

# Specialized High Schools Student Handbook

Admissions Information and Sample Tests

2008–2009

Bronx High School of Science

The Brooklyn Latin School

Brooklyn Technical High School

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

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

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



## MESSAGE TO STUDENTS AND PARENTS

### About Specialized High Schools Admissions

The 2008-2009 *Specialized High Schools Student Handbook* describes the programs and admissions procedures for the Specialized High Schools in New York City, which are: Fiorello H. LaGuardia High School of Music & Art and Performing Arts, Bronx High School of Science, The Brooklyn Latin School, Brooklyn Technical High School, High School for Mathematics, Science and Engineering at the City College, High School of American Studies at Lehman College, Queens High School for the Sciences at York College, Staten Island Technical High School, and Stuyvesant High School. These schools were established under New York State Law 2590 – Section G. **To apply, students must be residents of New York City.** Each school provides students with a unique opportunity to pursue special interests and to develop their talents. Entrance into these schools is by examination except for Fiorello H. LaGuardia High School of Music & Art and Performing Arts which is by audition and a review of academic records. You should meet with your guidance counselor to discuss registration for the Specialized High Schools Admissions Test (SHSAT) or audition requirements.

In this handbook, you will find useful information about the Specialized High Schools including programs in the schools, admission procedures, sample tests with test-taking tips, and a calendar of important dates. This handbook can be used by students and parents. Included in this handbook are two complete sample tests of the Specialized High Schools Admissions Test with answers and explanations to help you prepare for the actual test. It is important to familiarize yourself with the information contained in this handbook.

The *Specialized High Schools Student Handbook* is a project of the New York City Department of Education, the Office of Student Enrollment and the Office of Accountability.

For more information on other New York City public high schools, please see the *Directory of the New York City Public High Schools* or online at <http://schools.nyc.gov/ChoicesEnrollment/High/default.htm>.

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## The **SPECIALIZED** High Schools

*There are nine Specialized High Schools in New York City. For eight of these schools, admission is based on the score attained on the Specialized High Schools Admissions Test (SHSAT). The exception is Fiorello H. LaGuardia High School of Music & Art and Performing Arts (LaGuardia High School) where acceptance is by audition and a review of academic records. General descriptions for the Specialized High Schools can be found in the Directory of the New York City Public High Schools (online at <http://schools.nyc.gov/ChoicesEnrollment/High/default.htm>). Below is more information about the Specialized High School programs.*

### Bronx High School of Science

**75 West 205th Street, Bronx, New York 10468**

**TELEPHONE:** (718) 817-7700

**WEBSITE:** [www.bxscience.edu](http://www.bxscience.edu)

**E-MAIL:** [reidy@bxscience.edu](mailto:reidy@bxscience.edu)

Bronx High School of Science has a world-renowned reputation, boasting seven Nobel Laureates, more than most countries, and is the nation's all-time leader in the Westinghouse/Intel Science Talent Search. Bronx Science provides an enriched and diverse program to prepare students for leadership positions in science and society. Teachers are recognized professionals specializing in the sciences, arts, and humanities. Students benefit from a well-rounded education.

Bronx High School of Science offers Advanced Placement courses in physics, chemistry, biology, calculus, statistics, computer science, United States history, government, economics, world history, European history, English literature, English language, French Latin language, Spanish literature, Spanish language, Japanese, Russian, art history, studio art, and music theory. Bronx Science also offers nine languages, extensive electives in biology, physics, chemistry, technology, and the humanities. The music department offers the opportunity to participate in the orchestra, band, chorus, and jazz ensembles.

Extracurricular activities include over 60 after-school clubs, 30 athletic teams, an internationally acclaimed Speech and Debate Team, Mock Trial, a world-class Robotics Team, two full-scale theatrical productions, school newspaper, and journals.

### The Brooklyn Latin School

**325 Bushwick Avenue, Brooklyn, New York 11206**

**TELEPHONE:** (718) 366-0154

The Brooklyn Latin School provides a rigorous education in the classics through a student-centered approach that stresses questioning, discussion, and exploration of the ideas that have shaped Western society.

Students are required to take four years of Latin, along with four years of English and history, and three years of laboratory science. All classes conduct Socratic Seminar and round-table discussions led by students, including regular public speaking exercises, known as declamations.

In the first year, students are introduced to the classical world. In their English survey class, students read cornerstone works such as *The Odyssey* and *The Aeneid*. At the same time, they study the history of classical civilizations such as Egypt and Greece and translate selections from Roman literature in their introductory Latin class. All freshmen are also required to take physics, mathematics, art history, and a modern foreign language (Spanish).

Upperclassmen take advanced-level classes, which stress an in-depth approach to subject matter and instruction. Electives are offered in the humanities, along with sciences such as chemistry and biology.

In addition to academics, The Brooklyn Latin School provides a full range of physical education offerings, along with counseling services and extracurricular activities. Students are encouraged to take an active role in molding the culture of the school, and it is expected that their time at Brooklyn Latin will prepare them to become the future leaders of the nation.

### Brooklyn Technical High School

**29 Fort Greene Place, Brooklyn, New York 11217**

**TELEPHONE:** (718) 804-6400

**WEBSITE:** [www.bths.edu](http://www.bths.edu)

Brooklyn Technical High School is committed to providing an outstanding educational experience in the areas of engineering, the sciences, and computer science for its student body.

During the ninth and tenth grades, all students take an academic core and begin to explore the fields of engineering, science, and computers through hands-on experience in fully equipped laboratories, computer centers, shops, and theory classes.

For the eleventh and twelfth grades, Tech students choose one of the following major areas of concentration, organized in schools: Aerospace Engineering, Architecture, Bio-Medical, Chemistry, Civil Engineering, Computer Science Technology, Electro-Mechanical Engineering (Applied Physics), Environmental Science, Industrial Design, International Arts and Sciences, Law & Society, Mathematics, Media Communications, and Social Science Research.

While specializing in these areas, students continue their academic core. It is important to note that ALL Tech students meet the requirements to enter ANY field of study on the college level, regardless of their major. However, they are particularly well prepared in their major area of concentration.

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## High School for Mathematics, Science and Engineering at the City College

**138th Street and Convent Avenue, New York, New York 10031**

**TELEPHONE: (212) 220-8179**

**WEBSITE: [www.hsmse.org](http://www.hsmse.org)**

The High School for Mathematics, Science and Engineering at the City College provides an educational experience in which students are challenged to expand their intellect and to develop habits of inquiry, expression, critical thinking, and problem seeking, as well as problem solving, research, and presentation. The high school's rigorous instructional program focuses on mathematics, engineering, and science.

The curriculum encompasses core courses and advanced studies including writing and composition, history, literature, language, mathematics, science, engineering, and the arts. The courses are integrated with collegiate experiences throughout the core and elective courses, including a variety of summer institutes related to individualized student interests. Additional enrichment opportunities include school publications and academic competitions, such as a Math Team, Science Olympiad, and Robotics.

Students will have the opportunity to complete high school requirements in the third year of study and during their fourth year of high school to enroll in college courses related to their field of interest.

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## High School of American Studies at Lehman College

**2925 Goulden Avenue, Bronx, New York 10468**

**TELEPHONE: (718) 329-2144**

**WEBSITE: [www.lehman.cuny.edu/hsas](http://www.lehman.cuny.edu/hsas)**

The High School of American Studies at Lehman College emphasizes the study of American history and offers students an academic program that is both well-rounded and challenging. Our goal is to prepare students for admission to highly competitive colleges and for a wide range of careers in politics, law, journalism, business, science, mathematics, and the arts.

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 firsthand 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, 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. After school, students may participate in a wide variety of extracurricular activities and PSAL sports. In all of our endeavors, we seek to encourage in our students a love for learning and an inquisitive spirit.

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## Queens High School for the Sciences at York College

**94-50 159th Street, Jamaica, New York 11451**

**TELEPHONE: (718) 657-3181**

**WEBSITE: [www.qhssyc.org](http://www.qhssyc.org)**

**E-MAIL: [qhssatyc@yahoo.com](mailto:qhssatyc@yahoo.com)**

The Queens High School for the Sciences at York College emphasizes science, mathematics, and technology education. Students who seek a rigorous academic education receive a comprehensive high school education with the addition of an extra class each day in Science Research, Mathematics Research/Mathematics Team, or Technology Education. All students receive instruction in carrying on research and have the opportunity to develop an Intel research project by the senior year. Students are assigned to research project advisors who mentor them throughout their four years of high school.

The education program provides cross-curricular learning experiences. Research opportunities, with technology education infused across all curricula, prepare students for understanding and competing in a highly technological society. An emphasis on communication skills, including speaking and writing, develops the students' critical thinking processes needed to meet the challenges of their academic and personal endeavors. Flexible scheduling, such as modular or block scheduling, allows for extended time and the ability to include extra classes within the school-day timeframe. The school's rigorous curriculum exceeds State and City standards and prepares students for career, college, and success in all of life's endeavors.

Students have opportunities to complete many of their high school Regents requirements within three years and pursue college academic subjects on the York College campus during their senior year. Students with an interest in pursuing medicine as a career will be eligible to participate in York College's Bridge to Medicine Program.

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## Staten Island Technical High School

485 Clawson Street, Staten Island, New York 10306

TELEPHONE: (718) 667-5725

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

E-MAIL: [gpo@SITHS.org](mailto:gpo@SITHS.org)

Staten Island Technical High School provides a demanding and challenging college preparatory curriculum emphasizing mathematics, science, computers, engineering, and the humanities.

Facilities include state-of-the-art science, engineering, and computer laboratories. Along with a highly engaging, rigorous core curriculum, all students are scheduled for technical courses in Computer Software, Engineering Survey, Technical Drawing with Inventor Technology, Electronics, AutoCAD with Mannequin Technology, Programming in C++, CISCO Networking, Forensic Science, and Biotechnology and Molecular Science. Students may participate in the school's Science Engineering Research Program (SERP) and selected internships.

The students at Staten Island Tech have the opportunity to take Advanced Placement courses in physics, chemistry, biology, calculus, macroeconomics, English, social studies, and Russian. In addition, elective courses are offered in Web Design and Advanced AutoCAD. Students interested in the performing arts may participate in band, ensembles, dance, and drama.

As part of the school's co-curricular and extended-day programs, students have the opportunity to participate in a variety of activities, such as student government, publications, performing arts programs, PSAL teams that foster the development of a well-rounded scholar athlete, and various college-credit courses offered on site.

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## Stuyvesant High School

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

TELEPHONE: (212) 312-4800

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

Stuyvesant High School, founded in 1904, has been and continues to be committed to excellence in education. The school's enriched curriculum includes required courses for graduation and affords its students the opportunity to take advanced courses.

Some of these advanced courses are in mathematics and science, including calculus, qualitative analysis, organic chemistry, and astronomy. In addition, a wide range of electives in other disciplines is available. The Technology Department course offerings include technology computer drafting, computer science, and robotics. Students interested in music may participate in symphonic band, symphony orchestra, jazz band, and various choral groups and ensembles.

Students have the opportunity to participate in independent research and to take college courses at New York University, Hunter College, and City College of New York. Stuyvesant High School prides itself on the number of National Merit, National Achievement, National Hispanic Scholars, and Intel Science Talent Research recipients and finalists it has garnered every year. Stuyvesant High School is also proud of its extensive extracurricular program. There are 31 athletic teams, 20 major publications, and an active and elaborate system of student government, making it one of the most unique high schools in America.

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

100 Amsterdam Avenue, New York, New York 10023

TELEPHONE: (212) 496-0700

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

E-MAIL: [laguardiaadmissions@yahoo.com](mailto:laguardiaadmissions@yahoo.com)

The Fiorello H. LaGuardia High School of Music & Art and Performing Arts enjoys an international reputation as the first and foremost high school dedicated to nurturing students gifted in the arts. LaGuardia Arts continues to be the model for schools for the arts throughout the world because the school provides a uniquely balanced educational experience that includes both rigorous conservatory-style training and a challenging, comprehensive college-preparatory academic program. The conservatory programs include Dance, Drama, Instrumental and Vocal Music, Fine Arts, and Technical Theatre.

