too long a time." (line 9)
 - G. "Splits down their shining sides," (line 12)
 - H. "To which the future is as was the past," (line 18)
45. How do the details in the third stanza (lines 15–26) contribute to the development of the theme of the poem?
- A. by reflecting nature's capacity to resist change
 - B. by showing that nature is capable of influencing human will
 - C. by exposing how a lack of awareness leads to nature's ruin
 - D. by explaining why people must respect nature

46. Read lines 21–22 from the poem.

**Barrier broken down by those who do not need
The joy of time-resisting storm-worn stone,**

How do the lines help convey the speaker’s point of view?

- E. They suggest that the speaker wants to remove the obstacles that prevent others from experiencing the wonders of nature.
- F. They reveal the speaker’s opinion that some people are too busy to appreciate natural beauty.
- G. They suggest the speaker’s dismay that people destroy the natural landscape without understanding the ramifications of their actions.
- H. They explain that the speaker is confident that nature will never be fully destroyed by people.

47. Read lines 23–26 from the poem.

**The mountains swing along
The south horizon of the sky;
Welcoming with wide floors of blue-green ice
The mists that dance and drive before the sun.**

The personification in these concluding lines of the poem suggests that the mountains are

- A. gracious hosts who are untroubled by the actions of people.
- B. unaware of their coming destruction.
- C. lively entertainers who are not bothered by the everyday concerns of people.
- D. too proud to reveal their pain.

Samuel Morse, an American inventor, is credited with creating the electronic telegraph, a communication device that allows users to send messages using a system of short and long pulses that represent letters, numbers, and punctuation. In 1844 the United States Congress passed the Telegraph Bill, which provided Morse with the funds to build an electric telegraph system.

Invention of the Telegraph

Earlier Signal Systems

- 1 Long before Samuel F. B. Morse electrically transmitted his famous message “What hath God wrought?” from Washington to Baltimore on May 24, 1844, there were signaling systems that enabled people to communicate over distances. Most were visual or “semaphore” systems using flags or lights. In the eighteenth century, such systems used an observer who would decipher a signal from a high tower on a distant hill and then send it on to the next station. The young American republic wanted just such a system along its entire Atlantic coast and offered a prize of \$30,000 for a workable proposal. The framers of this legislation¹ had no way of knowing that when they used the word “telegraph” to refer to this visual semaphore system, they would be offered an entirely new and revolutionary means of communication—electricity.

The Growth of an Idea

- 2 The idea of using electricity to communicate over distance is said to have occurred to Morse during a conversation aboard ship when he was returning from Europe in 1832. Michael Faraday’s recently invented electromagnet was much discussed by the ship’s passengers, and when Morse came to understand how it worked, he speculated that it might be possible to send a coded message over a wire. While a student at Yale College years before, he had written his parents a letter about how interesting he found the lectures on electricity. Despite what he had learned at Yale, Morse found when he began to develop his idea that he had little real understanding of the nature of electricity, and after sporadic attempts to work with batteries, magnets, and wires, he finally turned for help to a colleague at the University of the City of New York, Leonard D. Gale.
- 3 Gale was a professor of chemistry and familiar with the electrical work of Princeton’s Joseph Henry, a true pioneer in the new field. Well before Morse had his shipboard idea about a telegraph, Henry rang a bell at a distance by opening and closing an electric circuit. In 1831, he had published an article, of which Morse was unaware, that contained details suggesting the idea of an electric telegraph. Gale’s help and his knowledge of this article proved crucial to Morse’s telegraph system because Gale not only pointed out flaws in the system but showed Morse how he could regularly boost the strength of a signal and overcome the distance problems he had encountered by using a relay system Henry had invented. Henry’s experiments, Gale’s assistance, and, soon after, hiring the young technician Alfred Vail were keys to Morse’s success.

Obstacles and Opportunities

- 4 By December 1837, Morse had enough confidence in his new system to apply for the federal government’s appropriation, and during the next year he conducted demonstrations of his telegraph both in New York and Washington.

¹**legislation:** Telegraph Bill

- 5 However, when the economic disaster known as the Panic of 1837 took hold of the nation and caused a long depression, Morse was forced to wait for better times. It was during this period that Morse visited Europe again and tried not only to secure patent protection overseas but to examine competing telegraph systems in England. . . .
- 6 By 1843, the country was beginning to recover economically, and Morse again asked Congress for the \$30,000 that would allow him to build a telegraph line from Washington to Baltimore, forty miles away. The House of Representatives eventually passed the bill containing the Morse appropriation, and the Senate approved it in the final hours of that Congress’s last session. With President Tyler’s signature, Morse received the cash he needed and began to carry out plans for an underground telegraph line.

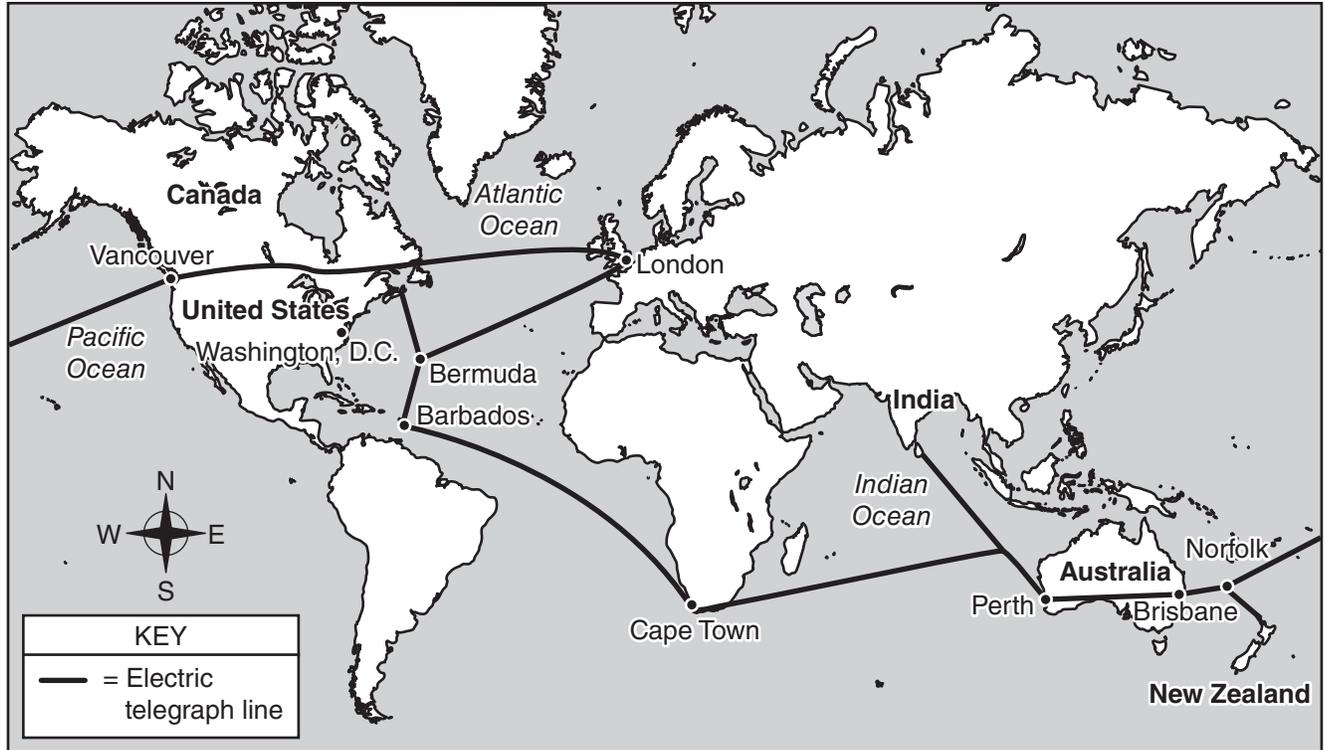
Realizing a Great Invention

- 7 Morse had hired the ingenious construction engineer Ezra Cornell to lay the pipe carrying the wire, and although Cornell did his job superbly, one of Morse’s partners, Congressman F. O. J. Smith, had purchased wire with defective insulation. Too much time had been wasted laying bad wire, and with the project on a rigid deadline, something had to be done quickly. Cornell suggested that the fastest and cheapest way of connecting Washington and Baltimore was to string wires overhead on trees and poles. The desperate Morse gave the go-ahead, and the line was completed in time for the dramatic and spectacularly successful link between the Supreme Court chamber of the Capitol building and the railroad station in Baltimore.
- 8 Soon, as overhead wires connected cities up and down the Atlantic coast, the dots-and-dashes method² that recorded messages on a long moving strip of paper was replaced by the operator’s ability to interpret the code in real time. . . . Telegraph lines soon extended westward, and within Morse’s own lifetime they connected the continents of Europe and America.

“Invention of the Telegraph”—Public Domain/Library of Congress

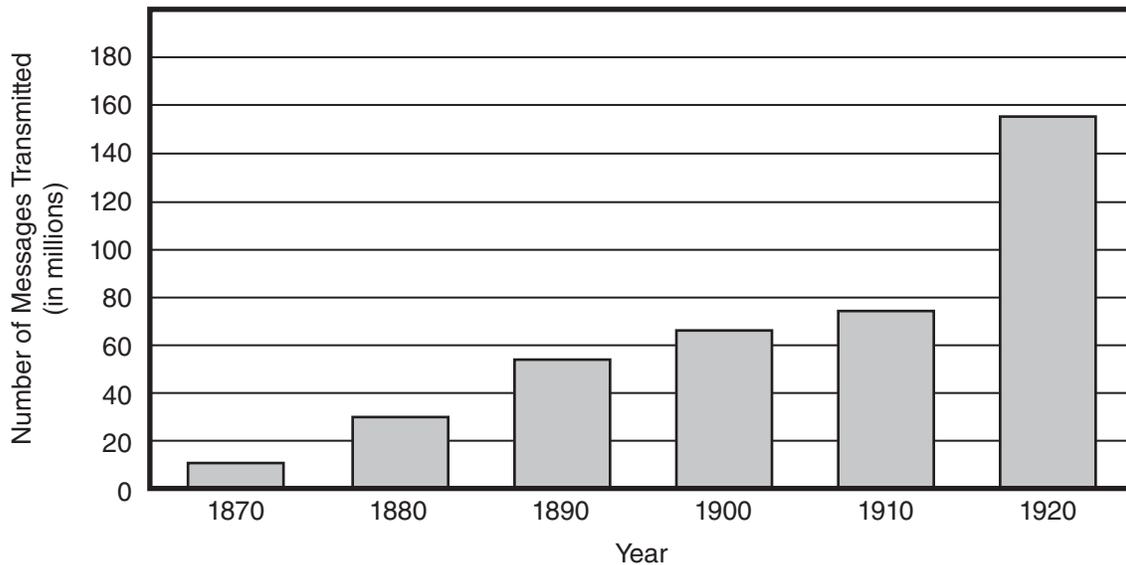
²**dots-and-dashes method:** the short and long pulses of Morse code that are sent and received by telegraph operators

BRITISH ALL-RED TELEGRAPH LINE, 1902



The first transatlantic electric telegraph message was sent in 1858, and by 1902 the British All-Red Line connected most of the world.

TELEGRAPH MESSAGES TRANSMITTED, 1870–1920



Source: U.S. Bureau of the Census. *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 2. Washington, D.C., 1975.*

48. Which statement describes how the author’s use of problem-solution in paragraph 2 contributes to the development of ideas in the passage?
- E. Morse’s discussion on a ship about Faraday’s electromagnet reminded him of the Yale College lectures on electricity, which he had enjoyed but had not fully understood, inspiring him to learn more about electricity from his colleague Gale.
 - F. Morse’s discouragement over his lack of knowledge of electricity prompted him to experiment with batteries, magnets, and wires, which led to the development of a new long-distance communication system.
 - G. Morse’s difficulty in understanding how Faraday’s electromagnet worked was frustrating, and it pushed him to create a system for sending signals over wires.
 - H. Morse’s longtime fascination was not enough to make up for his lack of knowledge about electricity, so he eventually sought help from Gale.
49. Which statement describes how the author’s use of sequencing in paragraph 3 contributes to the overall structure of the passage?
- A. It shows that several people were simultaneously attempting to create an electric telegraph.
 - B. It shows how the invention of the electric telegraph depended on information and techniques discovered by others.
 - C. It shows that multiple means of long-distance communication were being used at the same time.
 - D. It shows how quickly long-distance communication changed from visual signals to electrical signals.
50. Read this sentence from paragraph 7.

The desperate Morse gave the go-ahead, and the line was completed in time for the dramatic and spectacularly successful link between the Supreme Court chamber of the Capitol building and the railroad station in Baltimore.

The words “dramatic” and “spectacularly” in the sentence convey a

- E. sense of relief and fulfillment that the line was finished.
- F. sense of wonder and of celebration that the telegraph line was completed on time.
- G. feeling of excitement about the future possibilities of the telegraph.
- H. feeling of confidence about being able to continue the work.

51. Which excerpt from the passage supports the idea that Morse was aware of his limitations?
- A. “After sporadic attempts to work with batteries, magnets, and wires, he finally turned for help to a colleague.” (paragraph 2)
 - B. “Gale’s help and his knowledge of this article proved crucial to Morse’s telegraph system.” (paragraph 3)
 - C. “Henry’s experiments, Gale’s assistance, and, soon after, hiring the young technician Alfred Vail were keys to Morse’s success.” (paragraph 3)
 - D. “Morse had hired the ingenious construction engineer Ezra Cornell to lay the pipe carrying the wire.” (paragraph 7)
52. The details of the section “The Growth of an Idea” convey a central idea of the passage by suggesting that
- E. the collaborative efforts of colleagues resulted in successful communication over a wire.
 - F. a great deal of interest and work was devoted to understanding how to use electricity to send signals.
 - G. Faraday’s invention of the electromagnet inspired the invention of the telegraph.
 - H. colleges like Yale played a great role in making new discoveries about electricity and its applications.
53. How does the graph support the ideas in paragraph 8?
- A. It indicates how welcome the improvement of long-distance communication was in the United States.
 - B. It provides evidence of the dramatic increase in the number of telegraph messages as Morse’s system expanded across the United States.
 - C. It reveals that by the twentieth century millions of people had used the telegraph despite earlier hesitations about the system.
 - D. It shows how improvements that allowed Morse code to be read in real time made relaying telegraph messages faster and increased the system’s usage.