Students in the **Dance** program will study ballet and modern dance; supplementary courses include: dance history, choreography, theatre dance (tap and jazz), career management, and survival skills. In **Drama**, the focus is on theatre preparation through courses in acting, voice and diction, physical techniques, theatre history, and script analysis. **Instrumental Music** and **Vocal Music** courses include: sight singing, diction, music theory, and music history. The Vocal Music Studio also includes performing opportunities in musical theatre, opera, choir, chamber music, and solo voice, and training in Italian, German, and French vocal literature. The Instrumental Music Studio courses include four symphonic orchestras, three concert bands, and two jazz bands, as well as electives in chamber music, conducting, and electronic music. In the area of **Fine Arts**, drawing, water color, 3-D design, oil/acrylic painting, ceramics, photography, sculpture, illustration, advanced painting, and drawing are offered. In **Technical Theatre**, the focus is on practical theatre training in scenic carpentry, costume construction, drafting, electronics, sound properties, stage management, and design. Each year's program culminates in performances and exhibitions. The 2,600 students at LaGuardia High School can expect to put in a longer school day and, at performance times, will be required to spend many extra hours in rehearsal. **Auditions** will be held at the school. See pages 8-9 for audition information.

## for the Specialized High Schools Admissions Process

**September 17, 2008 - October 8, 2008 – Meet with your School Guidance Counselor**  
**October 8, 2008 – Last day to register for the Specialized High Schools Admissions Test**  
**October 17, 2008 – Admission Ticket available for distribution**  
**December 2, 2008 – Deadline for submission of the High School Admissions Application**

### Specialized High Schools Admissions Test (SHSAT) Dates and Locations

All current 8th and 9th grade students in public, private, and parochial schools applying for one or more of the Specialized High Schools in New York City must take the Specialized High Schools Admissions Test (SHSAT). Testing sites are specified below, and students are assigned to a testing site based on the geographic district in which the student's school is located. Students applying only to Fiorello H. LaGuardia High School of Music & Art and Performing Arts do not have to take the SHSAT; entrance is based on audition requirements and a review of their academic record.

TEST DATES (For location, see chart below.)	
All current 8th grade students	Saturday, October 25, 2008 Sunday, October 26, 2008
All current 9th grade students 8th and 9th grade students with special needs and approved 504 Accommodations	Saturday, November 8, 2008
9th grade Sabbath observers Sabbath observers with special needs and approved 504 Accommodations Make-up test with permission only	Sunday, November 23, 2008 Test location is Stuyvesant High School only.
Students new to NYC (Records must show that you arrived in NYC after the November make-up test.)	End of summer 2009

TESTING LOCATIONS		
8 <sup>th</sup> and 9 <sup>th</sup> Grade Students attending schools in:	Testing Sites	Address
Manhattan	Stuyvesant High School	<b>345 Chambers Street, New York, NY 10282-1099</b> <b>Tel:</b> (212) 312-4800 <b>Subways:</b> 1, 2, 3, 9, A, C, E, to Chambers Street <b>Buses:</b> M1, M6 to Broadway & Chambers
Bronx	Bronx High School of Science	<b>75 West 205<sup>th</sup> Street, Bronx, NY 10468</b> <b>Tel:</b> (718) 817-7700 <b>Subways:</b> 4, B or D to Bedford Park Boulevard <b>Buses:</b> BX1, BX2, BX22, BX26C, BX28, BX32, BX39, BQE Liberty Lines Express from Manhattan and Gagnon Bus Service from Queens
Brooklyn Districts 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 32	Brooklyn Technical High School	<b>29 Fort Greene Place, Brooklyn, NY 11217</b> <b>Tel:</b> (718) 804-6400 <b>Subways:</b> 2, 3, 4, 5 (rush hours only) to Atlantic Ave.: G to Fulton Street; A to Jay Street; M, N, R to DeKalb Avenue or Pacific Street; or Q to DeKalb Avenue <b>Buses:</b> B15, B22, B25, B37, B38, B41, B54, B63 or B67
Queens Districts 24, 25, 26, 28	Long Island City High School	<b>Broadway at 21<sup>st</sup> Street, Long Island City, NY 11106-3402</b> <b>Tel:</b> (718) 545-7095 <b>Subways:</b> N to Broadway <b>Buses:</b> Q19A, Q102, or Q104 to Broadway and 21 <sup>st</sup> Street
Queens Districts 19, 27, 29 (8th grade test administered only on Oct. 25 at John Adams High School.)	John Adams High School	<b>101-01 Rockaway Boulevard, Ozone Park, NY 11417</b> <b>Tel:</b> (718) 322-0500 <b>Subway:</b> A to 104 <sup>th</sup> Street <b>Buses:</b> Q7, Q8, Q11, Q21, Q21A, Q41 to Rockaway Boulevard & 102 <sup>nd</sup> Street; Q112 to Liberty Avenue & 105 <sup>th</sup> Street
Staten Island	Staten Island Technical High School	<b>485 Clawson Street, Staten Island, NY 10306</b> <b>Tel:</b> (718) 667-5725 <b>Subways:</b> Staten Island Rapid Transit to New Dorp <b>Buses:</b> S78, S79 to Hylan Boulevard & Allison Avenue; S57 to Rose Avenue & New Dorp Plaza or Hylan Boulevard & Ebbits Street; S76 to New Dorp Lane and Clawson Street; S74 to Richmond Road & New Dorp Lane

## Audition Information

Only students who are residents of New York City are eligible for these auditions. Students may audition for the following studios:

**ART ■ DANCE ■ DRAMA ■ INSTRUMENTAL MUSIC ■ TECHNICAL THEATRE ■ VOCAL MUSIC**

*Students should bring a copy of their June 2008 report card for each audition. Students may wish to bring a light snack. Individual auditions may be delayed and students may be kept for a full day. It is the responsibility of candidates to be aware of all audition procedures as described in this handbook and in the *Directory of the New York City Public High Schools*.*

**Art** students will need a portfolio of 10-20 pieces of *original* artwork done in a variety of media. The artwork should be from observation, imagination, and memory, and labeled appropriately. Photographs—not originals—of three-dimensional works may be included. For their audition, students will be given drawing assignments, including drawing the human figure from observation, drawing a still life from memory, and creating a drawing in color, based on imagination. All materials for the audition will be supplied at the time of the test.

The **Dance** audition consists largely of the participation of the applicants in two classes in which an evaluation is made of their potential to succeed in the specific training offered in this curriculum. Candidates also may be asked to perform a brief dance prepared in advance (modern dance or ballet, if possible) for which CDs, records, tapes, or cassettes may be used. All candidates are expected to bring dance clothes for the audition, including footless tights.

**Drama** students should memorize and be prepared to perform two one-minute monologues. Characters from modern plays that are appropriate to the student's age and gender should be selected. The applicant will be asked to do an impromptu reading with a student-actor. Attire should allow free movement, since applicants may be asked to demonstrate how well they move physically.

**Instrumental Music** students should come to their audition with their instruments. Piano, percussion, tuba, double bass, and harp, as well as guitar amplifiers, will be provided. Students are expected to perform prepared selections without accompaniment. Applicants will be tested for rhythm and tonal memory and will be asked to sight-read.

**Vocal Music** students should prepare a song to sing without accompaniment for their audition. The musical selection can be classical or popular in style. Students will be tested for rhythm and tonal memory.

**Technical Theatre** Audition: Students should read one play: *The Miracle Worker*, *A Raisin in the Sun*, or *Julius Caesar*. Bring in a prepared visual aid representing your interpretation of a moment in a scene for one of the following areas: costume, scenery, or lighting.

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

## 2008–2009 AUDITION DATES

All Auditions are held at LaGuardia High School. Dates are scheduled according to the borough in which your school is located, not where you live, and by the first letter of the student's last name.		
AUDITION GROUP	DATE	START TIME
<b>Brooklyn A – L</b> (Students auditioning for a single studio only)	Saturday, November 1, 2008	7:30 AM
<b>Brooklyn M – Z</b> (Students auditioning for a single studio only)	Saturday, November 1, 2008	11:30 AM
<b>Brooklyn A – Z</b> (Students auditioning for two or more studios)	Sunday, November 2, 2008	7:30 AM
<b>Manhattan A – F</b> (Students auditioning for a single studio only) and <b>Queens/Staten Island A – L</b> (Students auditioning for a single studio in Dance or Drama or Technical Theatre only)	Saturday, November 15, 2008	7:30 AM
<b>Manhattan G – L</b> (Students auditioning for a single studio only)	Saturday, November 15, 2008	11:30 AM
<b>Manhattan A – Z</b> (Students auditioning for two or more studios)	Sunday, November 16, 2008	7:30 AM
<b>Bronx A – L</b> (Students auditioning for a single studio only)	Saturday, November 22, 2008	7:30 AM
<b>Bronx M – Z</b> (Students auditioning for a single studio only)	Saturday, November 22, 2008	11:30 AM
<b>Bronx A – Z</b> (Students auditioning for two or more studios)	Saturday, November 22, 2008	7:30 AM
<b>Manhattan M – R</b> (Students auditioning for a single studio only) and <b>Queens/Staten Island M – Z</b> (Students auditioning for a single studio in Dance or Drama or Technical Theatre only)	Sunday, November 23, 2008	7:30 AM
<b>Manhattan S – Z</b> (Students auditioning for a single studio only)	Sunday, November 23, 2008	11:30 AM
<b>Queens/Staten Island A – Z</b> (Students auditioning for two or more studios)	Saturday, December 6, 2008	7:30 AM
<b>Queens/Staten Island A – L</b> (Students auditioning for a single studio only) No Auditions for Dance or Drama or Technical Theatre on this day (See November 15)	Sunday, December 7, 2008	7:30 AM
<b>Queens/Staten Island M – Z</b> (Students auditioning for a single studio only) No Auditions for Dance or Drama or Technical Theatre on this day (See November 23)	Sunday, December 7, 2008	11:30 AM

You must arrive on time and be prepared as outlined in the audition guidelines on page 8.  
All audition ending times vary according to studio.

### Audition Exceptions

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

Students taking the SHSAT who have a conflict with the audition schedule are to report for their audition(s) on the weekend assigned to their borough on the Saturday or Sunday for which there is not a conflict with the SHSAT.

### Auditions for Students New to NYC

End of summer 2009 (records must show that you arrived in NYC after the last audition date).

## Specialized High Schools Application Process

### APPLYING TO THE SPECIALIZED HIGH SCHOOLS

#### 1 Step One: Contact Your Guidance

**Counselor.** You should contact your school guidance counselor to indicate your plan of taking the SHSAT and/or auditioning for LaGuardia High School.

#### 2 Step Two: Obtain a Test or Audition Ticket.

Prior to the testing/audition date, your school guidance counselor will provide you with a **SHSAT Admission Ticket and/or a ticket for admission to the LaGuardia auditions**. This ticket will indicate the location of the test/audition site, the date and time of the SHSAT/audition, your student ID number (for NYC public school students only), and the school code number of your current school. If you have a conflict with the test date to which you have been assigned, inform your counselor immediately to arrange an alternate test date. Your test site is based on the location of your current school, not where you live.

#### 3 Step Three: Rank Your Choices.

On the back of the Admission Ticket you will need to rank, in priority order, your choices for the Specialized High Schools to which you want to apply. You will need to submit your ranking of the Specialized High Schools on the day of the test, and the ticket must be signed by your parent. You and your parents will need to determine the Specialized High Schools for which you wish to be considered and the ranking order in which you will list them on your application. Consider the focus of the academic program, the size of the school, travel arrangements, as well as travel time. You may choose to apply for only one school, or you can choose to apply to as many as eight schools. To increase your chances of being offered a seat in one of the Specialized High Schools, you are encouraged to choose as many schools as interest you; however, you should only list schools that you wish to attend should you be offered a seat.

#### 4 Step Four: Complete and Submit Your High School Admissions Application.

In order for you to receive the result of your SHSAT or the result of your audition at LaGuardia High School and to be considered for admission to a Specialized High School, you must complete and submit to your guidance counselor a New York City Public High School Admissions Application

prior to the deadline (December 2, 2008). Additional information about the High School Admissions Process is online at <http://schools.nyc.gov/ChoicesEnrollment/High/default.htm>.