54. Which sentence is the best summary of how Morse obtained the funding necessary to build his telegraph system?
- E. Morse applied for a federal grant that was delayed until 1843, so he spent time traveling in Europe, where he concentrated on obtaining a patent for his system.
 - F. Morse applied for a government grant that required both houses of Congress and the president to pass a bill awarding him \$30,000 for his telegraph project.
 - G. Morse applied for a government appropriation and conducted telegraph demonstrations to show that his system could work, and after a delay caused by a financial depression, Congress approved the \$30,000 appropriation in 1843.
 - H. Working with Gale and Vail allowed Morse to find flaws in Henry's work and to develop his own ideas before applying for the federal government appropriation.
55. How does the map provide additional support for a central idea of the passage?
- A. by demonstrating that Morse's telegraph system greatly exceeded the limitations of previous long-distance communication systems
 - B. by indicating that Morse was lacking foresight by seeking a patent only in North America
 - C. by proving that Gale's advice helped Morse extend the telegraph's range much farther than first thought possible
 - D. by providing a graphic that shows the surprisingly immense influence Morse's telegraph had across the world
56. The idea that, in the mid-nineteenth century, the United States was mostly unaware of the possibilities of electricity is illustrated in the passage mainly through the
- E. description of the government's initial desire to expand a semaphore signaling system that used either flags or lights along the Atlantic Coast.
 - F. delay by the House of Representatives to pass the bill funding Morse's telegraph line six years after he first applied for the appropriation.
 - G. discussions of the newly invented electromagnet that sparked the idea of sending codes through wires.
 - H. description of how an electric circuit could be closed to ring a bell at a distance.
57. With which statement would the author most likely agree?
- A. Morse's telegraph was successful because the wires were strung aboveground rather than underground as originally planned.
 - B. Understanding the importance of Morse's telegraph requires detailed knowledge of electrical systems.
 - C. The implementation of Morse's telegraph system was overly influenced by economic factors.
 - D. Morse's invention of the telegraph made a great stride toward better connecting people across the United States and across the world.

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 figured out 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, (on a graph) lines that appear to be parallel can be assumed to be parallel; likewise 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.**

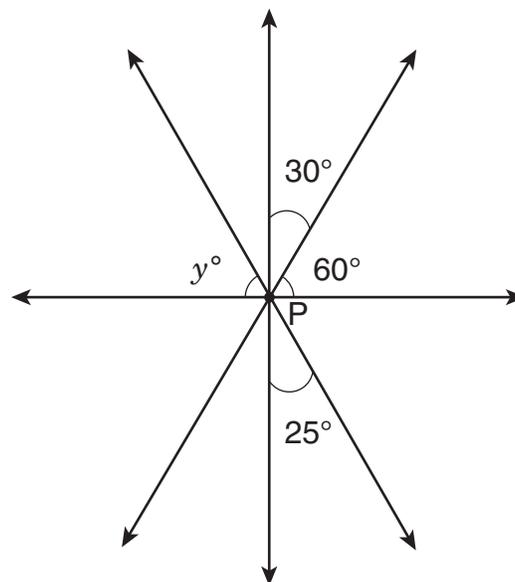
58. How many 5-digit numbers can be created using the digits 2, 3, 5, 7, and 8 without repeating any digits within that 5-digit number?

61. Tyler has completed 60 pages in his French workbook. This is 20% of the total number of pages in the workbook. How many pages are in the workbook?

59.
$$\frac{147-x}{12} = 12$$
What is the value of x in the equation shown above?

62.

60. $|(-6) - (-5) + 4.2| - |3 - 9.6| =$



Four straight lines intersect at point P as shown above. What is the value of y ?

MULTIPLE CHOICE QUESTIONS

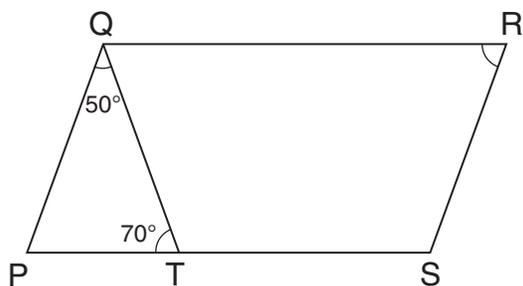
QUESTIONS 63–114

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. If $x = 9$ and $y = -7$, what is the value of $x(x - 2y)$?

A. 18
B. 45
C. 144
D. 207

- 64.



In the figure above, PQRS is a parallelogram. The measure of $\angle PQT$ is 50° , and the measure of $\angle PTQ$ is 70° . What is the measure of $\angle QRS$?

E. 60°
F. 70°
G. 80°
H. 120°

65.
$$M = 3N = \frac{P}{4} = Q + 5 = \frac{R}{7} > 0$$

Based on the statement above, which variable has the **greatest** value?

A. M
B. N
C. P
D. R

66. A roofing contractor uses shingles at a rate of 3 bundles for every 96 square feet of roof covered. At this rate, how many bundles of shingles will he need in order to cover a roof that is 416 square feet?

E. 5
F. 12
G. 13
H. 14

67. To make party invitations, Macie could buy a package of paper for \$10.50, or she could buy x individual sheets of the same paper for \$0.15 each. What is the largest value of x that would make buying the individual sheets **less** expensive than buying the package?

A. 60
B. 65
C. 69
D. 70

68. At 1:00 p.m. one day, the temperature was 8 degrees above zero. During the rest of the day, the temperature fell 3 degrees per hour. What was the temperature at 7:00 p.m. that day?

- E. -13°
- F. -10°
- G. -7°
- H. 5°

69. A bag contains 75 marbles that are red, blue, or green. The ratio of red to blue marbles is 15:7, and the ratio of blue to green marbles is 7:3. If 2 blue marbles are removed and replaced with 2 green marbles, what will be the new ratio of red to green marbles?

- A. 3:1
- B. 5:1
- C. 15:3
- D. 45:11

70.

DESSERT CHOICES

Dessert	Number of Times Ordered
Cookies	42
Pie	23
Cake	47
Ice Cream	48

The table above shows the number of times that different desserts were ordered at a restaurant. Based on this information, what is the probability of a customer ordering ice cream as a dessert?

- E. 25%
- F. 30%
- G. 40%
- H. 48%

71. What is the least common multiple of 24, 6, and 18?

- A. 36
- B. 48
- C. 72
- D. 144

72. One day, the Early Bird Restaurant used 15 dozen eggs for 200 breakfast customers. At this rate, approximately how many dozen eggs are needed for 300 breakfast customers?

- E. 20
- F. 23
- G. 25
- H. 30

73. A cooler contains three types of beverages: 5 bottles of apple juice, 3 bottles of grape juice, and 6 bottles of orange juice. What is the probability that a bottle chosen at random from this cooler is **not** apple juice?

- A. $\frac{1}{9}$
- B. $\frac{5}{14}$
- C. $\frac{9}{14}$
- D. $\frac{2}{3}$

74. A large circular dinner plate has a radius of 20 centimeters. A smaller circular plate with a circumference of 20π centimeters is placed in the center of the larger dinner plate. What is the area of the part of the larger dinner plate that is not covered by the smaller plate?

- E. 20π sq cm
- F. 100π sq cm
- G. 200π sq cm
- H. 300π sq cm

75.

PRICES FOR NEWSPAPER
ADVERTISING

Page Space	Price
$\frac{1}{4}$ page	\$200
$\frac{1}{2}$ page	\$350
full page	\$600

The table above shows prices for newspaper advertising. A store purchased $\frac{1}{4}$ pages, $\frac{1}{2}$ pages, and full pages of page space in equal numbers for a total of \$11,500. What is the total amount of page space the store purchased?

- A. $1\frac{3}{4}$ pages
- B. 10 pages
- C. $16\frac{1}{2}$ pages
- D. $17\frac{1}{2}$ pages

76. How many positive odd numbers satisfy the inequality $3x + 8 \leq 92$?

- E. 13
- F. 14
- G. 17
- H. 28

77. If $\frac{36}{y} = 4x$, what is the value of x when $y = 3$?

- A. 3
- B. 4
- C. 9
- D. 12

78. Points X, Y, and Z are on a straight line, and Y is between X and Z. Length $\overline{YZ} = \frac{3}{5}\overline{XY}$, and length $\overline{XY} = 20$ centimeters. What is the length of \overline{XZ} ?

- E. 12 cm
- F. 24 cm
- G. 30 cm
- H. 32 cm

79. Bryana bought $1\frac{3}{4}$ yards of cloth at \$8.00 per yard. If there was an 8% sales tax, what was the total cost of the cloth?

- A. \$12.96
- B. \$14.08
- C. \$15.12
- D. \$16.08

80.



On the number line above, $MN = 5\frac{5}{6}$. What is the position of point M?

- E. $-7\frac{1}{6}$
- F. $-4\frac{1}{2}$
- G. $4\frac{1}{2}$
- H. $7\frac{1}{6}$

81. A United States presidential coin is made from an alloy of four metals—copper, zinc, manganese, and nickel—with weights in the ratio of 177:12:7:4, respectively. The coin weighs a total of 8 grams. What is the weight of the zinc in this coin?

- A. 0.28 g
- B. 0.48 g
- C. 0.96 g
- D. 48 g

82. Jack scored a mean of 15 points per game in his first 3 basketball games. In his 4th game, he scored 27 points. What is his mean score for the first 4 games?

- E. 15
- F. 17
- G. 18
- H. 21

83. A cylindrical oil drum can hold 4,320 liters when it is completely full. Currently, the drum is $\frac{1}{3}$ full of oil. How many **kiloliters** of oil need to be added in order to fill the drum completely?
- A. 1.44
B. 2.88
C. 4.32
D. 14.10

84. Nicole's age now is three times Carmen's age. If Carmen will be 17 in two years, how old was Nicole 5 years ago?
- E. 38 yr
F. 40 yr
G. 45 yr
H. 50 yr

85. A chemical decays in such a way that the amount left at the end of each week is 20% less than the amount at the beginning of that same week. What percent of the original amount is left after two weeks?
- A. 40%
B. 60%
C. 64%
D. 80%

86. If $w - 1$ is an odd integer, which one of the following **must** be an even integer?
- E. $w + 1$
F. $2w - 1$
G. $2w - 2$
H. $2w + 1$

87. Three students stand at the starting line of a running track and begin running laps at the same time. Ann completes 1 lap every 2 minutes, Jack completes 1 lap every 3 minutes, and Lee completes 1 lap every 4 minutes. How many laps does Ann complete before all three runners are once again at the starting line at the same time?
- A. 4
B. 6
C. 12
D. 20

88. Simplify this expression:

$$4(7 - 3x) - (5 - x)$$

- E. $23 - 4x$
F. $23 - 11x$
G. $28 - 4x$
H. $28 - 12x$

89.

PET SURVEY

Number of Pets	Number of Students
0	12
1	16
2	7
3 or more	5

Amy surveyed students at her school about the number of pets they have. What is the probability that a student who participated in the survey has at least 2 pets?

- A. $\frac{7}{40}$
- B. $\frac{1}{12}$
- C. $\frac{1}{8}$
- D. $\frac{3}{10}$

90. A large container is partially filled with n liters of water. Ito adds 10 liters of water to the container, making it 60% full. If Ignacio adds 6 more liters of water, the container will be 75% full. What is the value of n ?

- E. 14
- F. 15
- G. 26
- H. 30

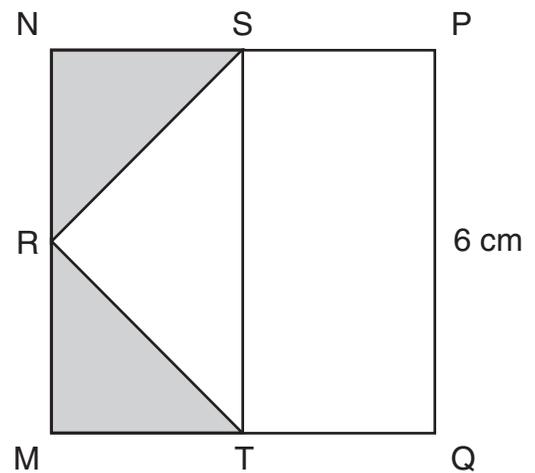
91.

$$5x^3 + 3x + 9 + \frac{1}{x^2}$$

If $x = 10$, what is the value of the expression above?

- A. 2,539.01
- B. 5,039.01
- C. 5,039.1
- D. 5,139

92.



R, S, and T are midpoints of the sides of square MNPQ, as shown above. What is the sum of the areas of the shaded triangles?

- E. 9 sq cm
- F. 12 sq cm
- G. 18 sq cm
- H. 36 sq cm

93. The Chens spend \$5 of every \$8 they earn on planned expenses. If the family earns \$29,600 in one year, how much will they spend on planned expenses that year?

- A. \$1,850
- B. \$3,700
- C. \$5,920
- D. \$18,500

94. A pizza shop offers a choice of 3 sizes (small, medium, and large) and 7 different toppings. Different pizzas can be created by changing the size and/or the choice of toppings. If Cody wants to order a pizza with exactly 2 different toppings, how many different pizzas can he create?

- E. 6
- F. 21
- G. 63
- H. 126

95.

SURVEY OF CATS PER FAMILY

Number of Cats	Number of Families
0	15
1	42
2	35
3 or more	8

The table above shows the number of cats per family in 100 households in the Blaine neighborhood. By what **percentage** is the number of families with 1 cat greater than the number of families with 2 cats?

- A. 7%
- B. 10%
- C. 17%
- D. 20%

96. A wooden box has a square base. The height of this box is 3 times the length of one side of the base. If one side of the base is 3 feet long, what is the volume of this box?

- E. 9 cu ft
- F. 27 cu ft
- G. 36 cu ft
- H. 81 cu ft

97. On a bike trip, Rajiv traveled 65 kilometers in 5 hours, while Shaina traveled 72 kilometers in 4 hours. How much **less** was Rajiv's mean speed, in kilometers per hour (kph), than Shaina's?

- A. 1
- B. 5
- C. 7
- D. 9

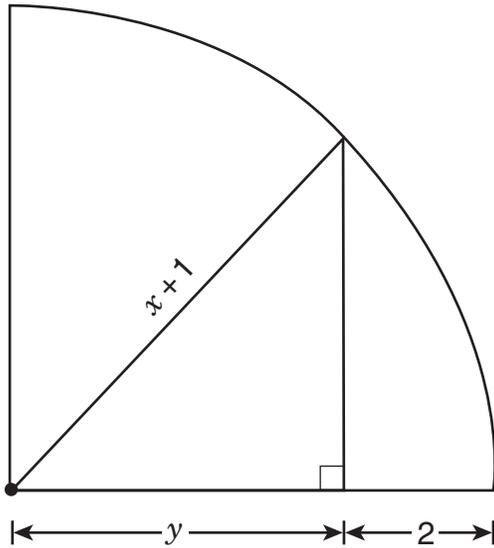
98. Points P, Q, R, and S represent -3 , -1 , 0 , and 2 , respectively, on a number line. How many units is the midpoint of \overline{PQ} from the midpoint of \overline{RS} ?

- E. 1
- F. 2
- G. 3
- H. 4

99. There are 1,000 cubic centimeters in 1 liter, and 1,000 cubic millimeters in 1 milliliter. How many cubic millimeters are there in 1,000 cubic centimeters?

- A. 1,000
- B. 10,000
- C. 100,000
- D. 1,000,000

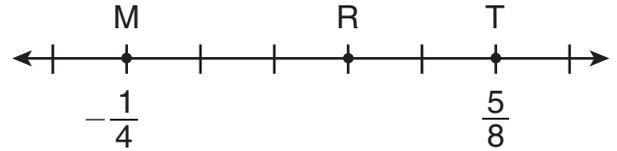
100.



In the quarter circle above, what is y in terms of x ?

- E. $x - 1$
- F. $x + 1$
- G. $\frac{x+1}{2}$
- H. $\sqrt{\frac{(x+1)^2}{2}}$

101.



The hash marks on the number line above are evenly spaced. What is the coordinate of point R?

- A. $\frac{7}{40}$
- B. $\frac{9}{40}$
- C. $\frac{11}{40}$
- D. $\frac{21}{40}$

102. Phan chose an Internet service that charges \$18.00 per month plus \$0.024 per minute. Deion chose an Internet service that charges \$30.00 per month for unlimited usage. At the end of the month, Phan's and Deion's charges were identical. For how many minutes did Phan use the Internet service that month?

- E. 50
- F. 60
- G. 100
- H. 500

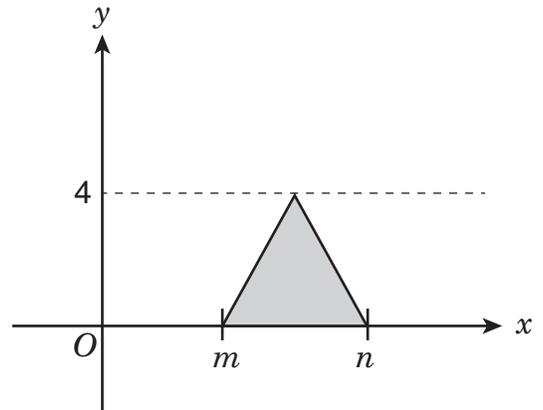
103. In a sample of 50 cars at a local dealership, there are 12 red cars and 10 cars with backup cameras. Of the 12 red cars, 4 have backup cameras. If a car is selected at random from the given sample, what is the probability that **both** of the following are true: the car is **not** red and does **not** have a backup camera?

- A. $\frac{3}{5}$
- B. $\frac{16}{25}$
- C. $\frac{19}{25}$
- D. $\frac{4}{5}$

104. The decimal 0.06 can be written as the fraction $\frac{x}{50}$. What is the value of x ?

- E. 3
- F. 6
- G. 12
- H. 30

105.



What is the area of the shaded triangle shown above?

- A. $m + n$
- B. $n - m$
- C. $2(n - m)$
- D. $4(n - m)$

106.

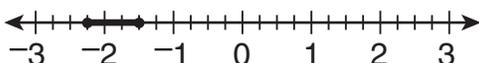
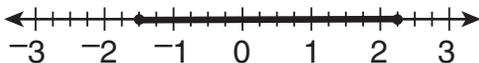
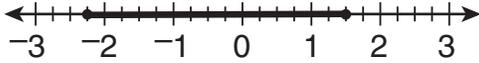
ANIMAL CARDS

Number of Cards	Picture on Card
8	cat
6	dog
5	bird
4	fish
1	horse

The cards in the table above are mixed in a box. Which animal pictured on a card has exactly a 1 in 4 chance of being picked at random from the box?

- E. cat
- F. dog
- G. fish
- H. horse

107. Which number line below shows the solution set for $2x - 2 \leq y \leq 4x + 10$ when $y = 1$?

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

108.

$$\frac{14}{21} = \frac{p}{7}$$

In the equation above, what is the value of p ?

- E. $\frac{2}{3}$
- F. 3
- G. $\frac{14}{3}$
- H. 14

109. A ball is selected at random from a box that contains 7 black balls, 14 green balls, and 21 red balls. What is the probability that the ball selected is black?

- A. $\frac{1}{6}$
- B. $\frac{1}{5}$
- C. $\frac{1}{3}$
- D. $\frac{5}{6}$

110. At North High School, a survey asked two questions, Question A and Question B. For each question, students could answer either “yes” or “no.” Of the 800 students who responded to the survey, 720 answered “yes” to Question A, and 640 answered “yes” to Question B. What is the **least** possible number of these students who could have answered “yes” to **both** questions?

- E. 80
- F. 160
- G. 560
- H. 640

111. Raoul is at least 3 years older than Vahn. Which of the following inequalities gives the relationship between Raoul's age (r) and Vahn's age (v)?

- A. $r - v \geq 3$
- B. $r - v \leq 3$
- C. $3 - v \leq r$
- D. $3 - r \leq v$

112. 1 sind = 5.6 ricks
 1 sind = 12.88 dalts

Using the conversion above, how many dalts are equal to 1 rick?

- E. 0.43
- F. 2.30
- G. 7.28
- H. 18.48

113. There are now x cans stacked on a shelf that holds 36 cans when full. If 4 of these cans were removed, the shelf would be half full. What is the value of x ?

- A. 14
- B. 16
- C. 18
- D. 22

114. Carlos tossed a paper cup in the air 50 times and found that the probability of it landing on its side was 72%. If he tosses the cup in the air 150 **more** times, what is the total number of times he can expect the cup to land on its side?

- E. 72
- F. 108
- G. 144
- H. 158

REVISING/EDITING PART A

1. (B) The question asks for the correction needed for an error in the sentence. The sentence needs a comma to set off the clause “which is considered one of the ‘new’ Seven Wonders of the World,” because the clause is not essential to the meaning of the sentence (nonrestrictive clause). Option B is correct because it places a comma where it is needed, after “Italy,” to set off the nonrestrictive clause that follows. Option A is incorrect because when a name has more than one element, a comma is used to separate the elements for clarity. Option C is incorrect because it would remove the comma at the end of the nonrestrictive clause, which should be set off by commas at the beginning and the end. Option D is incorrect because a comma after “built” would separate the phrase “could hold more than 50,000 spectators,” which is a dependent clause that uses the subject from the main clause and so needs to stay connected to the rest of the sentence.

2. (E) The question asks for the correction of an error in sentence structure in the paragraph. The first sentence is a run-on sentence because both clauses—“In September 2016 the National Museum of African American History and Culture opened as part of the Smithsonian Institution” and “the museum is already the Smithsonian’s third most popular site”—are independent clauses, and independent clauses should not be combined without the use of a conjunction and a comma. The revision in Option E adds the word “and” before the comma, which corrects the run-on. Option F, Option G, Option H are incorrect responses because the corresponding underlined portions in the paragraph are not structural errors. No edits are needed to correct those portions of the text.

3. (C) The question asks for the correct revision of the sentence in the box. The sentence is incorrect because, as written, the phrase “to promote their club” refers to the closest noun to the phrase, which is “a bake sale,” and that does not match logically. Option C is correct because the revision has the phrase “to promote their club” clearly modifying “members of the debate team” and adds the idea that the bake sale is on Wednesday to the end of the sentence. Option A and Option B are incorrect because the revisions do not fix the error that “to promote their club” modifies “a bake sale.” Option D is incorrect; while the revision clarifies that “to promote their club” relates to the “members of the debate team,” the rest of the sentence is poorly written because the insertion of “on Wednesday to promote their club” in the middle of the sentence interrupts the main clause, “Members of the debate team will sponsor a bake sale.”

4. (G) The question asks for the necessary revisions to the paragraph. Option G is correct because the errors appear in sentence 3 of the paragraph. The word “studies” is in the present tense, but it should be changed to “studied” 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. Option E is incorrect because sentence 1 does not need to be revised. The word “spent” is correct in the past tense, and there is no need to insert a comma after the word “play.” Option F is incorrect because sentence 2 does not need to be revised. The word “did” is correct as written in the past tense, and 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. Option H is incorrect because sentence 4 does not need to be revised. The word “recited” is correct as written in the past tense, and the comma after “times” is needed in order to separate the modifying phrase “making slight adjustments and improvements to his performance each time” from the main clause.

REVISING/EDITING PART B

The Local Library

5. (A) The question asks for a sentence that should replace sentence 4 to introduce the main claim of the passage. Option A is correct because it best presents the main claim that the public library is a valuable resource and should be used by community members. Option B is incorrect because it states that going to the library can be a learning experience. This idea is implied in sentences 17 and 18, but it is not the main claim of the passage. Option C is incorrect because it states the idea that the library is useful for students, which would be supporting evidence rather than an introductory statement expressing the main claim. Option D is incorrect because it states that local libraries provide services to help improve communities, which is explained in sentences 15–18, but it does not present the main claim.

6. (H) The question asks which option would provide the best support for sentence 8. Sentence 8 expresses the idea that the library helps community members meet their need for human connection and companionship. Option H is correct because it provides support for sentence 8 and strengthens the connection between the

information in sentence 8 and the main claim of the passage by listing examples of how people can connect at the library. Option E is incorrect because it references the history of the library, which does not support the idea in sentence 8 or the main claim of the passage. Option F is incorrect because, although it introduces the idea of community meetings, it does not support the idea in sentence 8. Option G is incorrect because it mentions expectations by the community members and brings up a new idea that is unrelated to the main claim of the passage and that does not provide support for sentence 8.

7. (A) The question asks for the revision of sentence 12 that best maintains the formal style established in the passage. Option A correctly maintains the formal style by using “people” instead of “you” and the more formal language “resources available” and “accomplish many tasks.” Option B is incorrect because it uses second person, directly addressing the reader, which is informal. Option C is incorrect because, even though it does not use second person, it uses informal language like “work on” and “things.” Option D is incorrect because it uses the informal phrase “whatever you need to do” in addition to informally addressing the reader through the use of second person.

8. (G) The question asks where sentence 17 should be moved in order to improve the organization of the fourth paragraph. Sentence 17 describes a typical librarian and the assistance he or she provides in the library. Option G correctly places sentence 17, an example of what else the librarian does, after the librarian is introduced in sentence 14. Option E is incorrect because it places the sentence before the main idea of the paragraph, which states that public libraries offer a variety of resources. Sentence 17 is an example of one of the resources, so it would not be placed at the beginning of the paragraph before the main idea. Option F is incorrect because it moves the sentence to before the librarian is introduced in the paragraph. Option H is incorrect because sentences 15 and 16 have shifted away from the topic of the librarian, so the details in sentence 17 would not logically fit between them.

9. (B) The question asks for a concluding sentence that would follow sentence 19 and support the argument presented in the passage. Option B is correct because it logically follows sentence 19 and supports the argument that the public library facilitates connections within a community and provides valuable services—some at no cost—by urging community members to use, maintain, and support their local public library. Option A is

incorrect because it does not provide a logical conclusion that fully supports the argument in the passage; the sentence addresses only one benefit of having a public library, ignoring the valuable services and resources it provides. Option C is incorrect because it presents the idea that the library has been in existence since 1833, which does not logically provide a conclusion for the passage or support the argument developed in the passage. Option D is incorrect because it presents a new claim—community leaders must work together to support library events—instead of a conclusion that supports the argument presented in the passage.

READING COMPREHENSION

The Tunguska Fireball

10. (H) The question asks for evidence that best supports a detail in the passage. When scientists were able to travel to the site almost two decades after the blast, they found a circle of “scorched and downed trees” that marked the blast site (paragraph 2), making Option H the correct answer. Option E is incorrect because, although the scientists searched for a crater, they never found one (paragraph 2). Option F is also incorrect because the tremors recorded at a seismic station thousands of miles away detailed the magnitude of the event, not the location (paragraph 1). Option G is incorrect because, although huts were flattened when the blast occurred, the destruction of the huts was not evident when the site was found almost two decades later (paragraph 1).

11. (A) The question asks why the June 30 date bears significance to some scientists. Scientists noted that Earth was passing through cometary debris on June 30, 1908 (paragraph 4), which supports the idea stated in Option A, making it the correct response. Option B is incorrect because, while it states a detail from the passage, the detail is not connected to the June 30 date. Option C is incorrect because it states a theory regarding the cause of the impact that is not tied to the date of June 30. Option D is incorrect because this detail is used in the passage to suggest that such a blast could not have been caused by a comet.

12. (E) The question asks for the evidence found after Galli’s analysis. Galli discovered unusually high levels of some elements, such as copper, gold, and nickel, which are common elements in particles from outer space that were abundant in the tree resin (paragraph 6), as stated in Option E. Option F is incorrect because it refers to a

EXPLANATIONS OF CORRECT ANSWERS *continued...*

prior finding of Galli's, not what his analysis of the tree resin revealed. Option G is incorrect because, although the spruce trees did survive the blast, they were the trees Galli studied rather than a revelation from his studies. Option H is incorrect because it was previously known that meteorites contained these elements, and that information was not revealed by Galli's analysis.

13. (B) The question asks for the most likely reason it was difficult for scientists to discover the site of the Tunguska explosion. Paragraph 2 notes that the site of the blast was very "remote," as stated in Option B. Option A is incorrect because none of the possible blast explanations mentioned in the passage suggest a nuclear explosion or radioactivity. Option C is incorrect because, even before visiting the site, scientists debated possible causes of the explosion (paragraphs 2–3). Option D is incorrect because the passage states in paragraph 2 that no evidence of a crater, or craters, was ever found.

14. (F) The questions asks for an explanation of how paragraph 1 supports the passage. Paragraph 1 provides several examples of the severe damage caused by the explosion, as stated in Option F. Option E is incorrect because the scientific aspects of the explosion are not discussed until later in the passage. Option G is incorrect because paragraph 1 discusses some of the effects of the blast rather than the potential cause. Although human suffering is one detail described in paragraph 1, this is not the primary evidence of the explosion's destruction, making Option H incorrect.

15. (D) The question asks how the questions at the end of the last paragraph affect the passage. Although the passage introduces a number of theories about the Tunguska explosion, no definitive explanation has been reached. This idea is stated in Option D. Option A is incorrect because, although the passage does not discourage further study, it does not specifically promote it. Option B is incorrect because, although the author presents multiple possible causes, the passage suggests that the damage was most likely caused by one of these possibilities rather than several of them simultaneously. The author is certainly curious about the actual cause of the Tunguska explosion but objectively presents the questions about it that remain unanswered, making Option C incorrect.

Excerpt from *A Voice in the Wilderness*

16. (G) The question asks how the phrase affects the tone in the first part of the excerpt. The phrase includes the

words "all three" and "taken the trouble," emphasizing Margaret's early frustration as she recalls with some confused irritation that the men thought she needed an abundance of help earlier, but none of them is around to help when the train stops, as indicated in Option G. Option E is incorrect because when Margaret recalls the interaction, there is no indication that she blames the men for her current problem. Option F is incorrect because, while the description of how Margaret "hastily [gathers] up her belongings" and "[hurries] down the aisle" (paragraph 1) gives the appearance of being defiant, there is no evidence that she intentionally put herself in this vulnerable position just to make a point. Option H is incorrect because when Margaret recalls the interaction, there is no evidence that she appreciates the care shown to her, but rather she seems a bit offended that the men do not think she could take care of herself, as shown by the author's description of the forceful way she exits the train without assistance when it stops.