#### SHSAT Testing Procedures

- ▶ Remember to bring your **Admission Ticket with you** to your assigned test site on the day of the test. It is important to arrive at the test site at the time indicated on your **SHSAT Admission Ticket**. Please be advised that your picture will be taken at the test site prior to the start of the test.
- ▶ On the back of the SHSAT Admission Ticket you must rank, in priority order, the Specialized High Schools to which you want to apply. This sheet must be signed by your parent. You will also be required to indicate this ranking on the answer sheet.
- ▶ Before you begin the test, you will be asked to read and sign a statement indicating that you are well enough to take the test and are taking it at the appropriate grade level. **If you do not feel well, advise the test proctor immediately; do not begin the test, and do not sign the statement.**

**STUDENTS PLEASE NOTE:** If you believe there is interference during any part of this test, you must bring the matter to the attention of the proctor immediately. This may include a misprinted test booklet, undue noise, or improper student behavior. The proctor will attempt to remedy the situation and take a written statement from you at the end of the test.

If you suspect any proctoring irregularities during the test administration, you must submit a letter about the situation to the Office of Student Enrollment, 52 Chambers Street, Room 415, New York, NY, 10007. This letter must be sent by certified mail with proof of delivery and postmarked no later than one week after the test administration.

#### Auditioning for LaGuardia High School

- ▶ If you are interested in applying to one or more of the six programs at LaGuardia High School, review the audition requirements listed on page 8 of this handbook and also in the *Directory of the New York City Public High Schools* and prepare for your auditions.

▶ To audition for one or more of the programs at LaGuardia High School, inform your guidance counselor of your intention to audition and for which studio(s) you wish to audition. Your guidance counselor will provide you with an audition ticket prior to the audition date.

▶ You must also complete the New York City Public High School Admissions Application. On your High School Admissions Application you will be required to indicate the LaGuardia High School studio(s) for which you wish to be considered based on your audition.

### Notification Information

▶ In February 2009, you will be notified as to whether or not you received an offer(s) to the Specialized High Schools. If you qualify for an offer in one of the Specialized High Schools based on your test score and/or audition, then your score and your ranking of schools will be used to determine your offer.

▶ If you audition for one or more of the programs at LaGuardia and take the SHSAT, it is possible for you to receive an offer to one of the Specialized High Schools and one or more of the programs in LaGuardia.

▶ If you receive an offer to a Specialized High School you may, at the same time, receive your match to one of the other high school choices that you submitted on your New York City High School Admissions Application. At this time you may accept either your Specialized High School offer or your other high school offer.

## ADMISSIONS PROCESS

### Specialized High Schools Admissions Test

**The process is designed to match students based on their SHSAT scores and how they ranked the Specialized High Schools.**

▶ Acceptance to a Specialized High School is based first on the student's test score, then on the priority order in which the student placed the Specialized High Schools and on seat availability.

▶ All scores of the students taking the test are ranked from highest score to lowest score.

▶ The student with the highest score is placed in his/her first choice (highest prioritized school).

▶ Going down the list from the highest score, each student, in turn, is placed in his/her highest prioritized school in which seats are still available. Therefore, if all the seats in the student's first-choice school have been offered to students who scored higher, he/she is placed in his/her second-choice school if seats are available. If all the seats in his/her second-choice school have been given to students who scored higher, the student is offered a seat in his/her third-choice school if there are still seats available, and so on. This process continues until there are no seats available in any of the eight Specialized High Schools.

*\*This process was implemented beginning with the entering class of September 2003.*

## Additional SHSAT INFORMATION

### Make-Up Tests

▶ If your test date conflicts with a religious observance, please immediately notify your counselor and an alternate test date will be arranged.

▶ If you are ill and unable to take the test on your scheduled date, when you return to school immediately notify your counselor, present medical documentation, and request to take the SHSAT on the Make-Up Test Day.

▶ Before you begin the test, you will be asked to read and sign a statement indicating that you are well enough to take the test and are taking it at the appropriate grade level. **If you do not feel well, advise the test proctor immediately; do not begin the test, and do not sign the statement.** Once you have begun the test, you may not—either then or at a later date—request a make-up test because of illness.

### Special Needs

Students classified by the Committee on Special Education as having a disability or students with approved 504 Plans may be eligible for test accommodation(s) if prescribed in their Individualized Education Programs (IEPs) or approved 504 Plans. The student's current school is responsible for submitting the IEP and/or approved 504 Plan documentation in the fall during the SHSAT registration process. Please note, however, that because these tests measure students' proficiencies involving calculations, the use of a calculator or mathematics tables is not allowed for the Mathematics section. Similarly, because the Verbal section of the test measures reading comprehension, passages may not be read aloud in the Verbal section.

## The Specialized High Schools Admissions Test has two sections, Verbal and Mathematics.

### VERBAL SECTION (45 questions)

Verbal reasoning is measured by 5 questions on ordering sentences to form a paragraph and 10 questions on logical reasoning. Reading comprehension is measured by 5 reading selections, each of which is followed by 6 questions tapping your ability to understand, analyze, and interpret what you have read. You should not spend more than 75 minutes on this section. You may go back to this section after completing the mathematics section.

### MATHEMATICS SECTION (50 questions)

This section consists of word problems and computation questions. It is recommended that you allow yourself 75 minutes on this section. If you finish early, you may go back to questions in either section.

## Test Materials

### For each student, the testing site will provide:

- a test booklet
- a separate answer sheet
- scrap paper for use in solving logical reasoning and mathematics problems, which will be collected at the end of the test

### You must bring to the testing session:

- an admission ticket signed by your parent with your Specialized High School choices
- sharpened Number 2 pencils (a ballpoint pen or other ink cannot be used for machine scoring)
- an eraser
- a non-calculator watch to keep track of your working time

**Do not bring a calculator or any other computation aids. Do not bring cell phones, beepers, or pagers to the test site. Such devices will not be permitted.**

## Filling In the Answer Sheet

Before taking the test, you will need to provide information such as your name, student ID number (NYC public school students only), school number, and school choices on your answer sheet.

It is important to fill in the bubbles completely, so that your score will not be delayed.

In **Grid 5** bubble in your name as it appears in your school records and on your high school application. Do not use your nickname or “American” name. For example, if your name on school records is Michelle, bubble in that name, even if most people call you “Shelly.” Or if your name on school records is Mei-Ling, bubble in that name, even if most people call you “Melanie.” See example below.

5. FIRST NAME (please print)										
M	E	I	-	L	I	N	G			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. FIRST NAME (please print)										
M	E	L	A	N	I	E				
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Grid 6** is for your choice of Specialized High Schools. If Grid 6 is not marked correctly, your admission to a Specialized High School will be affected because your admission is based on the score you attain and the order in which you rank your school preferences. Therefore, it is very important that you make your decisions about ranking schools before the day of the test. Discuss the schools in which you are interested with your parents and then together determine the order in which you will list them on the answer sheet. Enter these rankings on your Admission Ticket so that you will be able to carefully copy them onto the grids on your answer sheet at the test site.

**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 at least a first-choice school. Fill in only one school for each choice. Fill in only one circle in a row and only one circle in a column. Do not fill in a school more than once. Do not fill in the same school for each choice.

### EXAMPLES OF CORRECT GRID 6

6. CHOICE OF HIGH SCHOOL

- Indicate your school choice and order of preference.
- Fill in one school for each choice.
- Fill in only one circle in a row.
- Fill in only one circle in a column.
- Do not fill in the same school for each choice.

SCHOOL	CHOICE							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Am. Studies/Lehman	<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"/>
Bronx Science	<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 Latin	<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"/>
Brooklyn Tech	<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"/>
MSE/CCNY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queens Sci./York	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staten Island Tech	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stuyvesant	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. CHOICE OF HIGH SCHOOL

- Indicate your school choice and order of preference.
- Fill in one school for each choice.
- Fill in only one circle in a row.
- Fill in only one circle in a column.
- Do not fill in the same school for each choice.

SCHOOL	CHOICE							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Am. 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"/>
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"/>
MSE/CCNY	<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"/>					
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"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**You MUST fill in at least a first-choice school.**

### EXAMPLES OF INCORRECT GRID 6

6. CHOICE OF HIGH SCHOOL

- Indicate your school choice and order of preference.
- Fill in one school for each choice.
- Fill in only one circle in a row.
- Fill in only one circle in a column.
- Do not fill in the same school for each choice.

SCHOOL	CHOICE							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Am. 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"/>
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"/>
MSE/CCNY	<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"/>
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.**

6. CHOICE OF HIGH SCHOOL

- Indicate your school choice and order of preference.
- Fill in one school for each choice.
- Fill in only one circle in a row.
- Fill in only one circle in a column.
- Do not fill in the same school for each choice.

SCHOOL	CHOICE							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Am. Studies/Lehman	<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"/>
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 checked="" type="radio"/>	<input type="radio"/>	<input checked="" 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"/>
MSE/CCNY	<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.**

6. CHOICE OF HIGH SCHOOL

- Indicate your school choice and order of preference.
- Fill in one school for each choice.
- Fill in only one circle in a row.
- Fill in only one circle in a column.
- Do not fill in the same school for each choice.

SCHOOL	CHOICE							
	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice	8th choice
Am. Studies/Lehman	<input type="radio"/>							
Bronx Science	<input type="radio"/>							
Brooklyn Latin	<input type="radio"/>							
Brooklyn Tech	<input type="radio"/>							
MSE/CCNY	<input type="radio"/>							
Queens Sci./York	<input type="radio"/>							
Staten Island Tech	<input type="radio"/>							
Stuyvesant	<input checked="" type="radio"/>							

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

**GRID 9**

<b>9. SCHOOL WHERE YOU ARE NOW ENROLLED</b>																																																									
Abraham Lincoln JHS 171, Brooklyn																																																									
<b>NAME OF SCHOOL</b>	<b>School Code</b>	<b>Letter (private or parochial schools only)</b>																																																							
<b>BOROUGH</b> <input checked="" type="radio"/> Brooklyn <input type="radio"/> Manhattan <input type="radio"/> Queens <input type="radio"/> Bronx <input type="radio"/> Staten Island <input type="radio"/> Other	<table border="1"> <tr> <td>1</td> <td>9</td> <td>1</td> <td>7</td> <td>1</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td>1</td><td>1</td><td>1</td><td>1</td><td>1</td> </tr> <tr> <td>2</td><td>2</td><td>2</td><td>2</td><td>2</td> </tr> <tr> <td>3</td><td>3</td><td>3</td><td>3</td><td>3</td> </tr> <tr> <td>4</td><td>4</td><td>4</td><td>4</td><td>4</td> </tr> <tr> <td>5</td><td>5</td><td>5</td><td>5</td><td>5</td> </tr> <tr> <td>6</td><td>6</td><td>6</td><td>6</td><td>6</td> </tr> <tr> <td>7</td><td>7</td><td>7</td><td>7</td><td>7</td> </tr> <tr> <td>8</td><td>8</td><td>8</td><td>8</td><td>8</td> </tr> <tr> <td>9</td><td>9</td><td>9</td><td>9</td><td>9</td> </tr> </table>	1	9	1	7	1	0	0	0	0	0	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	<input type="radio"/> P
1	9	1	7	1																																																					
0	0	0	0	0																																																					
1	1	1	1	1																																																					
2	2	2	2	2																																																					
3	3	3	3	3																																																					
4	4	4	4	4																																																					
5	5	5	5	5																																																					
6	6	6	6	6																																																					
7	7	7	7	7																																																					
8	8	8	8	8																																																					
9	9	9	9	9																																																					
<b>TYPE OF SCHOOL</b> <input checked="" type="radio"/> NYC Public <input type="radio"/> Private or Parochial																																																									

Answers must be recorded on the answer sheet to be counted. Answers left in the test booklet or on scrap paper will not be counted.