17. (C) The question asks for evidence from the passage that best supports the claim that Margaret is unfamiliar with traveling to new places. If Margaret has never traveled to this region by train before, she must guess or attempt to interpret what she sees. This idea is best represented in the sentence in paragraph 3 (Option C) where she questions whether the stations in the West have platforms. The sentence in paragraph 1 (Option A) is an incorrect response because Margaret's actions in the sentence are decisive as she gathers her belongings to disembark; she is familiar with rail travel. The sentence in paragraph 2 (Option B) is an incorrect response because, in the sentence, Margaret is using her knowledge about trains to attempt to interpret the actions of others; she is familiar with trains, even if a particular destination has not been mentioned. The sentence in paragraph 4 (Option D) is an incorrect response because, while the sentence shows that Margaret is trying to better understand her situation in the darkness, her ability to identify the train's engine and the figures carrying lanterns indicates some familiarity with her mode of travel.

18. (H) The question asks which sentence correctly explains the connection between the sentence from paragraph 4 and the overall plot of the excerpt. The train's need to stop for water is not evident to Margaret, which causes the external conflict. The sentence from paragraph 4 reveals how Margaret's confusion over her best course of action prevents her from recognizing the nature of the external conflict; therefore, Option H is correct. Option E is incorrect because Margaret's reliance

EXPLANATIONS OF CORRECT ANSWERS *continued...*

on others is not demonstrated in the sentence, and her reliance on others does not contribute to the external conflict. Option F is incorrect because her concern for the opinion of others is not the main cause for her external conflict. Option G is incorrect because Margaret's indecision has no effect on the cause of the conflict.

19. (B) The question asks how the simile in the sentence from paragraph 4 reflects the tone of the paragraph. The image of two or three fireflies creating small specks of light in the darkness creates a sense of isolation or loneliness in Margaret, as shown in the sentence, "A sudden feeling of isolation took possession of her" (paragraph 4). Therefore, Option B is correct. Option A is incorrect because Margaret is confused and indecisive, showing her discomfort with her situation. Option C is incorrect because Margaret expresses distress in her situation, questions her decision, and worries about being labeled a "fool" (paragraph 4). Option D is incorrect because the simile is meant to show how far away things are from Margaret, not create a feeling of dread, which develops later in paragraph 9.

20. (H) The question asks for an explanation of what the imagery in the excerpt from paragraph 9 conveys. The words "useless" and "failure" in the sentence indicate that Margaret's best efforts do not help her. The phrase "the last car slatted itself past" shows that Margaret is helpless to stop the train from departing, which leaves her completely vulnerable, as described in Option H. Option E is incorrect because describing Margaret's "sickening sense of terror" indicates that she is extremely afraid of being left behind rather than increasingly irritated with the other passengers. Option F is incorrect because Margaret spends her time "screaming, running, trying to attract some one's attention" in an effort to be noticed so that the train will stop, not attempting to run as fast as the train. Option G is incorrect because while Margaret's screaming and running could easily suggest feelings of anger, descriptions of her "sickening sense of terror and failure" indicate otherwise.

21. (A) The question asks about the relationship between the theme and paragraph 9, where Margaret desperately tries to get someone on the train to notice her. One important theme of this excerpt concerns Margaret's willingness to take action to ensure that she reaches her destination. This determination, described in Option A, is why she gathers her belongings together without help, gets off the train without being assisted by employees, and then attempts to climb back on while the train employees are busy examining the engine. Option B

is incorrect because, while the narrator describes her screaming as useless, she does not feel that her efforts overall are useless, and she does not give up until paragraph 10. Option C is incorrect because, while Margaret is feeling a sense of "failure" in paragraph 9, she does not condemn herself as the train moves away. Option D is incorrect because Margaret has expressed "terror" in paragraph 9 over being unable to catch someone's attention, not frustration over her lack of control over her surroundings.

22. (H) The question asks for what the figurative language illustrates in the sentence. As Margaret stands and reaches out "helpless hands," the language used to describe the train as "swinging tauntingly" and having "a leer in its eye" confirms Margaret's fears of being left alone and feeling foolish; there is nothing she can do to change the situation, as expressed in Option H. Option E is incorrect because, while the image of Margaret's helpless hands dropping at her sides could suggest a sense of doubt, the figurative language in the sentence emphasizes a different feeling about her situation and does not indicate her intentions. Option F is incorrect because, while the figurative language seems to give a malevolent quality to the train, it is not referring to the people onboard, who are described in paragraph 8 as "comfortable and safe inside, unconscious of her need." Option G is incorrect because, while Margaret is worried in paragraph 4 about embarrassing herself, she now feels "dazed" because she is overwhelmed with the seriousness of what has just happened.

23. (A) The question asks how paragraph 11 helps shape the overall plot of the excerpt. In paragraph 5, Margaret assumes there is a station, "It was probably on the other [side], but she was standing too near the cars to see," but in paragraph 11, the station that had been "so real" in Margaret's mind actually does not exist, supporting Option A as the correct response. Option B is incorrect because Margaret's main problem is not that she has imagined the station on the other side of the train but that it actually isn't there. Option C is incorrect because, while Margaret seems somewhat in awe of her surroundings in paragraph 12 and she "gasped" in paragraph 11, her exclamation is one of shock at the discovery, not surprise over an unexpected adventure. Option D is incorrect because the paragraph mainly describes what Margaret does in the particular situation she is currently in but does not explain or provide details that give insight to Margaret's personality in general.

24. (G) The question asks how the details about the setting support the theme of the excerpt. In paragraph 12, phrases such as “vast dome of curving blue” and “the beauty of the lonely night” describe the beauty of the place. However, in paragraph 13, the author writes, “no building broke the inky outlines of the plain, nor friendly light streamed out to cheer her heart” to express how alone Margaret really is. These phrases demonstrate that Option G is correct. Option E is incorrect because positive phrases such as “largest, most wonderful stars” show that Margaret is not overwhelmed by the darkness. Option F is incorrect because, while Margaret is feeling helpless and alone at the recent realization that there is no station (paragraph 11), the descriptions of the landscape, which focus on the beauty and mysteriousness of the place, do not signify hope but rather how quiet and isolated the location is. Option H is incorrect because, while Margaret has expressed fear in paragraphs 9–11, the details in paragraphs 12–13 do not show that she is discouraged but rather that she is aware of her situation because she sees no buildings or light.

Excerpt from “Niagara Falls”

25. (D) The question asks for a specific detail from paragraph 2 that conveys the central idea that the Falls communicates a feeling of “unintelligible disaster” (paragraph 1). The sound of falling is described in paragraph 2 as “a noise of unspecified ruin,” so Option D is correct because it best connects with the idea of “unintelligible disaster” mentioned in paragraph 1. Option A is incorrect because, although the water is described as “diaphanous as a precious stone” in paragraph 2 because of the “glow” coming from the interaction of the light, there are no stones within the water. Option B is incorrect because the details in paragraph 2 about the flow of colors in the water are described as an “ever-altering wonder,” which conveys a sense of beauty and not a sense of disaster. Option C is incorrect because the rainbows in paragraph 2 are described as “vivid” and accompanying someone “courteously” while he or she walks, which contributes to the idea that the appearance and disappearance of the rainbows are a pleasant experience and not disastrous.

26. (G) The question asks for the effect of the comparison being made in the sentence in paragraph 2. The word “lacework” in the sentence suggests an elegant piece of craftsmanship, and the “one long curtain” and “extraordinarily level” aspects of the Falls mean that the Falls are uniform or consistent; therefore, Option G is correct. Option E is incorrect because neither “lacework and woven foam,” nor the quality of being

extremely level, are related to timelessness. Option F is incorrect because, while a curtain may suggest the idea of something being hidden or secret, the description of a delicate “lacework” curtain does not suggest this purpose. Option H is incorrect because “lacework” is generally fragile and does not suggest great strength.

27. (C) The question asks for the statement that best describes how the sentence from paragraph 3 fits into the overall structure of the excerpt. The first sentence of paragraph 3 moves the description “beyond the foot of the Falls” to “the river” and then begins to describe this location before confirming it again with the words “these are the lower rapids.” This emphasis on the shift in location is best stated in Option C, making it the correct response. Option A is incorrect because, as the first sentence in paragraph 3 states, the paragraph describes the river and not aspects of the Falls. Option B is incorrect because the entire paragraph describes only the literal movements of the river. Option D is incorrect because the features of the rapids, as described in paragraph 3, are all obvious and not hidden.

28. (E) The question asks for the sentence from the excerpt that best supports the idea that the essence of the Falls lies in their emotional impact. The first sentence in the excerpt establishes the “real secret of the beauty and terror of the Falls . . . lies in the feeling of colossal power and unintelligible disaster.” Option E is correct because the sentence in Option A best supports this notion by identifying these qualities as “the heart,” or essence, of the Falls. While “delicate” and “fragile” are words that can be connected with certain kinds of emotions, in the sentence in Option F, they are connected with physical beauty, so Option F is incorrect. Option G is incorrect because, while the sentence in Option G describes the power of the Falls’ to engage one in thought, it does not best support the idea that the essence of the Falls lies in their emotional impact. Option H is incorrect because the sentence in Option H describes thoughts one may have while watching the Falls and is not focused on the Falls’ emotional impact.

29. (D) The question asks how the sentence from paragraph 4 contributes to the development of ideas in the excerpt. The description of “cloudy thoughts of destiny and the passage of empires” in the sentence refers to the types of thoughts a person might have while observing the Falls, as stated in Option D. Option A is incorrect because the sentence focuses on the idea that the Falls are a place of great contemplation but does not clarify that these thoughts are life-changing. Option

EXPLANATIONS OF CORRECT ANSWERS *continued...*

B is incorrect because the sentence does not describe focused thoughts of a personal nature; the grand, sweeping nature of the falls inspire thoughts of the same caliber as “the passage of empires.” Option C is incorrect because the sentence is about how the Falls inspire great thoughts but is not about how difficult it is to grasp the grandeur of the Falls.

30. (F) The question asks how the discussion of human life and history is illustrated in paragraph 4 of the excerpt. The author concludes in paragraph 4 that the Falls can be compared to people and history by writing, “both men and nations are hurried onwards to their ruin or ending as inevitably as this dark flood,” making Option F correct. Option E is incorrect because the discussion of rainbows in paragraph 4 focuses on the fate of art and beauty, not of humanity (“I could not get out of my mind the thought of a friend, who said that the rainbows over the Falls were like the arts and beauty and goodness, with regard to the stream of life—caused by it, thrown upon its spray, but unable to stay or direct or affect it, and ceasing when it ceased”). Option G is incorrect because, in paragraph 4, the author talks about people in general when discussing “men and nations” and provides no evidence of the differences in specific individuals’ experience of the Falls. Option H is incorrect because, while the setting at night does provide a place of contemplation, the author notes the “dark flood” as the overall illustration of the human experience.

31. (A) The question asks for the statement the author would agree with most. In paragraph 4, the author states that the Falls make a person feel “with an almost insupportable and yet comforting certitude, that both men and nations are hurried onwards to their ruin or ending.” Later, the final sentence says, “With some such thoughts does the platitudinous heart win from the confusion and thunder of a Niagara peace.” This sentence supports the author’s belief that a person can find peace in accepting the certainty of his or her own ending, as expressed in Option A. Option B is incorrect because the author does not discuss regrets in the excerpt. Option C is incorrect because, while the excerpt discusses fear when looking at the power of the Falls, the excerpt does not support the idea that one should defy fear. Option D is incorrect because the excerpt states in paragraph 4 that art is “unable to stay.”

Uncovering the Past

32. (E) The question asks for a summary of what the goal of modern archaeology is in general. The passage is

mostly about how archaeology has evolved from efforts to discover ancient artwork and museum pieces to using technology to piece together a sense of life in early civilizations, which is best described in Option E. Option F is incorrect because it states the goal of archaeology in the past, not in modern times. Option G is incorrect because finding settlements is not the goal but just the first step in the modern archaeological process. Option H is incorrect because it states the goal of traditional, rather than modern, archaeology.

33. (B) The question asks what artifacts a traditional archaeologist would be interested in finding based on the material in the passage. The passage explains that, unlike modern archaeologists, traditional archaeologists are interested in valuable items from the past rather than learning about the people from the past and their lifestyles. Jewelry and ceramics are examples of valuable items, which makes Option B correct. Option A is incorrect because human skeletons would be valuable to modern archaeologists, not traditional archaeologists. Option C is incorrect because it is a detail that relates to modern archaeologists’ efforts to study people, not just valuable items. Option D is incorrect because the remains of animals would also advance the goals of modern, rather than traditional, archaeologists.

34. (E) The question asks how paragraph 2 supports the structure of the passage. The first paragraph provides history on the field of archaeology, specifically what has come to be known as traditional archaeology. Paragraph 2 describes how modern archaeology differs from traditional archaeology, which is detailed in Option E. Option F is incorrect because paragraph 2 provides no support for paragraph 1. Option G is incorrect because paragraph 2 provides facts about modern archaeology and does not introduce a theory. The remainder of the passage describes how modern archaeology was used at one specific dig, which is not mentioned in paragraph 2, making Option H incorrect.

35. (B) The question asks for the concluding sentence that best summarizes the information from paragraph 4. Paragraph 4 explains that Camelia’s age was determined through an examination of her teeth, which makes the conclusion in Option B the correct answer. Option A is incorrect because the excavation discussed in the paragraph is at a house, not a theater or temple. Option C is incorrect because, although Camelia’s body was smaller than a thirteen-year-old’s would be expected to be, the passage does not go into enough detail to suggest that all people from the past were smaller than people

are today. Option D is also incorrect because there is no evidence in the passage of Camelia's death being the result of a crime.

36. (H) The question asks what archaeologists learned about the ancient culture based on the evidence found in paragraphs 4–5. Paragraph 5 states that a paleobotanist identified four domesticated grains within a bake oven at the site, which supports Option H. Option E is incorrect because there is not enough evidence in either paragraph to support the broad assumption that people in Kourion had a better diet than people today. Option F is incorrect because the passage mentions the discovery of the remains of only one domesticated animal, which does not support the idea that Kourion people kept a wide variety of domesticated animals. Option G is incorrect because paragraph 4 states that Camelia's age was determined to be about thirteen at the time of her death, but since her death was likely caused by a natural disaster, the suggestion that all Kourion people had a shorter life expectancy than people today is not supported.