SAMPLE ANSWER MARKS						
1	(A)	(B)	(C)	(D)	(●)	RIGHT
2	(W)	(B)	(C)	(D)	(E)	WRONG
3	(F)	(X)	(H)	(J)	(K)	WRONG
4	(A)	(B)	(●)	(D)	(E)	WRONG
5	(F)	(G)	(●)	(●)	(K)	WRONG

In **Grid 9**, print the name and borough of the school where you are now enrolled. Then indicate if this is a public or private school. Bubble in your school code exactly as it appears on the school list that you will receive on the day of the test. A bubbling error may delay your score. For example, a student who attends Abraham Lincoln JHS 171 in Brooklyn should bubble in the school number as shown in the example above.

When you are told to begin the test, mark your answers on the answer sheet by completely filling in the appropriate bubble (see example above). 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.

You may write in your test booklet or on the scrap paper provided to solve verbal or mathematics problems, but your answers must be recorded on the answer sheet in order to be counted. Information in the test booklet or on scrap paper will not be counted.

**GRID 10**

<b>10. STUDENT ID NUMBER</b>										
<b>(For NYC Public Students Only)</b>										
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

**Grid 10** is labeled “STUDENT ID NUMBER.” This number is for New York City public school students only. You will find this number on your Admission Ticket for the test. In the boxes in Grid 10, write your nine-digit student ID number. Below each box, fill in the circle containing the same numeral as the box. (See the example above.) If you are a private or parochial school student, leave this grid blank.

# SHSAT Scoring, Reporting & REVIEW PROCEDURES

Your SHSAT score is based on the number of correct answers marked. There is no penalty for wrong answers. If you are not sure of an answer, mark your best guess. Do not spend too much time on any one question. Answer each question as best you can or skip it and keep going. If you have time at the end of the test, you may go back.

Each answer sheet is scanned and scored electronically, and the number of correct answers, called a 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 were 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. In a process called calibration, verbal and mathematics raw scores are converted into scaled scores. The raw scores and scaled scores are not proportional. 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 reason for this difference is that the scaled scores have been adjusted to fit the normal curve. Scaled scores are on a scale that is common to all test forms, making it possible to compare these scores directly. The composite score is the sum of the verbal and mathematics scaled scores. The composite score is used to determine admission to a Specialized High School.

## Discovery PROGRAM

As stated in the State law, the Specialized High Schools are permitted to sponsor a Discovery Program to give disadvantaged students of demonstrated high potential an opportunity to participate in the Specialized High School program.

To be eligible, the student must:

1. have scored close to the admission cut-off score on the SHSAT; and
2. be certified as disadvantaged by his/her middle school according to any one of the following criteria:
  - a. attend a Title 1 school and be from a family whose total income is documented as meeting federal income eligibility guidelines established for school food services by the NYS Department of Agriculture, effective July 1, 2008; or
  - b. be receiving assistance from the Human Resources Administration; or

## Student Notification

Schools will receive information indicating student test results for those students who filed a New York City High School Admissions Application. You must have a High School Admissions Application on file to obtain your SHSAT score.

**Students who did not file a High School Admissions Application will not be notified.** Students offered seats must indicate acceptance of the school to which they were selected by returning the signed letter to their guidance counselor.

Once students accept an offer to a school, they must remain in that school for a minimum of one year. The Specialized High Schools are prepared to provide whatever assistance students need to succeed. Parents of students who want to transfer must make a transfer request in writing and participate in a guidance conference before a transfer can be approved. **Students whose transfer is approved will be transferred to another high school, but not to another Specialized High School. (If a student feels that the Specialized High School is not a right "fit", that student is encouraged to apply for a tenth-grade seat through the high school admissions process.)**

## Review Procedures

After the schools, students, and parents are informed of the results, parents accompanied by their child may review the student's answer sheet by requesting an appointment with the Office of Student Enrollment. Appointments may be arranged by writing to the Office of Student Enrollment, 52 Chambers Street, Room 415, New York, New York, 10007. **The request must be sent by certified mail with proof of delivery and postmarked no later than April 1, 2009.** An appointment date will be arranged within approximately four weeks of receipt of the letter.

- c. be a member of a family whose income is documented as being equivalent to or below Department of Social Services standards; or
  - d. be a foster child or ward of the state; or
  - e. initially have entered the United States within the last four years and live in a home in which the language customarily spoken is not English; and
3. be recommended by his/her local school as having high potential for the Specialized High School program.
- Documentation supporting student eligibility must be attached to the recommendation form submitted by the middle school for the student.** Not all students recommended can be accepted into the Discovery Program. Those students who are successful in meeting the demands of the summer program will be retained by the school to which they were conditionally accepted. Those students who are not successful will attend the school to which they had previously been assigned. If you have questions, speak to your counselor.

*The Specialized High Schools Admissions Test (SHSAT) assesses knowledge and skills. These skills consist of the ability to comprehend English prose, to think through a verbal problem in order to reach a reasoned conclusion based on given information, and the ability to use problem-solving skills in mathematics. The test measures knowledge and skills you have gained over the years. Keeping up with your schoolwork throughout the year is the best possible preparation.*

## BEFORE TEST DAY

- **The best way to improve your verbal skills is to read many books and articles.** This helps you expand your vocabulary and improve your comprehension. While reading, ask yourself: What is the main point? What can be deduced? Why does the author use certain words? Is this article well written?
- **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 to use as practice. Each sample test contains questions from previous tests and has been updated to match the 2008 tests as closely as possible. A list of correct answers is provided for each test, along with explanations.
- **It is helpful to simulate the actual testing situation.** You will have two and a half hours to complete the test. During your practice test, how you allot the time between the verbal and mathematics sections is up to you. You may start on either section. It is recommended that you do not spend more than 75 minutes on either section. 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.
- **After you complete the practice 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 partially correct, but were not the best answers? Were many of your wrong answers guesses? You also should check to see whether there is a pattern to your errors. For example, did you get all the main idea questions wrong?
- **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.

## DAY OF THE TEST

- **The night before the test, remember to get a good night's sleep.** Arrive at your assigned test site on time. Wear comfortable clothes and bring a watch to keep track of the time. Make sure that you have several sharpened Number 2 pencils and an eraser that erases cleanly. Do not bring calculators, other computation aids, or cell phones.
- **Plan your time.** Be aware of the total number of questions and the amount of time you have to complete the test. Work carefully, but keep moving at a comfortable pace and keep track of the time.
- **Read the instructions carefully.** Be sure you understand the task before marking your answer sheet. For each question, read all the choices before choosing one. Many questions ask for the best answer; it is important to compare all the choices to determine the choice that best answers the question.
- **Mark your answers carefully.** This is a machine-scored test, and you can lose credit by marking the wrong answer bubble or marking the answers to two questions on the same line. Make sure the number on the answer sheet matches the number of the question in your test booklet. To change an answer, erase the original mark completely. If two bubbles are filled in for a question, that question will be scored as incorrect. You may write in your test booklet to solve verbal or mathematics problems. Avoid making stray pencil marks on your answer sheet.
- **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.
- **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.
- **There is no penalty for a wrong answer.** Your score is based on the number of correct answers marked on the answer sheet. Therefore, omitting a question will not give you an advantage, and wrong answers will not be deducted from your right answers. Fill in any blanks when the time limit is almost up.
- **Be considerate of other students during the test.** Do not chew gum or make noises or movements that would be distracting to others.

**SCRAMBLED PARAGRAPHS**

The scrambled paragraph portion of the test measures your ability to organize written material according to the sequence of ideas and/or cues provided by transitional words and phrases. There are five paragraphs, each consisting of six sentences. The first sentence is provided, with the remaining five presented in random order. You are to arrange the sentences in the author’s original order using cues contained in the sentences. Only one arrangement of each set of sentences will form a well-organized, cohesive, grammatically correct paragraph. **Each correctly ordered paragraph is worth double the value of a question in any other section of the test.**

The sentences contain words and phrases that help to identify the flow of ideas from one sentence to the next, perhaps describing a procedure or tracing a historical event. The sentences may also provide grammatical cues as to how to construct the paragraph. For example, the pronoun “she” may refer to someone mentioned in a previous sentence. Transitional words such as “although” and “however” also provide cues about how the sentences relate to one another.

As you put the sentences in order, it may help to write the correct position of each sentence in the blank to the left. For example, write “2” next to the sentence that you think follows the first sentence, “3” next to the sentence you think follows “2”, and so on.

**Read Example 1.** After reading all the sentences, you should have an idea of what the paragraph is about. Now go back to the given sentence and determine which sentence should come next. The next sentence is S because it contains a transitional word, “however,” and a substitute for “banjo” (“stringed instrument”). Write “2” in the blank before S. S also contains a reference to stringed instruments in Arab countries, and Arab traders are mentioned in T, so T follows S. Write “3” before T. U begins with “at any rate,” a transition that moves the story along, and ends with the arrival of the banjo in North America, so U follows T. Write “4” before U. Q refers to “our continent,” which is North America, so Q follows U. Write “5” before Q. The final sentence, R, describes the changes mentioned in Q, so it is a logical concluding sentence. Write “6” before R.

Now write out the letters of the sentences in order — STUQR—and then read the sentences in this order to see if they form a coherent, grammatically correct paragraph. If they do not, ask yourself why. For example, suppose you ordered the sentences SQRTU. When read in this order, the paragraph seems to hang in mid-air after the end of U, indicating that it may not be correct. Go back to

see whether a sentence should come after U. Q is that sentence, for the reasons given above. Change the numbers to reflect your new order.

Five sentences are not very many with which to create a well-organized paragraph that can stand alone, without the context that a longer work provides. Thus, the position of each sentence within a relatively short paragraph is very important. When a paragraph is factual and explanatory in nature, as this one is, a good writer presents ideas, facts, definitions, and relationships in a precise and orderly way.

Note that the correct ordering depends on the logical sequence of ideas and/or the grammatical cues provided by transitional words or phrases. A strict chronological ordering is incorrect if the grammatical cues are ignored. Base your

**EXAMPLE 1**

No one knows when or where the first banjo was created.

- 5 Q. Once on our continent, it has undergone many changes and appeared in various forms.
- 6 R. For example, the number of banjo strings has varied between two and five, with five strings being standard today.
- 2 S. However, similar stringed instruments have been played in Indian and Arab countries for thousands of years.
- 3 T. Arab traders may have brought the instrument from Asia to the west coast of Africa.
- 4 U. At any rate, in the eighteenth century, the banjo arrived in North America, along with enslaved Africans.

**Example 1**

- The second sentence is      Q R ● T U
- The third sentence is      Q R S ● U
- The fourth sentence is      Q R S T ●
- The fifth sentence is      ● R S T U
- The sixth sentence is      Q ● S T U

ordering only on the information provided. Assume that the paragraph stands alone and is not part of a larger work.

Some sentence orders may be partially correct, with two or more sentences in proper order. Unless all five sentences are ordered correctly, however, the ordering is incorrect.

**No credit is given for partially correct responses.**

## LOGICAL REASONING

This section consists of 10 questions that assess your ability to reason logically, using the facts, concepts, and information presented. **You must guard against jumping to conclusions that are not warranted from the information given.** There are different types of questions: figuring out codes, determining the relative positions of things or people, identifying correct assumptions, and drawing valid conclusions.

### EXAMPLE 2

In this example, Questions 1 and 2 refer to the information below.

There are five bookshelves on the wall. The bottom shelf is Shelf 1, the top shelf is Shelf 5. Each shelf is filled with books of one color.

- 1) The red books are above the green books.
- 2) The yellow books are below the blue books.
- 3) The orange books are between the red books and the yellow books.
- 4) The yellow books are on Shelf 2.

1. Which color books are on Shelf 1?
  - A. red
  - B. green
  - C. blue
  - D. orange
  - E. Cannot be determined from the information given.
2. Which color books are on Shelf 5?
  - F. red
  - G. green
  - H. blue
  - J. orange
  - K. Cannot be determined from the information given.

The most important strategy is to read the information carefully and make no assumptions that are not supported by the given information. Certain words must be read carefully. For example, **between** cannot be assumed to mean **between and right next to**; other things may be between these two objects as well. The same may be true of words such as **above, below, before, and after.**

Another good strategy is to look for information that is definitely stated, such as, “The red box is the largest,” or “Jane is not standing next to Erik.” This information makes it easier to determine the relative relationships.