37. (D) The question asks for the strongest reason for the author mentioning the zooarchaeologist in the passage. The primary purpose of the passage is to explain and describe modern archaeology, the technology it employs, and various aspects of the field. Zooarchaeology is a specialty within the field, which is stated in Option D. Option A is incorrect because other artifacts found near Camelia could have been introduced without mentioning the zooarchaeologist. Option B is incorrect because the text does not state any comparisons between zooarchaeologists and paleoarchaeologists. Option C is incorrect because the passage does not provide a list of archaeological specialists.

Snowy Mountains

38. (F) The question asks how the description in the first stanza helps establish a central idea of the poem. The poem is mostly about the grandeur of the mountains in spite of the spread of civilization. The first stanza contrasts these two elements, which is stated in Option F. Option E is incorrect because it is a detail that is referenced later in the poem. Option G is incorrect because the poem actually communicates the message that people do not recognize the greatness of the mountains. Option H is incorrect because, although the first stanza mentions the size of the mountains, it does not imply that people cannot see how large the mountains are.

39. (B) The question asks how the parallel structure of lines 1 and 15 affect the poem. Lines 1 and 15 communicate the feeling that the mountains are even higher and vaster than can be comprehended upon first view. This observation reflects the awe that the speaker feels, which is reinforced by the parallel structure of the lines, as stated in Option B. Option A is incorrect because the speaker never hints at fear when describing the mountains. Option C is incorrect because it reflects a literal interpretation of the figurative language in the two parallel lines: the mountains do not actually grow larger but are simply larger than can be understood at first. Option D is incorrect because the parallel structure of lines 1 and 15 is not meant to stress any sort of contrast between height and area but to reinforce the speaker's feeling by complementing each other.

40. (E) The question asks how the line from the poem helps develop the theme of the poem. Line 5 helps develop the theme that the mountains are more important than people realize by suggesting that the mountains serve a noble, foundational purpose in the world, as explained in Option E. Option F is incorrect because, while the poem does describe the strength and permanence of the mountains, the line does not suggest that these traits attract the clouds. Option G is incorrect because, while the line states that the highest peaks are "at rest," the mountains mentioned in the poem have already been harmed by human influence and do not remain untamed or untouched. Option H is incorrect because, while pillars are strong and may indicate shelter, there is no suggestion in the line that the mountains are protecting the people. Additionally, this concept is not a theme of the poem.

41. (D) The question asks how the isolation of the word affects the meaning of the poem. The isolation of the word "Uprise" powerfully emphasizes the first stanza's description of the magnificent mountains standing tall above the land below, as expressed in Option D. Option A is incorrect because the word describes the mountains and, therefore, does not create a contrast between the plateau and the city buildings, but rather between the mountains and the plateau. Option B is incorrect because the word contrasts the mountains with the plateau; it does not compare the mountains to the buildings in the city. Option C is incorrect because the first stanza describes the already developed land over which the mountains rise.

42. (G) The question asks how the poet develops the speaker's point of view in the second stanza. In the

EXPLANATIONS OF CORRECT ANSWERS *continued...*

second stanza, the speaker criticizes the destructive actions of “the world” (lines 8 and 10) against the mountains—actions such as tunneling “their granite cliffs” (line 11) and destroying “the lonely fragments of their peace” (line 14)—as described in Option G. Option E is incorrect because the speaker’s descriptions of the mountains’ grandeur mainly occur in the first and third stanzas, while in the second stanza, the speaker focuses on humanity and its negative effect on the mountains. Option F is incorrect because the wording of the second stanza—“makes war” (line 10), “Splits down their shining sides” (line 12), and “Destroys the lonely fragments” (line 14)—communicates the speaker’s position that people’s main impact on the mountains is destructive; the wording does not illustrate different ways people impact the natural environment. Option H is incorrect because no benefit to the mountains is described by the speaker in the second stanza.

43. (D) The question asks for the line from the poem that best supports the idea that people have forfeited natural beauty for profit. Advertisements are often used as a means to gain a profit, as implied by the soap advertisement in line 13 (Option D). Additionally, the word “Plasters,” in line 13, communicates a negative connotation for the use of advertisements on the priceless natural beauty of the mountains, making Option D the correct response. Option A is incorrect because, while city roofs may spoil the natural beauty, they do not directly symbolize financial gain or profit in line 3. Option B is incorrect because, although making a profit might have been the root cause of the damage that was done to the mountains, making war on the mountains is not a direct message about profit or financial gain in line 10. Option C is incorrect because, although tunneling through the mountains affects the natural beauty of the mountains, it does not directly symbolize financial gain or profit in line 11.

44. (F) The question asks for the detail from the poem that reflects the speaker’s view that people often fail to appreciate that which is familiar. Line 9 (Option F) most directly supports this idea by implying that the mountains have been here for so long that people are accustomed to seeing them and no longer appreciate their beauty and value, making Option F the correct response. Option E is incorrect because line 6 describes the mountains’ location, rather than their longevity or familiarity. Option G is incorrect because, in line 12, the mention of harm that has been done to the mountains does not connect to a sense of overfamiliarity. Option H is incorrect because, although line 18 alludes to the longevity of the mountains, it does not connect the

longevity with a sense of overfamiliarity or the failure of people to appreciate the mountains’ worth.

45. (A) The question asks how the details in the third stanza contribute to the development of the theme of the poem. In the third stanza, phrases such as “Wilderness still untamed” (line 17), “time-resisting storm-worn stone” (line 22), and “The mountains swing along” (line 23) convey the message that in spite of the destruction described in the second stanza, the mountains manage to maintain their wild magnificence. This message is communicated in Option A. Option B is incorrect because, while the phrase “Barrier broken down” (line 21) conveys the idea that people can have some effect on the natural landscape, it does not convey how nature affects people. Option C is incorrect because the phrase “those who do not heed” (line 21) implies a choice to damage nature and not a lack of awareness or understanding. Option D is incorrect because the third stanza is not a call to humanity to respect the mountains but a description of the untamed, welcoming mountains and the joy they provide for those who appreciate them.

46. (G) The question asks how the lines help convey the speaker’s point of view. The words “those who do not need / The joy” in lines 21–22 suggest the speaker’s sadness that people do not realize that they are destroying something wonderful and irreplaceable, as expressed in Option G. Option E is incorrect because the word “barrier” (line 21) refers to the speaker’s opinion that the mountains were “spread by Gods” (line 19) and not to an obstacle that the speaker thinks should be removed. Option F is incorrect because, while the lines indicate that people have lost the need to connect with nature, they do not reveal that the speaker thinks that the cause of this loss is busyness. Option H is incorrect because, although the speaker does say that the stone is “time-resisting” (line 22), this belief is only a small detail of the speaker’s point of view.

47. (A) The question asks what the personification in the lines suggests in the poem. Line 25’s use of the word “Welcoming” suggests that the mountains are kind hosts. Lines 23 and 26, with language such as “The mountains swing along” and “The mists that dance and drive before the sun,” imply the carefree nature of the mountains as they resist the destructive work of humanity. Therefore, Option A is correct. Option B is incorrect because the wording in the lines is positive and victorious, with no language to suggest coming destruction. Option C is incorrect because, although the lines mention that “the mountains swing along” (line 23) and “the mists . . . dance” (line 26), the personification is used to describe the

mountains' perseverance, rather than to suggest that the mountains are entertaining others. Option D is incorrect because the lines refer to the joy of the mountains as they "swing along" (line 23) and do not suggest pride.

The Invention of the Telegraph

48. (H) The question asks for the best explanation of how the use of problem-solution in paragraph 2 helps develop the ideas in the passage. Option H is correct because it explains that Morse realized his problem was that he was not knowledgeable enough to continue his experimentation without help, so the solution was to seek help from a colleague. Option E is incorrect because, while the discussion on the ship fascinated Morse and reminded him of the lectures he had attended at Yale College, it was his failed attempts with electricity that caused him to reach out to Gale for help. Option F is incorrect because, while "Morse found when he began to develop his idea that he had little real understanding of the nature of electricity" (paragraph 3), the paragraph does not state that he was discouraged; it was his failed experimentation that resulted in him first realizing that he needed help. Option G is incorrect because the paragraph states that "Morse came to understand how [Faraday's electromagnet] worked," and that understanding is what caused him to think about sending messages over a wire; Also, Morse's difficulty was in understanding the properties of electricity in general once he began his experimentation.

49. (B) The question asks how the use of sequencing, or arranging in chronological order, in paragraph 3 contributes to the overall structure of the passage. Paragraph 3 outlines the information that Gale knew who Henry was ("Well before Morse had his shipboard idea about a telegraph, Henry rang a bell at a distance by opening and closing an electric circuit") and that Gale told Morse. Gale's input was "crucial to Morse's telegraph system," and hiring Vail was an additional and necessary help. Therefore, Option B is correct because the creation of Morse's telegraph involved a series of steps that each built upon earlier ideas and inventions from others, such as Henry, Gale, and Vail. Option A is incorrect because, although the inventions and advancements of others assisted in the development of the telegraph, the passage does not suggest that the other men were attempting to create their own telegraph systems. Option C is incorrect because the only other long-distance communication system mentioned in the passage is the outdated semaphore system discussed in paragraph 1. Option D is incorrect because the telegraph system was in

development for more than ten years because of the lack of funding and the need for further experimentation.

50. (F) The question asks what the words "dramatic" and "spectacularly" convey in the sentence. Morse and Cornell rushed to post the wires overhead, and the "rigid deadline" (paragraph 7) was successfully met. The words have a positive and victorious tone that is consistent with the feeling of wonder that it worked and of celebration that the construction was completed, making Option F correct. Option E is incorrect because, while there may have been some feelings of relief and fulfillment that the lines were in place, the passage does not say so, and instead it focuses on the wonder and joy Morse and Cornell felt overcoming setbacks and completing the construction of Morse's telegraph system. Option G is incorrect because the passage does not share whether Morse or Cornell considered the future possibilities of the telegraph, only that the finished product was "dramatic," implying it was amazing to see. Option H is incorrect because, while the passage later discusses the expansion of overhead wires "up and down the Atlantic coast" and how they "connected the continents of Europe and America" (paragraph 8), there is no evidence shared in the passage that Morse planned to continue his work with electricity.

51. (A) The question asks for support from the passage for the idea that Morse was aware of his limitations. Option A is correct because the sentence from paragraph 2 details the materials with which Morse experimented unsuccessfully before turning to others for assistance. Option B is incorrect because, although the sentence from paragraph 3 notes that Gale provided necessary assistance, it makes no reference to Morse admitting defeat and requesting his help. Option C is incorrect because, although the sentence from paragraph 3 makes it clear that Henry, Gale, and Vail contributed to Morse's success, the sentence does not specifically say that Morse realized that he needed assistance to succeed. Option D is incorrect because the sentence from paragraph 7 refers to Morse seeking help from Ezra Cornell in constructing his system, not in developing a way to make it work.

52. (F) The question asks how a passage section helps convey a central idea of the passage. Paragraph 3 states that "Henry's experiments, Gale's assistance, and, soon after, hiring the young technician Alfred Vail were keys to Morse's success." The level of interest inspired Morse and others to work together to find a way to use electricity to send long-distance messages. Option F is correct; the section helps convey a central idea

EXPLANATIONS OF CORRECT ANSWERS *continued...*

because, overall, the section focuses on what fascinated Morse enough to begin his work and how others were just as interested and willing to work to achieve this goal. Option E is incorrect because, although the word collaborative suggests that multiple people contributed to the telegraph's success, the option does not clarify the research and effort needed in order to understand how to use electricity to send signals. Option G is incorrect because when Morse came to understand how Faraday's electromagnet worked, Morse wondered if it might be possible to send a coded message over a wire, but that thought later evolved into the telegraph only after more research and experimentation. Option H is incorrect because the influence of what Morse learned at Yale was only a minor factor in his development of the telegraph.

53. (B) The question asks how the graph supports the ideas in paragraph 8. The graph shows the number of messages transmitted from 1870 to 1920. In 1920 almost 160 million messages were transmitted, showing a “dramatic”—almost double—increase from 1910, which makes Option B the correct answer. Option A is incorrect because, while it can be implied from the expansion shown on the graph that people possibly welcomed the improvement in long-distance communication, the graph does not state this explicitly. Option C is incorrect because the graph does not show how many people used the telegraph, but rather it shows the number of messages sent. Additionally, paragraph 8 provides no details about hesitation on the part of individuals. Option D is incorrect because, while improvements in recording and interpreting code were made, the graph does not show the effect of this advancement on the speed or number of messages being transmitted.

54. (G) The question asks for the best summary of Morse's efforts to fund the construction of his telegraph system. Option G is correct because it details all the steps that resulted in Morse obtaining the appropriation, or \$30,000 needed. Option E is incorrect because it focuses on what Morse did while his application for the funding was delayed. Option F is incorrect because, while it begins with Morse applying for the grant, it focuses on the process required for the government to approve the appropriation. Option H is incorrect because it relates how Morse worked with others to develop his ideas about the telegraph before applying for funding for its construction.

55. (A) The question asks how the map provides additional support for a central idea of the passage. The map shows the telegraph line crossing continents in 1902, just forty-four years after the first message

was sent in 1858. This is a much greater distance than the first line Morse built between “the Supreme Court chamber of the Capitol building and the railroad station in Baltimore” (paragraph 7), making Option A correct. Option B is incorrect because the map shows the distance the line covers; it does not indicate Morse's lack of foresight in seeking patents only in North America. Option C is incorrect because, while Gale's advice was crucial to Morse's success, the map shows the physical line stretching across continents many years later, after their initial work. Option D is incorrect because, while it can be inferred that the telegraph had influence across the world, the amount of influence cannot be determined.

56. (E) The question asks for information that conveys the idea that the United States was mostly unaware of the possibilities of electricity in the mid-nineteenth century. The passage states that most signaling systems at the time were “visual or ‘semaphore’ systems using flags or lights” (paragraph 1) and that the United States was looking for “just such a system along its entire Atlantic coast” (paragraph 1). Option E is correct because waving lights and flags reveals how limiting and simple the system of the time was, and Option E states that the United States wanted to expand this system, not improve upon it. Option F is incorrect because the delay in funding had to do with the Panic of 1837 and the “long depression” (paragraph 5), not because the House of Representatives was not aware or ready for innovation in the use of electricity. Option G is incorrect because it focuses on what prompted Morse to consider an electronic wire-based communications system. Option H is incorrect because it describes a basic aspect of an early electrical discovery that demonstrated the interest of scientists in the possibilities of electricity, not the United States as a whole.

57. (D) The question asks which statement best represents a viewpoint held by the author of the passage. Paragraph 8 states that “Telegraph lines soon extended westward, and within Morse's own lifetime they connected the continents of Europe and America.” Therefore, Option D is correct because the author presents Morse's telegraph as a great leap in the ability to quickly communicate messages over distances never before imagined. Option A is incorrect because the author explains that the aboveground wiring was used only because “Cornell suggested that [it was] the fastest and cheapest way” (paragraph 7), not because it would be more successful. Option B is incorrect because the author conveys the importance of this advancement in communication without providing detailed information about electrical systems. Option C is incorrect because,

while the Panic of 1837 caused a delay in Morse's funding, the author shows that Morse received the appropriation in 1843 and was able to overcome the financial setback he faced.

58. (120) There are 5 choices for the first digit, 4 choices for the second digit, 3 choices for the third digit, 2 choices for the fourth digit, and 1 choice for the final digit. The total number of possibilities is $5 \times 4 \times 3 \times 2 \times 1 = 120$.

59. (3)
$$\frac{147-x}{12} = 12$$
$$147 - x = 144$$
$$x = 3$$

60. (-3.4)
$$|(-6) - (-5) + 4.2| - |3 - 9.6| = |3.2| - |-6.6|$$
$$= 3.2 - 6.6 = -3.4$$

61. (300) Let x be the total number of pages in the workbook. Then, 20% of x is 60. Set up a proportion and solve for x :

$$\frac{20}{100} = \frac{60}{x}$$

$$20x = 6,000$$

$$x = \frac{6,000}{20} = 300 \text{ pages}$$

62. (65) Call the missing angle in the top half of the figure x . The sum of the four angles on the top of the figure is equal to 180° .

$$x + y + 30 + 60 = 180$$

Since x is a vertical angle with the 25° angle, then x is also 25° . Use that to solve for y .

$$25 + y + 30 + 60 = 180$$

$$y + 115 = 180$$

$$y = 65$$

63. (D)
$$x(x - 2y) = 9[9 - 2(-7)] = 9(9 + 14)$$
$$= 9(23) = 207$$

64. (E) Find the missing angle, angle QPT, of triangle PQT: $180^\circ - 70^\circ - 50^\circ = 60^\circ$

In parallelogram PQRS, angle QPT is congruent to angle QRS, so the measure of angle QRS is also 60° .

65. (D) Break the equations apart to each equal M :

$$M = 3N$$

$$M = \frac{P}{4}$$

$$M = Q + 5$$

$$M = \frac{R}{7}$$

Pick a number to substitute into the equations, and solve the equations to find the values of M , N , P , Q , and R .

Let $M = 2$. Since all the equations are equal to 2, substitute 2 to find each variable.

$$M = 3N$$

$$2 = 3N$$

$$\frac{2}{3} = N$$

$$M = \frac{P}{4}$$

$$2 = \frac{P}{4}$$

$$8 = P$$

$$M = Q + 5$$

$$2 = Q + 5$$

$$-3 = Q$$

$$M = \frac{R}{7}$$

$$2 = \frac{R}{7}$$

$$14 = R$$

Variable R has the greatest value.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

66. (G) Set up a proportion:

$$\frac{x}{416} = \frac{3}{96}$$

$$96x = 1,248$$

$$x = 13 \text{ bundles}$$

67. (C) Set up an inequality to compare the costs:

$$0.15x \leq 10.50$$

$$x \leq 70$$

Therefore, 70 individual sheets of paper would cost \$10.50, so 69 is the greatest number of individual sheets of paper that Macie can buy that would be less expensive than the package.

68. (F) 7:00 p.m. is 6 hours after 1:00 p.m. Calculate the number of degrees the temperature dropped in 6 hours: $3 \times 6 = 18$ degrees.

Subtract that from the starting point (8 degrees) to find the solution:
 $8 - 18 = -10$ degrees.

69. (D) The ratio of red to blue to green is 15:7:3.

Find the proportion of blue marbles. Add the numbers of the ratio and use the total

sum as the denominator: $\frac{7}{15+7+3} = \frac{7}{25}$.

Find the proportion of green marbles: $\frac{3}{25}$.

Since there are a total of 75 marbles, the number of blue marbles is $\frac{7}{25} \times 75 = 21$.

The number of green marbles is

$$\frac{3}{25} \times 75 = 9. \text{ The number of red marbles is}$$

$$75 - 21 - 9 = 45.$$

If 2 blue marbles are removed and replaced with 2 green marbles, the number of blue marbles is now 19 and the number of green marbles is now 11. The ratio of red marbles to green marbles is 45:11.

70. (F) The total number of desserts ordered is

$$42 + 23 + 47 + 48 = 160.$$

The probability that ice cream was chosen is

$$\frac{48}{160} = \frac{3}{10} = 30\%.$$

71. (C) Since 18 and 24 are both multiples of 6, find the least common multiple of only 18 and 24.

Multiples of 18: 18, 36, 54, 72...

Multiples of 24: 24, 48, 72...

The least common multiple of 6, 18, and 24 is 72.

72. (F) Let x be the number of dozens of eggs for 300 customers. Set up a proportion:

$$\frac{x}{300} = \frac{15}{200}$$

$$200x = 4500$$

$$x = 22.5 \text{ dozen eggs.}$$

Round up to 23 because you can't have half an egg.

73. (C) The total number of bottles of juice in the cooler is $5 + 3 + 6 = 14$.

The number of bottles of juice that are not apple juice (grape juice and orange juice) is $3 + 6 = 9$.

So the probability is $\frac{9}{14}$.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

- 74. (H)** The radius of the large plate is 20 cm. Use that to find the area of the large plate:

$$A = \pi r^2 = \pi(20^2) = 400\pi \text{ sq cm}$$

The circumference of the smaller plate is 20π cm. Use that to find the radius, and then the area, of the smaller plate:

$$C = 2\pi r$$

$$20\pi = 2\pi r$$

$$r = 10$$

$$A = \pi r^2 = \pi(10^2) = 100\pi \text{ sq cm}$$

Subtract the area of the small plate from the area of the large plate:

$$400\pi - 100\pi = 300\pi \text{ sq cm}$$

- 75. (D)** The question says that an equal number (x) of each type of page space was purchased. To find the number of each type of page space that was purchased, multiply the price per type by x and set it equal to the total amount spent, then solve for x :

$$200x + 350x + 600x = 11,500$$

$$1,500x = 11,500$$

$$x = 10$$

Thus, the store purchased 10 units of each type of page space. To find the total **amount** of page space purchased, multiply each type of page space by 10, and add:

$$\begin{aligned} & \left(10 \times \frac{1}{4} \text{ page}\right) + \left(10 \times \frac{1}{2} \text{ page}\right) + (10 \times 1 \text{ page}) \\ &= 17\frac{1}{2} \text{ pages} \end{aligned}$$

- 76. (F)** Solve the inequality for x .

$$3x + 8 \leq 92$$

$$3x \leq 84$$

$$x \leq 28$$

The **positive** odd numbers less than 28 are 1, 3, 5, ..., 25, and 27. There are 14 of them.

- 77. (A)** Substitute 3 for y and solve for x :

$$\frac{36}{y} = 4x$$

$$\frac{36}{3} = 4x$$

$$12 = 4x$$

$$3 = x$$

- 78. (H)** Since $\overline{XY} = 20$ cm, use that to find \overline{YZ} :

$$\overline{YZ} = \frac{3}{5}\overline{XY} = \frac{3}{5}(20) = 12 \text{ cm}$$

$$\overline{XZ} = \overline{XY} + \overline{YZ} = 20 + 12 = 32 \text{ cm}$$

- 79. (C)** Calculate the cost of the cloth before tax:

$$1\frac{3}{4} \times 8 = \frac{7}{4} \times 8 = \$14$$

Now find the tax for \$14 worth of cloth:

$$14 \times 8\% = 14 \times \frac{8}{100} = \$1.12$$

Finally, add the cost of the fabric and the tax:

$$\$14 + \$1.12 = \$15.12$$

- 80. (F)** To find M , subtract $N - M$ and set it equal to the length:

$$1\frac{1}{3} - M = 5\frac{5}{6}$$

$$-M = 5\frac{5}{6} - 1\frac{1}{3}$$

$$-M = 5\frac{5}{6} - 1\frac{2}{6}$$

$$-M = 4\frac{3}{6}$$

$$M = -4\frac{1}{2}$$

EXPLANATIONS OF CORRECT ANSWERS *continued...*

- 81. (B)** Add the four values in the ratio ($177 + 12 + 7 + 4 = 200$) and use the sum as the denominator. Use that to find the fraction of zinc in one of the coins. Then reduce the fraction:

$$\frac{12}{200} = \frac{3}{50}$$

Multiply this fraction by 8 to find the number of grams of zinc in decimal form:

$$\frac{3}{50} \times 8 = \frac{24}{50} = 0.48 \text{ g}$$

- 82. (G)** Jack scored a mean of 15 points per game in each of the first 3 games, so he earned a total of 45 points for the first 3 games. Use that information to calculate the mean over the four games:

$$\frac{45 + 27}{4} = \frac{72}{4} = 18$$

- 83. (B)** Find the number of liters that need to be added. Since $\frac{1}{3}$ of the oil drum is full, $\frac{2}{3}$ of the drum remains empty:

$$\frac{2}{3} \times 4,320 = 2,880 \text{ liters}$$

Use the conversion $1 \text{ kL} = 1,000 \text{ L}$ to find the number of kL:

$$\frac{2,880}{1,000} = 2.88 \text{ kL}$$

- 84. (F)** First, find out how old Nicole and Carmen are now.

Let N = Nicole's age now.

Let C = Carmen's age now.

$$C + 2 = 17$$

$$C = 15 \text{ (Carmen's age now)}$$

$$N = 3C$$

$$N = 3(15) = 45 \text{ (Nicole's age now)}$$

$$N - 5 = 45 - 5 = 40 \text{ (Nicole's age 5 years ago)}$$

- 85. (C)** Let x be the original amount of the chemical. It loses 20% after each week, which means 80% of the chemical remains at the end of each week.

End of first week: $0.80x$

At the end of the second week, 80% of the amount left at the end of the first week remains.

End of second week:

$$0.80(0.80x) = 0.64x \text{ or } 64\%$$

- 86. (G)** One more than an odd integer must be even.

One more than $w - 1$ is w , therefore w must be even. Two times an even integer must be even, therefore $2w$ is even. An even integer decreased by 2 must be even.

Therefore, $2w - 2$ must be even.

- 87. (B)** Find the least common multiple of 2, 3, and 4 — which is 12. So, it takes 12 minutes before all three are back at the starting line. Ann completes 1 lap every 2 minutes, so in 12 minutes she has completed 6 laps.

88. (F) $4(7 - 3x) - (5 - x) = 28 - 12x - 5 + x$
 $= 23 - 11x$

- 89. (D)** First, add the number of students for each category to find out how many total students were in the survey: $12 + 16 + 7 + 5 = 40$

The number of students who had at least 2 pets are the ones who have 2 pets (7) plus the ones who have 3 or more (5). The total number of students with at least 2 pets is $7 + 5 = 12$.

The probability of a student in the survey having at least two pets is:

$$\frac{12}{40} = \frac{3}{10}$$

EXPLANATIONS OF CORRECT ANSWERS *continued...*

90. (E) Let x be the total number of liters the container can hold.

$$\frac{n+10}{x} = 60\% \text{ and } \frac{n+16}{x} = 75\%$$

First, solve each equation for x :

Equation 1:

$$\frac{n+10}{x} = \frac{60}{100}$$

$$\frac{n+10}{x} = \frac{3}{5}$$

$$3x = 5(n + 10)$$

$$x = \frac{5n+50}{3}$$

Equation 2:

$$\frac{n+16}{x} = \frac{75}{100}$$

$$\frac{n+16}{x} = \frac{3}{4}$$

$$3x = 4(n + 16)$$

$$x = \frac{4n+64}{3}$$

Now, set the two equations equal to each other and solve for n .

$$\frac{5n+50}{3} = \frac{4n+64}{3}$$

$$5n + 50 = 4n + 64$$

$$n + 50 = 64$$

$$n = 14 \text{ liters}$$

91. (B) $5x^3 + 3x + 9 + \frac{1}{x^2}$

$$= 5(10^3) + 3(10) + 9 + \frac{1}{10^2}$$

$$= 5,000 + 30 + 9 + \frac{1}{100} = 5,039.01$$

92. (E) The length of one side of the square is 6 cm. Since R, S, and T are midpoints, then \overline{TM} , \overline{MR} , \overline{RN} , and \overline{NS} are all equal to 3 cm. Triangles TMR and RNS are both right triangles, so the area of one of the triangles is $\frac{1}{2} \times 3 \times 3 = \frac{9}{2}$. The triangles are congruent, so the sum of the areas is $\frac{9}{2} + \frac{9}{2} = 9$ sq cm.

93. (D) Let x be the amount spent on planned expense in one year:

$$\frac{x}{29,600} = \frac{5}{8}$$

$$x = \frac{5}{8}(29,600) = 18,500$$

94. (G) First, figure out how many different topping pairs are possible. Use 1, 2, 3, 4, 5, 6, 7 to represent the toppings and create a list of possible pairs:

1,2; 1,3; 1,4; 1,5; 1,6; 1,7

2,3; 2,4; 2,5; 2,6; 2,7

3,4; 3,5; 3,6; 3,7

4,5; 4,6; 4,7

5,6; 5,7

6,7

So there are 21 different topping combinations for one pizza.

Since there are 3 pizza sizes, multiply the total number of combinations by 3 to get the total number of different pizzas Cody can create: $3 \times 21 = 63$.

95. (D) To find by what percent the number of families with 1 cat is greater than the number of families with 2 cats, calculate the difference between the two numbers and divide by the number of families with 2 cats:

$$\frac{42-35}{35} = \frac{7}{35} = \frac{1}{5} = 0.20 \text{ or } 20\%.$$

96. (H) One side of the square base is 3 ft long. Since the height of the box is 3 times the length, then the height is $3 \times 3 = 9$ ft. The volume of a rectangular prism is length \times height \times width. The volume of the wooden box is

$$V = 3 \times 3 \times 9 = 81 \text{ cu ft.}$$

97. (B) Calculate each mean speed:

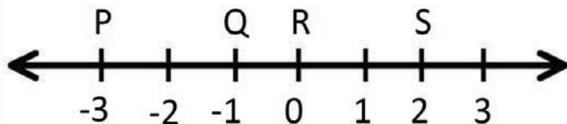
$$R = \frac{65}{5} = 13 \text{ kph}$$

$$S = \frac{72}{4} = 18 \text{ kph}$$

Then calculate the difference of both mean speeds:

$$S - R = 18 - 13 = 5 \text{ kph}$$

98. (G)



Find the midpoint of PQ and RS:

$$\text{Midpoint of PQ} = \frac{-1 - (-3)}{2} = \frac{2}{2} = 1 \text{ unit.}$$

The midpoint of PQ is located 1 unit from each endpoint, so the midpoint is at -2 .

$$\text{Midpoint of RS} = \frac{2 - 0}{2} = \frac{2}{2} = 1 \text{ unit.}$$

The midpoint of RS is located 1 unit from each endpoint, so the midpoint is at 1 .