At times, drawing a chart may help you visualize how the parts of the problem are related. **Example 2** shows how this strategy can be helpful. First, draw and number the five shelves. Then, look for information that is definite, such as statement 4, the yellow books are on Shelf 2. Write “yellow” next to “2.”

For **Question 1**, note that the blue books are above the yellow books (statement 2). From statement 3, the red and orange books are either both **above** the yellow books or both **below** them. There is only one shelf below the yellow books. The red and orange books cannot both be below the yellow books. That leaves only the green books for Shelf 1. The correct answer is B.

For **Question 2**, note that the orange, red, and blue books must occupy Shelves 3, 4, and 5. Statement 3 says that the orange books are below the red books. No further information is given that allows us to determine the exact positions of the orange, red, and blue books. We know only that red or blue books are on Shelf 5. Hence the correct answer is K.

It is important to realize that more than one arrangement may satisfy the conditions. For example, the arrangement below satisfies all conditions given in statements 1-4. However, “blue” is not the correct answer because **it is not the only arrangement that satisfies the conditions.** Based on the information given, other arrangements could be possible.

Shelf	Color of Book
5	blue
4	red
3	orange
2	yellow
1	green

### EXAMPLE 3

All of the officers at the air show were pilots. Some pilots at the air show wore their uniforms.

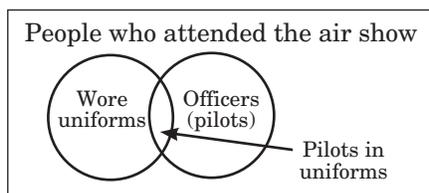
Based only on the information above, which of the following **must** be true?

- A. All persons wearing uniforms at the air show were pilots.
- B. Only pilots attended the air show.
- C. If Zelda was an officer at the air show, then she must be a pilot.
- D. All of the officers at the air show wore their uniforms.
- E. If Peter was a pilot at the air show, then he wore his uniform.

To answer [Example 3](#) correctly, it is important to understand the relationships among the groups of people who attended the air show—officers, pilots, and pilots who wore their uniforms. It is also necessary to realize that some people who attended the air show might not belong to any of these groups. The question says that all officers were pilots, and that some pilots (not all) wore their uniforms. This is the extent of the information given about the officers and pilots who attended.

Read each option and evaluate whether it **must be** true, based on the information given. Option A may or may not be true; the persons wearing uniforms may or may not be pilots. There is not enough information given to decide. Option B is incorrect because it is possible that people other than pilots attended the air show. The information given does not rule out that possibility. Option C says that an officer who attended the air show (Zelda) must be a pilot. According to the information given, this conclusion **must be** true. Options D and E can be ruled out because the officers and pilots may or may not have worn their uniforms.

It might be helpful to draw a diagram to illustrate the relationships among the groups of people at the air show.



The overlapping circles in the diagram show that some pilots (and officers) wore uniforms, but not necessarily all of them. It also shows that some people wearing uniforms may **not be** pilots or officers. The diagram can be used to rule out Options A, B, D, and E, and to support Option C as the correct answer.

### EXAMPLE 4

In the code below, (1) each letter always represents the same word, (2) each word is represented by only one letter, and (3) in any given sentence, the letters may or may not be presented in the same order as the words.

L	N	Q	R	V	means
"Ben	wants	to	date	Tasha."	
N	Q	R	W	Z	means
"Alicia	wants	to	date	Gabe."	
L	N	Q	R	Z	means
"Gabe	wants	to	date	Tasha."	
N	Q	R	V	Y	means
"Jaclyn	wants	to	date	Ben."	

1. Which letter represents the word "Ben"?

- A. L
- B. V
- C. Q
- D. R
- E. Y

2. Which word is represented by the letter W?

- F. Alicia
- G. wants
- H. to
- J. date
- K. Gabe

When the question involves a code, as in Example 4, do not solve for all parts of the code. Solve only those parts that relate to the question.

To answer [Question 1](#), start by ruling out the letters that mean "wants to date," since they are the only words that appear in all four sentences. "Wants to date" must be represented by the letters N, Q, and R. (We do not know which word corresponds to each letter, but it does not matter. We are interested only in solving for "Ben.") Then go back to the first and fourth sentences (the only sentences that contain "Ben") and eliminate those letters from consideration. The remaining letters are V, L, and Y. Only V appears in both sentences, as does only one word, "Ben." Thus we can conclude that V means "Ben," which is Option B.

To answer [Question 2](#), notice that the letter W appears in only one sentence, the second. The letters N, Q, and R represent "wants to date," so W cannot represent any of those words. The remaining letters in the sentence are W and Z, which must represent "Alicia" and "Gabe." "Alicia" appears in only the second sentence, while "Gabe" appears in the third sentence as well. W appears only once in the code, while Z also appears in the third sentence. Thus the letter W must represent "Alicia," which is Option F.

## READING

This section measures your ability to read and comprehend English prose. There are five passages with six questions each. Each passage is 350 to 450 words long. The subjects include short biographies, discussions of historical events, descriptions of scientific phenomena, brief essays on art or music, discussions with a point of view, and human interest stories. There are no fictional passages.

For each passage, one question will always assess your understanding of the main idea of the passage. Other questions will ask about factual details and inferences that can be drawn.

You may read the questions first, but do not attempt to answer the questions without reading the passage. It is also unwise to skim the passage instead of reading it carefully; you are likely to make inaccurate assumptions if you base them on only a few words or a short phrase. Often, the correct

answer requires combining information from different parts of the passage. Since there will always be a question asking what the passage is about, try to formulate the answer by the time you have finished reading the passage. Likewise, try to answer each question before reading the choices. Then look at the choices to see which is closest to your answer. If none seems to be your answer, read the question again. You may reread the passage before you choose your answer.

Be wary of choices that are too broad or too narrow.

Ask yourself whether the question requires you to draw a conclusion or inference from statements in the passage or simply to identify a restatement of the facts.

Base your answers only on the information presented in the passage. Do not depend solely on your prior knowledge of the topic. Enough information will be given for you to arrive at the correct answer. See the sample reading passage below.

### EXAMPLE 5

In the 1940s and 1950s, millions cheered for the first and, so far, the only professional female baseball league in the United States. Concerned that major-league teams might be  
5 shut down because players were being drafted to serve in World War II, Philip K. Wrigley, owner of the major-league Chicago Cubs, chose the finest players from the amateur women's softball leagues and established the  
10 American All-Girl Professional Baseball League (AAGPBL) in 1943. The quality of play in the women's league was so high that the games attracted many loyal fans in a number of Midwestern cities. In fact, in the  
15 best year of the league, over a million spectators attended AAGPBL games. Public interest fluctuated over the years, however, and when television brought major-league baseball into people's homes in the 1950s, it wiped  
20 out the AAGPBL and many other minor league operations as well.

That most people had sexist attitudes toward women's athletics is evident from some of the team names, most of which alluded more to  
25 gender and appearance (Chicks, Peaches) than ballplaying skills. But in their six games a week (two on Sundays), the women demonstrated that they were true athletes. The league quickly advanced from a modified  
30 form of softball to a serious game of baseball.

The women played hard and well, and major-league players and managers spoke highly of the league. One Hall of Famer called the thrilling, fourteen-inning championship game  
35 in 1946 the greatest he had ever witnessed, male or female.

When the league folded in 1955, the players went in many directions. Some pursued successful careers in business. Some took up  
40 other professional sports such as bowling and golf. The groundbreaking efforts of the AAGPBL paved the way for the success and popularity of women in sports such as tennis, golf, and track and field. These efforts also  
45 helped to increase the financial rewards available to women in professional sports. In 1989, a well-attended Baseball Hall of Fame exhibit brought the players of the league some much-deserved recognition for their con-  
50 tributions to baseball and to women's sports in general.

In 1992, a feature film about the league, *A League of Their Own*, may have spurred new interest in women's baseball. In 1994  
55 the Colorado Silver Bullets became the first women's professional baseball team to compete only against men. They played four full seasons of exhibition games against minor-league and semi-pro men's teams.

EXAMPLE 5 *continued*

1. Which of the following best tells what this passage is about?
  - A. why women no longer play professional baseball
  - B. the early years of women in professional sports
  - C. the history and significance of women's professional baseball
  - D. attitudes toward women in professional sports
  - E. the effect of World War II on professional sports
2. Which of the following is **not** true of the women in the AAGPBL?
  - F. They replaced the male players in the major leagues.
  - G. They played baseball with determination and skill.
  - H. Some of them played in other sports.
  - J. Their accomplishments were recognized by the Baseball Hall of Fame.
  - K. Major-league players and managers admired their skills.
3. What was the major reason for the end of the professional women's baseball league?
  - A. The AAGPBL began using male ballplayers during the 1950s.
  - B. Women no longer competed against men after the war was over.
  - C. All-male minor leagues cut into the AAGPBL market.
  - D. People lost interest in baseball during the 1950s.
  - E. Baseball fans lost interest in minor-league baseball during the 1950s.
4. What was Philip K. Wrigley's chief motivation in starting the league?
  - F. a desire to publicize his major-league team
  - G. a desire to keep wartime morale high among women
  - H. a belief in the long-term future of women's participation in baseball
  - J. a desire to keep baseball available despite the war
  - K. a fear that fans would lose interest in professional sports
5. What is the major difference between the Silver Bullets and the teams of the AAGPBL?
  - A. The Silver Bullets played baseball instead of softball.
  - B. The Silver Bullets played only male teams.
  - C. The AAGPBL played only a modified softball.
  - D. The Silver Bullets were professional athletes.
  - E. The AAGPBL games were on television.
6. The author described the AAGPBL's efforts as "groundbreaking" (line 41) because the league
  - F. taught many women to play baseball.
  - G. made professional baseball a popular sport.
  - H. introduced baseball to cities that previously had no teams.
  - J. inspired women to join major-league teams.
  - K. showed that women could participate in professional sports.

### ► QUESTION 1

This question asks for the option that best tells what the passage is about. Look at each paragraph. The first paragraph describes the founding of the AAGPBL, its peak of popularity, and its end. The second paragraph contrasts sexist attitudes toward women’s athletics with the women’s excellent ballplaying skills. The third paragraph describes what the women did after the league folded in 1955. The last paragraph discusses renewed interest in women’s baseball. Now look at the answer choices.

Option A cannot be correct because the passage provides no information about whether or not women currently play professional baseball. The fourth paragraph only states that the Silver Bullets were the **first** professional team to play against men. Option B is too broad; the passage focuses on women in baseball, not professional sports in general. Options D and E can be ruled out because, while they are mentioned in the passage, they are details, not main ideas. Option C is correct because it is neither too narrow nor too broad, and it summarizes the main points of the passage—the history of the league and the effects of the league on women’s participation in professional sports.

### ► QUESTION 2

This question asks you to select the choice that is not true of the women in the AAGPBL. The best strategy for a question like this is to evaluate each option and determine whether it is true. Only one choice will **not** be true. Option F is not true; the women were in their own league (lines 4-11). Option G is true; the women played hard and well (line 31). Option H also is true, based on the third paragraph, which says that some players became professional bowlers and golfers. Option J is supported by the last sentence in the third paragraph. Option K also is true; major-league players and managers spoke highly of the league (lines 31-33).

### ► QUESTION 3

The end of the AAGPBL is described in lines 18-21: “. . . when television brought major-league baseball into people’s homes in the 1950s, it wiped out the AAGPBL and many other minor-league operations as well.” The option closest in meaning is Option E. The remaining options may sound plausible, but none are true.

### ► QUESTION 4

This question asks for an inference based on information in the passage, but which is not directly stated. The answer must be drawn from the first paragraph, the only place where Wrigley is mentioned. The passage says that Wrigley started the AAGPBL because he was “concerned that major-league teams might be shut down because players were being drafted to serve in World War II.” The inference to be made is that Wrigley started another baseball league, entirely composed of women who were not likely to enter the armed services, to help ensure that his business would continue if major-league baseball ended. Option J restates that inference and is the correct answer. Option F is not supported by the passage. While Option G may have been an outcome of Wrigley’s decision, it was not the motivating factor. Option H is incorrect; Wrigley’s concern was for the duration of the war, not long-term. Option K is unlikely, given the status of major-league baseball before the war and the lack of information about other professional sports during the war.