The distance between the two midpoints is $1 - (-2) = 3$ units.

99. (D) If 1 L = 1,000 cu cm, then 1 L = 1,000 mL. Set up a proportion, letting x = the amount of cubic millimeters in 1,000 cubic centimeters.

$$\frac{1,000 \text{ cu mm}}{1 \text{ L}} = \frac{x \text{ cu mm}}{1,000 \text{ cu mm}}$$

Solve for x : 1,000,000 cubic millimeters are in 1,000 cubic centimeters.

100. (E) Both $x + 1$ and $y + 2$ are radii. So, set them equal to each other and solve for y .

$$y + 2 = x + 1$$

$$y = x - 1$$

101. (C) There are 5 sections between M and T. To find the length of one of these sections, find the distance between M and T and divide by 5:

$$\left(\frac{5}{8} - \left(-\frac{1}{4} \right) \right) \div \frac{5}{1} =$$

$$\left(\frac{5}{8} + \frac{2}{8} \right) \div \frac{5}{1} =$$

$$\frac{7}{8} \div \frac{5}{1} = \frac{7}{8} \times \frac{1}{5} = \frac{7}{40}$$

R is 3 sections away from M, so add:

$$-\frac{1}{4} + 3\left(\frac{7}{40} \right) = -\frac{10}{40} + \frac{21}{40} = \frac{11}{40}$$

R is located at $\frac{11}{40}$.

102. (H) Let x be the number of minutes Phan used his internet service in the month. Phan's monthly charges were $18 + 0.024x$. Since Deion's charges were the same as Phan's, set the expression equal to 30 and solve for x :

$$18 + 0.024x = 30$$

$$0.024x = 12$$

$$x = 500$$

Phan used his service for 500 minutes.

EXPLANATIONS OF CORRECT ANSWERS *continued...*

103. (B) Create a chart using the given information and use subtraction to figure out how many cars are not red **and** do not have a back-up camera:

	Red	Not Red	TOTAL
Back-up Camera	4	6 (10-4)	10
No back-up Camera		32 (38-6)	
TOTAL	12	38 (50-12)	50

The probability of selecting a car that meet both conditions from the total of 50 cars at the dealership is $\frac{32}{50} = \frac{16}{25}$.

104. (E) $0.06 = \frac{6}{100}$. Simplify the fraction to find the answer:

$$\frac{6}{100} = \frac{3}{50} \text{ so, } x = 3.$$

105. (C) The height of the triangle is 4 units. The length of the base is $n - m$. So the area is

$$A = \frac{1}{2}(n - m)(4) = 2(n - m).$$

106. (F) The total number of cards in the box is $8 + 6 + 5 + 4 + 1 = 24$. Set up a proportion to figure out which card has exactly a 1 in 4 chance of being picked at random. $\frac{x}{24} = \frac{1}{4}$ or $x = 6$. The dog card has a 1 in 4 chance of being randomly selected.

107. (C) Separate the compound inequality into two pieces:

$$2x - 2 \leq y \text{ and } y \leq 4x + 10$$

Substitute $y = 1$ into each inequality and solve for x :

$$2x - 2 \leq 1$$

$$2x \leq 3$$

$$x \leq \frac{3}{2}$$

$$1 \leq 4x + 10$$

$$-9 \leq 4x$$

$$-\frac{9}{4} \leq x$$

The solution is the number line that shows that x is greater than or equal to $-2\frac{1}{4}$ and less than or equal to $1\frac{1}{2}$.

108. (G) $\frac{14}{21} = \frac{p}{7}$

$$21p = 7(14)$$

$$21p = 98$$

$$p = \frac{98}{21} = \frac{14}{3}$$

109. (A) The total number of balls in the box is $7 + 14 + 21 = 42$.

The probability that the ball is black is

$$\frac{7}{42} = \frac{1}{6}.$$

EXPLANATIONS OF CORRECT ANSWERS *continued...*

110. (G) None of the 80 students ($800 - 720$) who answered “no” to Question A ($800 - 720$) could have answered “yes” to both questions. Therefore, the least possible number of students who could have answered “yes” to both questions, can be found by subtracting the 80 who answered “no” to Question A from the 640 who answered “yes” to Question B or $640 - 80 = 560$.

111. (A) Raoul is at least 3 years older than Vahn, which can be written as

$$r \geq v + 3$$

Rewrite this inequality to match the answer options:

$$r - v \geq 3$$

112. (F) Since 5.6 ricks and 12.88 dalts are both equal to 1 sind, then $5.6 \text{ ricks} = 12.88 \text{ dalts}$. To calculate the number of dalts (d) in 1 rick, set up a proportion:

$$\frac{5.6}{12.88} = \frac{1}{d}$$

$$5.6d = 12.88$$

$$d = 2.3$$

113. (D) The shelf, when full, holds 36 cans. When the shelf is half full, it holds 18 cans.

$$x - 4 = 18$$

$$x = 22$$

114. (G) The probability of the cup landing on its side is 72%. Carlos tossed the cup a total of 200 times ($50 + 150$). The number of times the cup lands on its side is 72% of 200:
 $0.72 \times 200 = 144$.

Answer Key for Sample Form B

1. B	13. B	25. D	37. D	49. B	61. 300	73. C	85. C	97. B	109. A
2. E	14. F	26. G	38. F	50. F	62. 65	74. H	86. G	98. G	110. G
3. C	15. D	27. C	39. B	51. A	63. D	75. D	87. B	99. D	111. A
4. G	16. G	28. E	40. E	52. F	64. E	76. F	88. F	100. E	112. F
5. A	17. C	29. D	41. D	53. B	65. D	77. A	89. D	101. C	113. D
6. H	18. H	30. F	42. G	54. G	66. G	78. H	90. E	102. H	114. G
7. A	19. B	31. A	43. D	55. A	67. C	79. C	91. B	103. B	
8. G	20. H	32. E	44. F	56. E	68. F	80. F	92. E	104. E	
9. B	21. A	33. B	45. A	57. D	69. D	81. B	93. D	105. C	
10. H	22. H	34. E	46. G	58. 120	70. F	82. G	94. G	106. F	
11. A	23. A	35. B	47. A	59. 3	71. C	83. B	95. D	107. C	
12. E	24. G	36. H	48. H	60. -3.4	72. F	84. F	96. H	108. G	

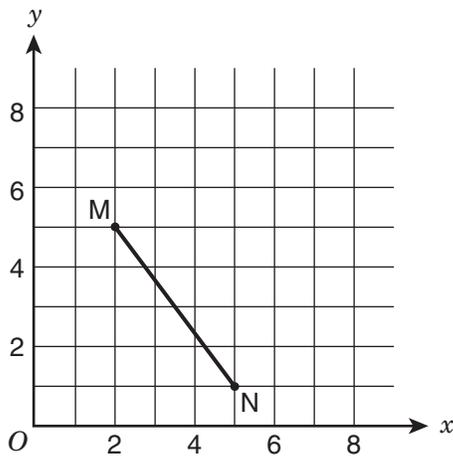
SAMPLE QUESTIONS FOR GRADE 9 MATHEMATICS

DIRECTIONS: This section provides sample mathematics questions for the Grade 9 test forms. General directions for how to answer math questions are located on pages 81 and 152. There is no sample answer sheet for this section; mark your answers directly on this page or on a separate piece of paper.

1. Assume $S(x)$ equals the sum of all positive even integers less than or equal to x . What is the value of $S(7)$?

2. $\sqrt{16} \cdot \sqrt{196} =$

3.



If \overline{MN} is translated 1 unit to the left to produce $\overline{M'N'}$, what is the area of parallelogram $NMM'N'$?

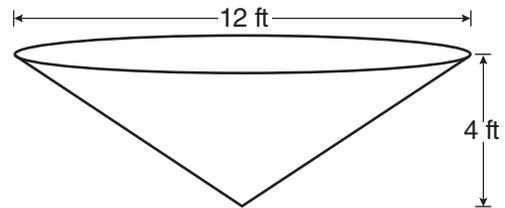
- A. 3 square units
- B. 4 square units
- C. 5 square units
- D. 6 square units

4. Simplify:

$$\frac{p^{12} \cdot p^0}{p^{-4}}$$

- E. 0
- F. p^{-3}
- G. p^8
- H. p^{16}

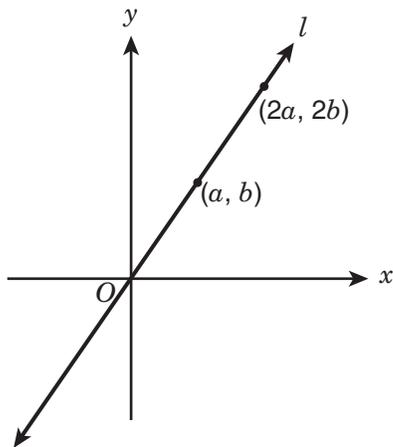
5.



Water is pumped into a tank that is shaped like the right inverted cone shown above. The cone has a base diameter of 12 feet and a height of 4 feet. What is the volume, in cubic feet, of the water in the tank when the height of the water is 2 feet?

- A. 6π cu ft
- B. 18π cu ft
- C. 24π cu ft
- D. 48π cu ft

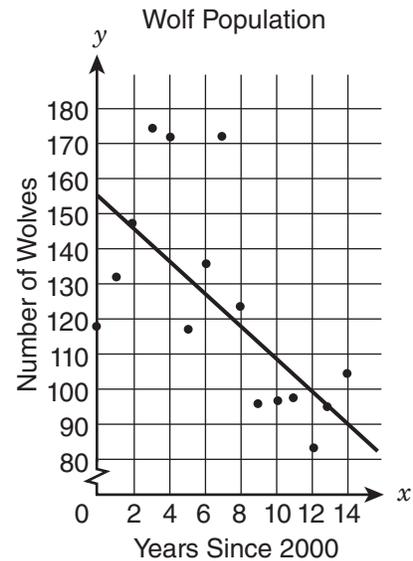
6.



Straight line l passes through the origin, as shown in the figure above. What is the slope of line l in terms of a and b ?

- E. $\frac{a}{b}$
- F. $\frac{2b}{a}$
- G. $\frac{2a}{b}$
- H. $\frac{b}{a}$

7. The graph shows the wolf population in Yellowstone National Park since 2000. A student drew a line of best fit to model the data.

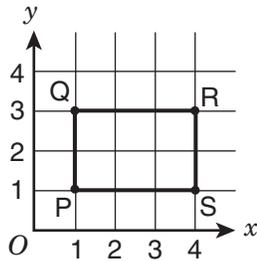


Which statement best describes the line of best fit that the student drew?

- A. The line of best fit is not a strong model for the data, because the points are not close to the line.
- B. The line of best fit is not a strong model for the data, because it does not pass through any of the data points.
- C. The line of best fit is a strong model for the data, because both the line and the data show a negative trend.
- D. The line of best fit is a strong model for the data, because about half the data points are on each side of the line.

8. To determine the price of servicing a car, a mechanic charges a fixed fee plus an hourly rate for each hour he works. If his price for 4 hours of service is \$270, and his price for 7 hours of work is \$420, what is the fixed fee that the mechanic charges?
- E. \$50
 F. \$60
 G. \$70
 H. \$120

9.



Rectangle PQRS above is rotated 180° about the origin to form rectangle $P'Q'R'S'$. What are the coordinates of R' ?

- A. (4, -3)
 B. (-4, 3)
 C. (-4, 1)
 D. (-4, -3)

10.
$$\frac{15.3 \times 10^{-8}}{1.5 \times 10^4}$$

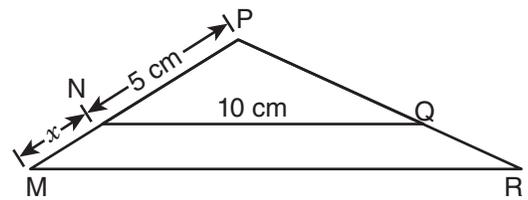
What is the quotient of the expression above, expressed in scientific notation?

- E. 1.02×10^{-13}
 F. 1.02×10^{-11}
 G. 1.02×10^{-4}
 H. 1.02×10^{12}

11. Which of the following expressions is **negative** in value?

- A. $4 - \pi$
 B. $3\pi - 9$
 C. $12 - 4\pi$
 D. $36 - 9\pi$

12.



In the figure above, $\triangle MPR$ is similar to $\triangle NPQ$. If the length of \overline{NQ} is 10 centimeters, what is the length of \overline{MR} in terms of x ?

- E. $2x$
 F. $2x + 10$
 G. $x + 5$
 H. $\frac{1}{2}x + 5$

13. The symbol $\langle x, y, z \rangle$ means $\frac{xz + xy}{2} + zy$. What is the value of $\langle 3, 4, 8 \rangle$?

- A. 15
 B. 34
 C. 50
 D. 56

1. (12) $S(x)$ is the sum of all positive even integers less than or equal to x . 1, 2, 3, 4, 5, and 6 are all integers less than 7. Take the positive integers from the list and find the sum:

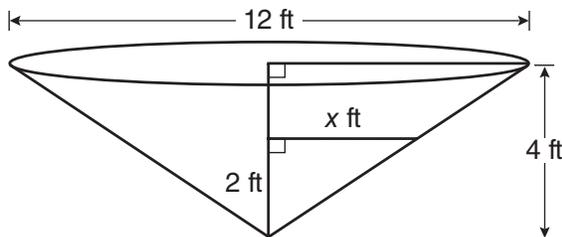
$$S(7) = 2 + 4 + 6 = 12$$

2. (56) $\sqrt{16} \cdot \sqrt{196} = 4 \cdot 14 = 56$

3. (B) When \overline{MN} is translated 1 unit left, the distance between M' and M is 1 unit, which is the base of the parallelogram. The height of the parallelogram is the vertical distance from M to N . Since M is at $y = 5$ and N is at $y = 1$, the height is $5 - 1 = 4$ units. The area of a parallelogram is base \times height, so the area is $1 \times 4 = 4$ square units.

4. (H) $\frac{p^{12} \cdot p^0}{p^{-4}} = (p^{12} \cdot p^0) \frac{p^4}{1} = p^{(12+0+4)} = p^{(12+4)} = p^{16}$

5. (A) First, find the radius when the depth of the water is 2 ft. Set up two similar right triangles as shown below:



Use a proportion to find x . Since the diameter of the right inverted cone is 12 ft, the radius is 6 ft:

$$\frac{x}{6} = \frac{2}{4}$$

$$x = 3 \text{ ft}$$

Now, find the volume of the cone with a radius of 3 ft and a height of 2 ft:

$$V = \frac{1}{3}r^2\pi h = \frac{1}{3}(3^2)\pi(2) = 3\pi(2) = 6\pi$$

6. (H) Use the slope formula to figure out the slope of line l .

$$\text{Slope of line } l = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2b - b}{2a - a} = \frac{b}{a}$$

7. (A) The line of best fit should be close to as many points as possible. In this case, very few of the points are on or next to the line. So, this is not a strong model for the data, because most of the points are not close to the line.