### ► QUESTION 5

The answer is found in the last sentence. The Silver Bullets were the first women’s professional baseball team to have competed against men, as stated in Option B, the correct answer. The other options do not describe differences between the teams. The AAGPBL teams played baseball (lines 29-30), ruling out Options A and C; the AAGPBL players were professional athletes, ruling out Option D; and there is no mention of the AAGPBL teams or the Silver Bullets’ games appearing on television, ruling out Option E.

### ► QUESTION 6

To answer this question, you must read more than the sentence containing the word “groundbreaking.” Reread the third paragraph to figure out how it fits into the passage. The passage implies that the league helped women attain the status of professional athletes for the first time. “Groundbreaking” is thus used in the sense of “pioneering.” The option that corresponds best to this idea is K.

*This section includes arithmetic, algebra, probability, statistics, and geometry problems. The technical terms and general concepts in these test questions can be found in the New York State Education Department **Mathematics Resource Guide with Core Curriculum**. Most problems involve application of topics covered in the **Core Curriculum**; however, since the **Core Curriculum** is just an outline, not all details of a topic are provided. Consequently, some aspects of a question may not be mentioned. Also, knowing how to respond to novel situations creatively is an important indication of mathematical ability. 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 on unfamiliar topics. The **NYSED Mathematics Resource Guide with Core Curriculum** can be downloaded from the New York State Education Department website: [www.nysed.gov](http://www.nysed.gov).*

## Tips for Taking the Mathematics Section of the SHSAT

To improve your mathematics skills, choose a mathematics textbook and solve five to ten problems every day. Do both routine and difficult problems. Routine problems reinforce basic mathematical facts. More challenging problems help you understand mathematics concepts better. Do not give up if you cannot complete some of the problems. Skip them and move on. You may be able to solve them after you have learned more. Also, do not limit yourself to problems that test what you have learned in your mathematics class only. Go beyond what you have been taught and try new types of problems.

- ▶ You must **know the meanings of technical terms** such as “parallel” and “perpendicular” that are appropriate to your grade level, as well as the customary symbols that represent those terms. You also need to **know various formulas** such as those for the perimeter and area of different figures. You can find these technical terms, symbols, and formulas in your mathematics textbook or in the Core Curriculum. These terms, symbols, and formulas will **NOT** be given in the test booklet. Practice using them until you know them by heart.
- ▶ Read each problem carefully and work out the answer on scrap paper or in your test booklet. **Do not calculate on your answer sheet.**
- ▶ Most problems 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 often is helpful to **express it as an equation**. 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.
- ▶ The incorrect choices are often answers that people get if they misread the question or make common computational errors. For this reason, it is unwise to solve a problem in your head while looking at the possible choices. It is too easy to be attracted to a wrong choice.
- ▶ If your answer is not among the answer choices, write your answer in a different form. For example,  $10(x + 2)$  is equivalent to  $10x + 20$ .
- ▶ You may draw figures or diagrams for questions that do not have them.
- ▶ Some questions ask you to combine a series of simple steps. Take **one step at a time**, using what you know and what the question tells you to do.
- ▶ The sample tests in this handbook are Grade 8 forms. If you are taking the Grade 9 test, work the problems on pages 99–103 as well. These problems cover topics that are introduced in the Core Curriculum for Grade 8.

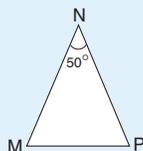
**EXAMPLE 6**

Tara flew her plane at an average speed of 310 kilometers per hour for  $4\frac{1}{2}$  hours. About how far did she travel?

- A. 300 km
- B. 500 km
- C. 1,500 km
- D. 3,000 km
- E. 4,500 km

**IN EXAMPLE 6**, multiply 310 by  $4\frac{1}{2}$  to get 1,395 km. However, since the question asks for an estimate (“about how far”), you can round 310 to 300, and multiply 300 by 4.5 to obtain 1,350. Now look at the choices. We have rounded 310 down, so the correct answer should be slightly larger than 1,350. Option C is correct.

**EXAMPLE 7**



In triangle MNP,  $MN = NP$ . What is the measure of  $\angle M$ ?

- F.  $45^\circ$
- G.  $50^\circ$
- H.  $65^\circ$
- J.  $75^\circ$
- K.  $130^\circ$

**IN EXAMPLE 7**, you must know that the sum of the interior angles of a triangle is  $180^\circ$ . Since  $MN = NP$ , triangle MNP is an isosceles triangle. Therefore, the measures of  $\angle M$  and  $\angle P$  are equal. Let  $x$  be the measure of  $\angle M$  and  $\angle P$ . Then:

$$\begin{aligned} 2x + 50 &= 180 \\ 2x &= 130 \\ x &= 65 \end{aligned}$$

**EXAMPLE 8**

If  $\frac{2m-3}{9} = 7$ , what is the value of  $m$ ?

- A. 2
- B. 8
- C. 10
- D. 30
- E. 33

**IN EXAMPLE 8**,  $\frac{2m-3}{9} = 7$

$$\begin{aligned} 2m - 3 &= 7 \cdot 9 = 63 \\ 2m &= 63 + 3 = 66 \\ m &= 33 \end{aligned}$$

**EXAMPLE 9**

What is the smallest positive odd integer that is **not** immediately adjacent to an integer power of 2?

- F. 1
- G. 3
- H. 5
- J. 11
- K. There is no such number.

**IN EXAMPLE 9**, start by listing the positive powers of 2:

$$\begin{aligned} 2 &= 2 \\ 2^2 &= 4 \\ 2^3 &= 8 \\ 2^4 &= 16 \\ 2^5 &= 32 \end{aligned}$$

The question asks for the smallest positive odd integer that is **not** immediately adjacent to one of the quantities on the right-hand side of the equations above. Start with 1, the smallest positive odd integer. It cannot be the answer, since it is immediately adjacent to 2. The next several positive odd integers, 3, 5, 7, and 9, are ruled out because they are immediately adjacent to 2, 4, 8, and 8, respectively. The smallest positive odd integer that meets the requirements is 11; it is between 8 and 16, but not immediately adjacent to either.

**Taking the Sample Tests**

Now you are ready to try sample test Form A. Begin by carefully reading the Directions on pages 26 and 27 and filling out side 1 of the Answer Sheet on page 28. For Form A, use side 2 of the Answer Sheet (page 29). When you are ready for Form B, use the Answer Sheet on page 65. You may tear out pages 29 and 65 to make it easier to mark your answers.

# NEW YORK CITY PUBLIC SCHOOLS

## 2008 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 am a Grade 8 student taking a Grade 8 test. I understand that a student 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 above 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 the name and borough of the school where you are now enrolled. On **Line 3**, print today's date, using the numbers of the month, the day, and the year. On **Line 4**, 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, March 1, 1994, would be 3-1-94.

In **Grid 5**, 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 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 in your name, or a hyphen, fill in the circles under the 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 6** is for your choice of specialized high schools. If Grid 6 is not marked correctly, your admission to a specialized high school will be affected because your admission is based on the score you attain and the order in which you rank your school preferences. Therefore, carefully copy the order in which you ranked the schools on your admission ticket onto Grid 6.

**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 at least 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.

In **Grid 7**, fill in the circle that identifies your sex.

**Grid 8** is labeled "TEST BOOKLET NUMBER." In the boxes, copy the letter and numbers shown in the upper-right corner of your test booklet. Below each box, fill in the circle containing the same letter or number as the box.

In **Grid 9**, print the name and the borough of the school where you are now enrolled. Then, under "BOROUGH," fill in the circle for the borough in which your school is located. If you attend a public school, fill in the circle next to "NYC Public." If you attend a private or parochial school, fill in the circle next to "Private or Parochial." In the boxes marked "SCHOOL CODE," print the five-digit number that identifies your school. Then fill in the corresponding circles. If you attend a private or parochial school, fill in the circled "P" in the box marked "LETTER." Your school code should be recorded on your admission ticket. If it is not, you or the proctor should look in the Feeder School List under the borough in which your school is located to find the code for your school. Copy this code carefully onto Grid 9 and fill in the correct circles.

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

## GENERAL DIRECTIONS, continued

**Grid 10** is labeled “STUDENT ID NUMBER.” This number is for New York City public school students **only**. The student ID number is found on your admission 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. **Private and parochial school students should leave this grid blank.**

**Grid 11** 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 last two digits of the year in the last box. Then fill in the corresponding circles.

Now review this page 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; your name, first name **first**; and your home address and phone number in the spaces provided.

### Marking Your Answers

Be sure to mark all your answers in the row of answer circles corresponding to the question number printed in the test booklet. Use a Number 2 pencil. If you change an answer, be sure to erase it completely. **You may write in your test booklet to solve verbal or mathematics problems, but your answers must be recorded on the answer sheet in order to be counted.** 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. Select the **best** answer for each question. Your score will be the number of questions you answered correctly. **It is to your advantage to answer every question, even though you may not be certain which choice is correct.** See the example of correct and incorrect answer marks at the top of the next column.

SAMPLE ANSWER MARKS						
1	(A)	(B)	(C)	(D)	●	RIGHT
2	✓	(B)	(C)	(D)	(E)	WRONG
3	(F)	✗	(H)	(J)	(K)	WRONG
4	(A)	(B)	●	(D)	(E)	WRONG
5	(F)	(G)	●	●	(K)	WRONG

### Planning Your Time

You have 150 minutes to complete the entire test. How you allot the time between the Verbal and Mathematics sections is up to you. **If you begin with the Verbal 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 Verbal section as soon as you are ready.** It is recommended that you do not spend more than 75 minutes on either section. If you complete the test before the allotted time (150 minutes) is over, you may go back to review questions in either section.

Work as rapidly as you can without making mistakes. Don't spend too much time on a difficult question. Return to it later if you have time.

Students must remain for the entire test session.

### Example 1

**DIRECTIONS:** Solve the problem. Find the **best** answer among the answer choices given.

- E1.** If four ice cream cones cost \$2.00, how much will three ice cream cones cost?
- A. \$0.50
  - B. \$1.00
  - C. \$1.25
  - D. \$1.50
  - E. \$1.75

AA

EXAMPLE ANSWER					
E1.	(A)	(B)	(C)	●	(E)

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





Student's First Name (please print)

Student's Last Name (please print)

Student's Home Address      Apartment      Borough      ZIP Code      (Area Code)      Home Telephone Number

**PART I VERBAL**

**SCRAMBLED PARAGRAPHS**

**Paragraph 1**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 2**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 3**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 4**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 5**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**LOGICAL REASONING**

- |                          |                          |
|--------------------------|--------------------------|
| 11 A    B    C    D    E | 33 A    B    C    D    E |
| 12 F    G    H    J    K | 34 F    G    H    J    K |
| 13 A    B    C    D    E | 35 A    B    C    D    E |
| 14 F    G    H    J    K | 36 F    G    H    J    K |
| 15 A    B    C    D    E | 37 A    B    C    D    E |
|                          | 38 F    G    H    J    K |
| 16 F    G    H    J    K |                          |
| 17 A    B    C    D    E | 39 A    B    C    D    E |
| 18 F    G    H    J    K | 40 F    G    H    J    K |
| 19 A    B    C    D    E | 41 A    B    C    D    E |
| 20 F    G    H    J    K | 42 F    G    H    J    K |
|                          | 43 A    B    C    D    E |
|                          | 44 F    G    H    J    K |

**READING**

- |                          |                          |
|--------------------------|--------------------------|
| 21 A    B    C    D    E | 45 A    B    C    D    E |
| 22 F    G    H    J    K | 46 F    G    H    J    K |
| 23 A    B    C    D    E | 47 A    B    C    D    E |
| 24 F    G    H    J    K | 48 F    G    H    J    K |
| 25 A    B    C    D    E | 49 A    B    C    D    E |
| 26 F    G    H    J    K | 50 F    G    H    J    K |
|                          |                          |
| 27 A    B    C    D    E |                          |
| 28 F    G    H    J    K |                          |
| 29 A    B    C    D    E |                          |
| 30 F    G    H    J    K |                          |
| 31 A    B    C    D    E |                          |
| 32 F    G    H    J    K |                          |

**PART II MATHEMATICS**

**MATHEMATICS PROBLEMS**

- |                          |                          |                          |                           |
|--------------------------|--------------------------|--------------------------|---------------------------|
| 51 A    B    C    D    E | 66 F    G    H    J    K | 81 A    B    C    D    E | 96 F    G    H    J    K  |
| 52 F    G    H    J    K | 67 A    B    C    D    E | 82 F    G    H    J    K | 97 A    B    C    D    E  |
| 53 A    B    C    D    E | 68 F    G    H    J    K | 83 A    B    C    D    E | 98 F    G    H    J    K  |
| 54 F    G    H    J    K | 69 A    B    C    D    E | 84 F    G    H    J    K | 99 A    B    C    D    E  |
| 55 A    B    C    D    E | 70 F    G    H    J    K | 85 A    B    C    D    E | 100 F    G    H    J    K |
|                          |                          |                          |                           |
| 56 F    G    H    J    K | 71 A    B    C    D    E | 86 F    G    H    J    K |                           |
| 57 A    B    C    D    E | 72 F    G    H    J    K | 87 A    B    C    D    E |                           |
| 58 F    G    H    J    K | 73 A    B    C    D    E | 88 F    G    H    J    K |                           |
| 59 A    B    C    D    E | 74 F    G    H    J    K | 89 A    B    C    D    E |                           |
| 60 F    G    H    J    K | 75 A    B    C    D    E | 90 F    G    H    J    K |                           |
|                          |                          |                          |                           |
| 61 A    B    C    D    E | 76 F    G    H    J    K | 91 A    B    C    D    E |                           |
| 62 F    G    H    J    K | 77 A    B    C    D    E | 92 F    G    H    J    K |                           |
| 63 A    B    C    D    E | 78 F    G    H    J    K | 93 A    B    C    D    E |                           |
| 64 F    G    H    J    K | 79 A    B    C    D    E | 94 F    G    H    J    K |                           |
| 65 A    B    C    D    E | 80 F    G    H    J    K | 95 A    B    C    D    E |                           |

# SAMPLE TEST, FORM A

## PART 1 — VERBAL

*Suggested Time — 75 Minutes*

45 QUESTIONS

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### SCRAMBLED PARAGRAPHS

PARAGRAPHS 1-5

**DIRECTIONS:** In this section, arrange each group of sentences to create the best paragraph. The first sentence for each paragraph is given; the remaining five sentences are listed in random order. Choose the order for these five sentences that will create the **best** paragraph, one that is well-organized, logical, and grammatically correct. Each correctly ordered paragraph is worth double the value of a question in any other section of the test. No credit will be given for responses that are only partially correct.

To keep track of your sentence order, use the blanks to the left of the sentences. For example, write “2” next to the sentence you think follows the first sentence, “3” next to the sentence you think follows “2,” and so on. You may change these numbers if you decide on a different order. When you are satisfied with your sentence order, mark your choices on your answer sheet.

---

#### Paragraph 1

Chinese sailors used magnetic compasses long before Europeans did.

- \_\_\_\_\_ **Q.** Then, hanging in a windless place, the magnetized end of the needle would always point to the south.
- \_\_\_\_\_ **R.** The magician would magnetize a needle and balance it on the rim of a cup to act as a compass.
- \_\_\_\_\_ **S.** This balancing act was hard to maintain, and the needle often fell off.
- \_\_\_\_\_ **T.** In fact, some of the earliest compasses in recorded history were made by “magicians” in ancient China.
- \_\_\_\_\_ **U.** A more effective way to keep the needle free to move in response to its magnetic pull was to attach a strand of silk to the center of the needle with a tiny piece of wax.

CONTINUE ON TO THE NEXT PAGE ►

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**Paragraph 2**

In the west, we are most familiar with world explorers who were of European origin.

- \_\_\_\_\_ **Q.** Marco Polo, a European who traveled to China in the thirteenth century, serves as a classic example.
- \_\_\_\_\_ **R.** Perhaps the most far-flung of these lesser known travelers was Ibn Batuta, a North African who left his birthplace of Tangier in the year 1325.
- \_\_\_\_\_ **S.** Ibn Batuta traveled all over Africa and Asia, including China, Indonesia, the Maldiv Islands, and the coast of East Africa.
- \_\_\_\_\_ **T.** Some lesser known explorers, however, logged enough miles and adventures to make Marco Polo's journey look like an evening stroll.
- \_\_\_\_\_ **U.** Batuta's journeying lasted 24 years and covered at least 75,000 miles, most of it by land, a record that would not be surpassed for another 500 years.

---

**Paragraph 3**

The processionary caterpillar illustrates how an insect species relies on instinct in its daily routines.

- \_\_\_\_\_ **Q.** Dozens of caterpillars nest in a tree during the day, then leave together at night in search of food.
- \_\_\_\_\_ **R.** After feeding, the caterpillars also use the silken "road" to help them return to their nest.
- \_\_\_\_\_ **S.** As they leave the nest, one caterpillar becomes the leader who spins and lays out a silk line as it moves along.
- \_\_\_\_\_ **T.** The processionary's instinct is so strong that, if a person were to pick up one end of the silk line and bring it around to join the other end, creating a closed circle, the caterpillars might travel around the loop for days without changing course.
- \_\_\_\_\_ **U.** The other caterpillars line up end to end and walk on the leader's silk line, each one reinforcing the rope by laying down its own silk as it passes over.

CONTINUE ON TO THE NEXT PAGE ►

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**Paragraph 4**

Helen Suzman was a member of the South African Parliament from 1953 to 1993.

- \_\_\_\_\_ **Q.** Despite this international recognition of her work, Suzman was largely unsuccessful during most of her career in her efforts to defeat apartheid.
- \_\_\_\_\_ **R.** She has, however, been given numerous other human-rights awards and honorary degrees from several universities, including Oxford, Harvard, and Brandeis.
- \_\_\_\_\_ **S.** At last, Suzman saw her dream fulfilled with the decision of the South African Parliament to dismantle the apartheid system, and she has retired from public life.
- \_\_\_\_\_ **T.** In recognition of her personal efforts, Suzman was nominated for the Nobel Peace Prize three different times, but she has never won.
- \_\_\_\_\_ **U.** An outspoken critic of apartheid during those forty years, she was often the only one to voice her protest against the policies of the South African government.

---

**Paragraph 5**

Jules Verne wrote about travel to the moon more than 100 years ago, but he was not the first writer to do so.

- \_\_\_\_\_ **Q.** Three hundred years before Verne, Johannes Kepler, probably the first scientist to recognize that the atmosphere of the Earth gave out before reaching the moon, wrote about an imaginary trip there.
- \_\_\_\_\_ **R.** Thus, while Jules Verne is credited with writing the first “realistic” science fiction, it is clear that space travel has haunted people’s imaginations for centuries.
- \_\_\_\_\_ **S.** Even earlier, in A.D. 1010, a Persian poet described a trip to the moon on a throne pulled by eagles.
- \_\_\_\_\_ **T.** Perhaps credit for the first space flight description, however, should go to a second-century Greek whose fictional sailing ship was caught up in a whirlwind that blew it to the moon.
- \_\_\_\_\_ **U.** A contemporary of Kepler’s, Francis Godwin, wrote of men carried to the moon by geese.

CONTINUE ON TO THE NEXT PAGE ►

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# LOGICAL REASONING

## QUESTIONS 11-20

**DIRECTIONS:** Read the information given and choose the **best** answer to each question. Base your answer **only on the information given**.

In a logical reasoning test, certain words must be read with caution. For example, “The red house is **between** the yellow and blue houses” does not necessarily mean, “The red house is **between and next to** the yellow and blue houses”; one or more other houses may separate the red house from the yellow house or from the blue house. This precaution also applies to words such as **above, below, before, after, ahead of, and behind**.

---

11. Five plastic geometric shapes are stacked on the table. They are numbered consecutively from bottom to top.

- 1) One shape is a triangle.
- 2) The circle is the fourth shape.
- 3) There are exactly three shapes between the rectangle and the square.
- 4) There are exactly two shapes lower than the oval; one of them is the rectangle.

In which position is the triangle?

- A. second
- B. third
- C. fourth
- D. fifth
- E. Cannot be determined from the information given.

12. A species is extinct when it no longer has any living members. Scientists thought that fish species X was extinct. In 1980, a fisherman caught a living member of species X. This species is now known to live in large numbers in the near-freezing water of the north Atlantic Ocean.

Based only on the information above, which of the following statements is a valid conclusion?

- F. Species X was never actually extinct.
- G. Species X was extinct, but reappeared in 1980.
- H. Species X has been discovered, but will soon become extinct.
- J. There are other living species that are thought to be extinct.
- K. Living members of extinct species are found only in the ocean.

CONTINUE ON TO THE NEXT PAGE ►

- 
- 13.** At the lumberyard, five boards are stacked in a pile. The pile contains one board each of maple, ash, oak, pine, and walnut.
- 1) The maple board is lower in the stack than the walnut board.
  - 2) Exactly two boards are between the walnut board and the oak board.
  - 3) The ash board is third from the top.

If the top board is walnut, which board is on the bottom?

- A.** pine
  - B.** maple
  - C.** oak
  - D.** Either pine or maple, but it is not possible to determine which one.
  - E.** Either maple or oak, but it is not possible to determine which one.
- 

- 14.** People who graduate from North College are expected to donate at least \$500 per year to the school. Sydney donates \$100 per year to North College.

Based only on the information above, which of the following **must** be true?

- F.** Sydney did not graduate from North College.
- G.** If Sydney earned more money, she would donate more to the college.
- H.** If all graduates donated only \$100 per year, North College could not continue to operate.
- J.** If Sydney graduated from North College, she does not do what is expected of her.
- K.** Sydney contributes other services to North College to compensate for her lower financial contribution.

- 
- 15.** At the end of an auto race, four cars crossed the finish line, one at a time. The four cars were blue, green, red, and yellow.

- 1) Jennifer finished directly behind Pierre.
- 2) The red car finished before the green car.
- 3) Charles was not in the blue car.
- 4) Pierre was in the red car.
- 5) Stephanie, who was in the yellow car, finished after Jennifer.

Based only on the information above, which of the following statements **must** be true?

- A.** The blue car finished before the green car.
  - B.** Charles finished third.
  - C.** Jennifer drove the green car.
  - D.** Stephanie finished third.
  - E.** The green car finished second.
- 

- 16.** Six potted houseplants are placed in a row. There are four varieties: African violet, fern, ivy, and pothos. There are two pots each of two varieties and one pot each of the other two varieties.

- 1) There are two ivy plants and exactly one African violet.
- 2) Two ferns are separated only by a pothos.
- 3) An ivy plant is next to the African violet.
- 4) A fern is next to the African violet.

Which houseplants are at the ends of the row?

- F.** fern and ivy plant
- G.** pothos and fern
- H.** fern and African violet
- J.** two ivy plants
- K.** Cannot be determined from the information given.

CONTINUE ON TO THE NEXT PAGE ►

- 
17. Every member of club X is also a member of club Y. Some members of club Z are also members of club Y. Sonya is a member of exactly two of these clubs.

Based only on the information above, which of the following **must** be true?

- A. If Sonya is in club X, she is not in club Z.
- B. If Sonya is in club Y, she is not in club Z.
- C. If Sonya is in club Y, she must be in club X.
- D. All members of club Y are in at least two clubs.
- E. All members of club Z are in at least two clubs.

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Questions 18 and 19 refer to the following information.

In the code below, (1) each letter always represents the same word, (2) each word is represented by only one letter, and (3) in any given sentence, the position of a letter is **never** the same as that of the word it represents.

M Q T N W means  
“This train crosses seven states.”