8. (G) Set up the two equations and subtract them from one another to find the price per hour:

$$y + 7x = 420$$

$$- y + 4x = 270$$

$$3x = 150$$

$$x = 50$$

To find the fixed fee, use one of the equations

($y + 7x = 420$ or $y + 4x = 270$) and solve for y , using $x = 50$.

$$y + 4x = 270$$

$$y + 4(50) = 270$$

$$y + 200 = 270$$

$$y = 70$$

9. (D) Point R is at $(4, 3)$. If (x, y) is rotated 180° about the origin: $R(x, y) \rightarrow (-x, -y)$. Therefore, $R(4, 3) \rightarrow (-4, -3)$.

10. (F) $\frac{15.3 \times 10^{-8}}{1.5 \times 10^4} = \left(\frac{15.3}{1.5}\right) \times \frac{10^{-8}}{10^4} =$

$$10.2 \times \frac{10^{-8}}{10^4}$$

Then use the rule of exponents to simplify.

$$10.2 \times 10^{(-8-4)} = 10.2 \times 10^{-12}$$

Rewrite the answer so that it is standard scientific notation form.

$$1.02 \times 10^{-11}$$

- 11. (C)** Substitute the approximation $\pi = 3.14$ into each expression and solve to find which expression results in a negative value:

$$4 - \pi = 0.86$$

$$3\pi - 9 = 0.42$$

$$12 - 4\pi = -0.56$$

$$36 - 9\pi = 7.74$$

So, the answer is $12 - 4\pi$.

- 12. (F)** Triangles NPQ and MPR are similar, so corresponding sides of the triangles are proportional. Set up a proportion to find \overline{MR} .

$$\frac{\overline{MR}}{\overline{MP}} = \frac{\overline{NQ}}{\overline{NP}}$$

$$\frac{\overline{MR}}{x + 5} = \frac{10}{5}$$

$$5(\overline{MR}) = 10(x + 5)$$

$$5(\overline{MR}) = 10x + 50$$

$$\overline{MR} = 2x + 10$$

- 13.** In this problem, $x = 3$, $y = 4$, and $z = 8$. Substitute those values into the given equation and simplify.

$$\frac{(3 \cdot 8) + (3 \cdot 4)}{2} + (8 \cdot 4) =$$

$$\frac{24 + 12}{2} + 32 =$$

$$\frac{36}{2} + 32 =$$

$$18 + 32 = 50$$

Answer Key for Grade 9 Mathematics

- | | | |
|-------|-------|-------|
| 1. 12 | 6. H | 11. C |
| 2. 56 | 7. A | 12. F |
| 3. B | 8. G | 13. C |
| 4. H | 9. D | |
| 5. A | 10. F | |

SAMPLE PROBLEMS FOR GRID-IN QUESTIONS

DIRECTIONS: Solve each question. In the grids provided below each question, 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, 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.**

1. On a practice test, there are 3 essay questions for every 7 multiple-choice questions. If there are a total of 420 questions on this test, how many of those are essay questions?

-
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

3.
$$\frac{0.21}{0.33} = \frac{x}{1.10}$$

What is the solution to the equation above?

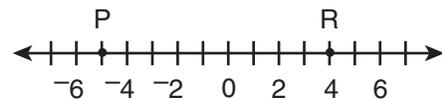
-
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

2. $|19 - 21| + |1.9 - 2.1| - x = 10$

In the equation above, what is the value of x ?

-
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

- 4.



Point Q is to be placed on the number line one-third of the distance between Point P and Point R. What number will be at the midpoint of segment PQ?

-
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

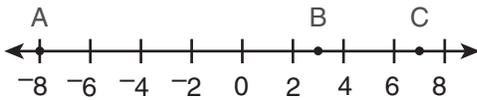
5. How many ways can the letters in the word RAIN be arranged horizontally so that the vowels (A and I) are always immediately next to each other (either AI or IA)?

-
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. A box contains 11 marbles: 7 red and 4 green. Five of these marbles are removed at random. If the probability of drawing a green marble is now 0.5, how many red marbles were removed from the box?

-
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

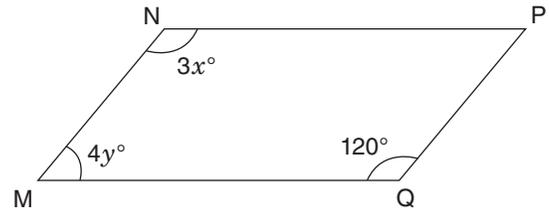
- 6.



On the number line above, D (not shown) is the midpoint of \overline{AB} , and E (not shown) is the midpoint of \overline{BC} . What is the midpoint of \overline{DE} ?

-
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

- 8.



MNPQ is a parallelogram. The measure of $\angle MQP$ is 120° . What is the value of $x + y$?

-
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

9. Maria is now 16 years old. In 6 years, she will be twice as old as her brother will be at that time. How old is her brother now?

-
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

10. $\frac{4.5}{0.1} \times 0.22 =$

-
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

EXPLANATION OF CORRECT ANSWERS GRID-IN QUESTIONS

DIRECTIONS: When filling out the answer grid, remember that each column should contain **ONLY** one symbol/one digit. When filling out the circles, only fill in one circle to **MATCH** the symbol or digit at the top of the column.

1. (126) There are 3 essay questions for every 7 multiple-choice questions, for a total of 10 questions. The proportion of essay questions is $\frac{3}{10}$. Multiply the fraction of essay questions by 420 to find the total number of essay questions: $420 \times \frac{3}{10} = \frac{1260}{10} = 126$

Since the answer is a positive whole number, skip the first column and begin inputting the digits to the answer in the second column on the left-hand side.

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

2. (-7.8) $|19 - 21| + |1.9 - 2.1| - x = 10$
 $|-2| + |-0.2| - x = 10$
 $2 + 0.2 - x = 10$
 $x = -7.8$

Since the answer is a negative, begin filling out the grid with the negative sign. The answer contains a negative sign, a whole number, a decimal point, and a digit in the tenths place. Each part of the answer, including the decimal point, should be placed in a separate column, with no blank spaces between them.

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

3. (0.7) $\frac{0.21}{0.33} = \frac{x}{1.10}$

Multiply the numerators and denominators of all the fractions by 100 to eliminate the decimals:

$$\frac{21}{33} = \frac{100x}{110}$$

Simplify the fractions:

$$\frac{7}{11} = \frac{10x}{11}$$

$$7(11) = 10x(11)$$

$$7 = 10x$$

$$x = \frac{7}{10} = 0.7$$

Since the answer is a positive decimal, skip the first column and place the zero in the second column on the left-hand side.

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

4. (-2) First, find the length of \overline{PR} : $4 - (-5) = 9$ units

Point Q is located $\frac{1}{3}$ of the way from P to R , so calculate where that point would be:

$$9 \times \frac{1}{3} = 3 \text{ units}$$

So, point Q is located at $4 - 3 = 1$. Finally, calculate the midpoint of \overline{PQ} :

$$\text{Midpoint } \overline{PQ} = \frac{-5+1}{2} = -2$$

Since the answer is a negative single-digit, fill in the negative sign and the second column contains the digit, 2.

-	2			
●	⊙	⊙	⊙	⊙
	0	0	0	0
	1	1	1	1
	2	2	2	2
	3	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

5. (12) There are three positions for the letters AI in the four letter combinations:

AI __, _AI __, and __AI

For each of those positions of A and I, there are two combinations of the letters R and N: AIRN, AINR, RAIN, NAIR, RNAI, NRAI. Thus, for the letters AI (in that order), there is a total of 6 combinations. The question indicates that IA is also possible, so there are also 6 combinations with the letters in the order IA. The total number of combinations is $6 + 6 = 12$.

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

6. (1.25) Calculate the midpoints of \overline{AB} and \overline{BC} to find the locations of D and E, respectively:

Find the midpoint for \overline{AB} (Point D):

$$D = \frac{-8+3}{2} = \frac{-5}{2} = -2.5$$

Find the midpoint for \overline{BC} (Point E):

$$E = \frac{3+7}{2} = 5$$

Now, find the midpoint of \overline{DE} :

$$\frac{-2.5+5}{2} = \frac{2.5}{2} = \frac{5}{4} = 1.25$$

Since the answer is a positive decimal, skip the first column. The response begins in the second column on the left-hand side.

	1	.	2	5
-
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	●
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

7. (4) There were 11 marbles in the box. After 5 marbles were removed, the total number of marbles in the box is now 6. The probability of drawing a green marble is now $\frac{1}{2}$, which is equivalent to $\frac{3}{6}$, thus, 3 green marbles remain in the box.

Originally, there were 7 red marbles in the box. Since there are now 6 total marbles, there are now 3 red marbles. Meaning 4 red marbles were removed from the box.

Since the answer is a positive single-digit whole number, skip the first column and the response begins on the second left-hand column.

	4			
-
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

8. (55) In a parallelogram, opposite angles are congruent. Since the question states that angle MQP is 120° , then angle MNP must also be 120° . Use this information to find x :

$$3x = 120$$

$$x = 40$$

Adjacent angles in a parallelogram are supplementary (sum of 180°), so the sum of angle MQP and angle NMQ is equal to 180° . Use this information to find y :

$$4y + 120 = 180$$

$$4y = 60$$

$$y = 15$$

The question asks for the value of $x + y$, so

$$x + y = 40 + 15 = 55$$

Since the answer is a positive whole number, skip the first column and begin inputting the digits to the answer in the second column on the left-hand side.

	5	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

9. (5) When Maria is 22, she will be twice as old as her brother.

Let $x =$ the age of Maria's brother when Maria is 22.

$$2x = 22$$

$$x = 11$$

To find Maria's brother's current age, subtract $11 - 6 = 5$.

Maria's brother is currently 5 years old.

Since the answer is a positive single-digit whole number, skip the first column and the response begins in the second left-hand 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

10. (9.9) In order to solve this problem, first convert $\frac{4.5}{0.1}$ to a whole number by multiplying the numerator and denominator by 10 to get

$$\frac{45}{1} \text{ which is } 45.$$

Multiply:

$$45 \times 0.22 = 9.9$$

Since the answer is a positive whole number with a decimal, skip the first column and begin inputting the answer starting in the second column on the left-hand side.

	9	.	9	
-
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

Answer Key for Grid-In Mathematics

- | | |
|---------|---------|
| 1. 126 | 6. 1.25 |
| 2. -7.8 | 7. 4 |
| 3. 0.7 | 8. 55 |
| 4. -2 | 9. 5 |
| 5. 12 | 10. 9.9 |

CONTINUE ON TO THE NEXT PAGE ►

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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 _____

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PART 1 ENGLISH LANGUAGE ARTS

- 1 (A) (B) (C) (D)
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- 3 (A) (B) (C) (D)
- 4 (E) (F) (G) (H)
- 5 (A) (B) (C) (D)
- 6 (E) (F) (G) (H)
- 7 (A) (B) (C) (D)
- 8 (E) (F) (G) (H)
- 9 (A) (B) (C) (D)
- 10 (E) (F) (G) (H)
- 11 (A) (B) (C) (D)
- 12 (E) (F) (G) (H)
- 13 (A) (B) (C) (D)
- 14 (E) (F) (G) (H)
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- 16 (E) (F) (G) (H)
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- 19 (A) (B) (C) (D)
- 20 (E) (F) (G) (H)
- 21 (A) (B) (C) (D)
- 22 (E) (F) (G) (H)
- 23 (A) (B) (C) (D)
- 24 (E) (F) (G) (H)
- 25 (A) (B) (C) (D)
- 26 (E) (F) (G) (H)
- 27 (A) (B) (C) (D)
- 28 (E) (F) (G) (H)
- 29 (A) (B) (C) (D)
- 30 (E) (F) (G) (H)

- 31 (A) (B) (C) (D)
- 32 (E) (F) (G) (H)
- 33 (A) (B) (C) (D)
- 34 (E) (F) (G) (H)
- 35 (A) (B) (C) (D)
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- 37 (A) (B) (C) (D)
- 38 (E) (F) (G) (H)
- 39 (A) (B) (C) (D)
- 40 (E) (F) (G) (H)
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- 46 (E) (F) (G) (H)
- 47 (A) (B) (C) (D)
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- 49 (A) (B) (C) (D)
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- 55 (A) (B) (C) (D)
- 56 (E) (F) (G) (H)
- 57 (A) (B) (C) (D)

PART 2 MATHEMATICS

58

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

59

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

60

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

61

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

62

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

- 63 (A) (B) (C) (D)
- 64 (E) (F) (G) (H)
- 65 (A) (B) (C) (D)
- 66 (E) (F) (G) (H)
- 67 (A) (B) (C) (D)
- 68 (E) (F) (G) (H)
- 69 (A) (B) (C) (D)
- 70 (E) (F) (G) (H)
- 71 (A) (B) (C) (D)
- 72 (E) (F) (G) (H)
- 73 (A) (B) (C) (D)
- 74 (E) (F) (G) (H)
- 75 (A) (B) (C) (D)

- 76 (E) (F) (G) (H)
- 77 (A) (B) (C) (D)
- 78 (E) (F) (G) (H)
- 79 (A) (B) (C) (D)
- 80 (E) (F) (G) (H)
- 81 (A) (B) (C) (D)
- 82 (E) (F) (G) (H)
- 83 (A) (B) (C) (D)
- 84 (E) (F) (G) (H)
- 85 (A) (B) (C) (D)
- 86 (E) (F) (G) (H)
- 87 (A) (B) (C) (D)
- 88 (E) (F) (G) (H)

- 89 (A) (B) (C) (D)
- 90 (E) (F) (G) (H)
- 91 (A) (B) (C) (D)
- 92 (E) (F) (G) (H)
- 93 (A) (B) (C) (D)
- 94 (E) (F) (G) (H)
- 95 (A) (B) (C) (D)
- 96 (E) (F) (G) (H)
- 97 (A) (B) (C) (D)
- 98 (E) (F) (G) (H)
- 99 (A) (B) (C) (D)
- 100 (E) (F) (G) (H)
- 101 (A) (B) (C) (D)

- 102 (E) (F) (G) (H)
- 103 (A) (B) (C) (D)
- 104 (E) (F) (G) (H)
- 105 (A) (B) (C) (D)
- 106 (E) (F) (G) (H)
- 107 (A) (B) (C) (D)
- 108 (E) (F) (G) (H)
- 109 (A) (B) (C) (D)
- 110 (E) (F) (G) (H)
- 111 (A) (B) (C) (D)
- 112 (E) (F) (G) (H)
- 113 (A) (B) (C) (D)
- 114 (E) (F) (G) (H)