N X Q M W means  
“This train crosses five states.”

W S N Q X means  
“This train crosses five countries.”

18. Which letter represents the word “states”?

- F. X
- G. N
- H. Q
- J. W
- K. M

19. Which word is represented by the letter W?

- A. this
- B. train
- C. crosses
- D. Either “this” or “train,” but cannot determine which one.
- E. Either “train” or “crosses,” but cannot determine which one.

- 
20. If the moon is full, my dog will bark. If my dog sees a cat, my dog will bark.

Based only on the information above, which of the following **must** be true?

- F. If my dog barks, it has seen a cat and the moon is full.
- G. If my dog barks, it has seen a cat.
- H. If my dog doesn’t bark, it has not seen a cat and the moon isn’t full.
- J. If the moon is not full, my dog won’t bark.
- K. If the moon is full, my dog will see a cat.

CONTINUE ON TO THE NEXT PAGE ►

# READING

## QUESTIONS 21-50

**DIRECTIONS:** Read each passage below and answer the questions following it. Base your answers **only on information contained in the passage**. You may reread a passage if you need to. Mark the **best** answer for each question.

The saber-toothed cat, now extinct but once one of history's most ferocious carnivores, lived between ten thousand and forty thousand years ago. The saber-tooth is named for its most notable feature, a pair of sharp, curved canine teeth—as long as eight inches—used to attack and kill a variety of large, grass-eating animals. Its most frequent prey was the elephant-like mastodon. Skeletons of the two animals have been found together on several continents, and the extinction of the saber-tooth closely followed the demise of mastodons in each of these locations.

Much of what scientists know about the saber-tooth results from their study of bones found in the La Brea tar pits in Los Angeles. For centuries these sticky death traps performed a grisly service for modern scientists, trapping and suffocating thousands of careless, usually healthy animals, both predator and prey, and preserving their bones in asphalt. From La Brea bones, much of the saber-tooth's violent life has been reconstructed. The cat's six-foot long skeleton revealed its killing technique: a swift and powerful forward charge, a 90-degree opening of the jaw, and, finally, the use of its sharp teeth and powerful neck muscles to inflict wounds that could bring down even a mastodon in a few minutes.

Recent studies, however, have somewhat modified scientists' view of the efficient, lone killer and hint that the saber-tooth had a heart—at least for its own kind. The many chipped, broken, mended, arthritic,

dislocated, and infected La Brea bones have led researchers to conclude that the violent attacks of the saber-tooth often put them out of commission for considerable amounts of time. During these mending periods, researchers have reasoned, other cats must have allowed wounded comrades to share in their kills until they could hunt again. The attractive image of a saber-tooth social life, with cats hunting in packs and supporting their own wounded, much like today's lions, is supplemented by another La Brea discovery. A study of saber-tooth throat bones indicates that the cats possessed the ability to purr as well as roar.

21. Which of the following best tells what this passage is about?
- A. how scientists find saber-tooth bones
  - B. the relationship between mastodons and saber-tooths
  - C. how the La Brea tar pits were formed
  - D. how knowledge about saber-tooths is gained from bone studies
  - E. why saber-tooths are studied by scientists
22. Which of the following is **not** mentioned in the passage as a behavior of saber-tooths?
- F. charging prey
  - G. biting prey
  - H. sharing food
  - J. escaping its predators
  - K. purring

23. What does the passage imply about the prey of the saber-toothed cat?
- A. They often killed the cats during their battles.
  - B. They were dependent upon the cats for survival.
  - C. They were usually larger than the cats.
  - D. They lived primarily in what is now California.
  - E. They were never trapped in the tar pits.
24. Which of the following best describes what is suggested by the statement that the saber-tooth “had a heart” (line 35)?
- F. The killing behavior was unusual for the cats.
  - G. The cats felt something like regret at killing their prey.
  - H. The cats never behaved violently toward each other.
  - J. The cats felt emotions such as fear and anger.
  - K. The cats’ food-sharing resembled an act of kindness.
25. What is the most likely reason that saber-toothed cats became extinct?
- A. They were trapped and killed in the tar pits.
  - B. Their main source of food became extinct.
  - C. Many were wounded, but they were not nursed by other saber-tooths.
  - D. They were killed off by their predators.
  - E. They were extremely vulnerable to disease and injury.
26. What is the “grisly service” (line 19) provided by the La Brea tar pits?
- F. They trapped predators that would have killed other animal species.
  - G. They helped predators capture their prey more easily.
  - H. They trapped only saber-toothed cats.
  - J. They preserved the skeletons of animal species that are now extinct.
  - K. They provided a place where wounded saber-tooths could go to die.

CONTINUE ON TO THE NEXT PAGE ►

Tea has a long history of medicinal use in India and China, where it was used to relieve drowsiness and thus aid the meditation of Buddhist monks. A monk studying in China brought the first tea to Japan some time before A.D. 729—the first recorded use of tea in that country. In 1191, tea drinking in Japan was further encouraged by Yaesai, a Zen master who brought new tea seeds from China. Yaesai treated the tea plant as a sacred remedy and an aid to religious experience. His writings contain the outline of what has become known as the “tea ceremony.”

According to some sources, the Japanese nobility practiced a quite different social activity associated with tea drinking—the tea tournament. Reminiscent of modern-day wine-tasting events, tea tournaments involved tasting bowls of tea from different areas and guessing the origin of each. This version of tea drinking was far removed from the earlier connection with religious activity.

The next important development in the tea ceremony occurred during the fifteenth century. The Silver Pavilion was built for a retired Japanese military leader, or shogun, who devoted the rest of his life to perfecting the arts and rituals of the ceremony. By that time the tea ceremony had become an essential part of the cultural life of Japan. Perhaps the ceremony reached its pinnacle in the sixteenth century with the great tea master Rikyu, who established the rules and etiquette for the ceremony as it is still practiced today.

The tea ceremony has been described as a “ritualized sequence of movements, a formal dance of significant gestures.” Two principles prevail: *shibui* (impeccable taste) and *wabi* (simplicity and absence of luxury), and the ceremony follows strict rules. The ceremony takes place in a tea room, either part of a house or a separate building in a garden. Although simple in design and lacking in pretension, tea rooms are built of

the finest materials and with the most expert workmanship. Often they cost more than the house itself!

The full tea ceremony has three parts and may last for four hours. The guests spend a few moments in the garden before being invited into the tea room for a light meal.

After eating, they return to the garden for meditation before returning for “thick tea.” The host prepares one cup of tea, and the cup is passed from one guest to another in a series of bows and other movements. Again the guests retreat to the garden. During the third part, known as “weak tea,” a separate batch of tea is prepared for each guest. The weak tea part of the ceremony is often the only one practiced today, when tea ceremonies may be conducted to honor birthdays or other special days. Even in this shortened form, however, the tea ceremony provides busy people an opportunity for quiet reflection in a gracious setting.

27. Which of the following best tells what this passage is about?
- A. tea ceremonies around the world
  - B. a contrast between the tea ceremony and other Japanese traditions
  - C. the development of the Japanese tea ceremony
  - D. how tea came to Japan
  - E. how Rikyu invented the tea ceremony
28. What does the passage suggest about the use of tea as a medicinal cure?
- F. It was used only by members of the nobility.
  - G. It could cure almost any disease.
  - H. It was used only in Japan.
  - J. It has been used in this way for centuries.
  - K. Its use was considered foolish by Zen masters.

CONTINUE ON TO THE NEXT PAGE ►

29. Which of the following statements is true of the present-day tea ceremony in Japan?
- A. It usually includes only the weak tea portion.
  - B. It never takes place in the host's home.
  - C. It often occurs in an ornate tea pavilion.
  - D. It requires four hours to complete.
  - E. It always includes a light meal.
30. According to the passage, which of the following statements about Rikyu's tea ceremony is accurate?
- F. He developed it around the year 1200.
  - G. It established rules that are still observed.
  - H. It consisted only of thick tea.
  - J. It was used by Buddhist monks.
  - K. It was intended only for shoguns and other aristocracy.
31. Which of the following is an expression of the principle of *wabi*?
- A. a wine-tasting party
  - B. a tea tournament
  - C. the design of a tea room
  - D. the desire to celebrate birthdays
  - E. the desire to drink only the finest tea imported from China
32. From the comments of the author, the most likely reason the tea ceremony has survived to the present day is that
- F. tea is still considered a luxury.
  - G. people again recognize the medicinal value of tea.
  - H. people still use tea as an aid to religious experience.
  - J. people appreciate the opportunity to be quiet and reflective.
  - K. people still enjoy participating in tea tournaments.

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The tenth century A.D. was a period of cultural and artistic revival in the European countries bordering the Mediterranean Sea. The magnificent works of art and architecture of that period used, among other materials, African gold, ivory, and rock crystals. But most of these materials would have been unavailable to European artists without a sophisticated trading network established along the east coast of Africa, from present-day Somalia to northern Mozambique. The African traders represented many groups but were united by their common use of the Swahili language. For that reason, the traders are collectively known as “Swahili.”

For centuries, the Swahili had sailed the African coast in small, seaworthy boats of their own design. They were expert navigators, and their knowledge of the dangerous coastal waters enabled them to expand their influence along 3,000 kilometers of East African coastline. In this region, known as the Swahili corridor, the Swahili traded salt, cloth, and iron products for a wide range of goods from groups living in the African interior.

In the ninth century, the Swahili traded with Persian Gulf merchants, who in turn traded with China. The exchanges involved Chinese pottery—discovered in recent East African coastal excavations—for African goods, particularly ivory. In the tenth century a new trade sprang up as Muslim traders from the Red Sea came seeking African gold, ivory, and crystals to sell to Mediterranean Europe. They found the Swahili trading network already in place. For the goods they sought, the Muslims offered not only money but technical advice in matters that ranged from building techniques to arts and crafts.

The Swahili trading network did more than help the circulation of international products between Europe, Asia, and Africa. Since the Swahili traded with varied African societies, from herders and farmers to

hunters, they became a source of exchange for both goods and information within the region. Their network brought both economic advancement and a degree of cultural unity among the people of East Africa.

33. Which of the following best tells what this passage is about?
- A. the role played by the Swahili in international trade in the ninth and tenth centuries
  - B. the Swahili contribution to a revival of African art and culture
  - C. the effect of the Swahili traders on the art of tenth-century Europe
  - D. the sailing and boatbuilding skills of the Swahili traders
  - E. how the Swahili traders used their wealth to develop their homeland
34. Who were the Swahili’s first trading partners?
- F. the Chinese
  - G. European countries
  - H. other African societies
  - J. Red Sea merchants
  - K. Persian Gulf merchants
35. What was most important in enabling the Swahili to establish their trade along such a large portion of the African coast?
- A. large holdings of gold and ivory
  - B. knowledge of the coastal waters
  - C. ability to trade with European countries
  - D. knowledge of European art
  - E. possession of goods from China
36. What is an example of the goods sought by the traders from the Red Sea?
- F. Chinese pottery
  - G. money
  - H. art objects
  - J. building techniques
  - K. ivory

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- 37.** What was the most likely location for the Swahili to exchange gold for Chinese pottery?
- A.** in the interior of Africa
  - B.** on the coast of East Africa
  - C.** in the Persian Gulf
  - D.** on the shores of the Red Sea
  - E.** somewhere in China
- 38.** In what way were Swahili traders involved in the artistic revival in tenth-century Europe?
- F.** The materials they traded with Muslim traders from the Red Sea were used in the European revival.
  - G.** They sold African gold, ivory, and crystals to the Europeans in exchange for arts and crafts.
  - H.** They traded salt, cloth, and iron products with Persian Gulf merchants in exchange for gold, ivory, and crystals.
  - J.** They offered technical advice as well as money in exchange for European art.
  - K.** Their network introduced artistic practices of the Chinese to Europeans.

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A brilliant comet appears in the sky about once every ten years. In recent times, the appearance—technically called an apparition—of a comet is frequently the occasion for celebration, including T-shirts and posters. One shirt, for Halley’s comet in 1985-86, trumpeted, “coming soon to a sky near you.” For most of the history of the human race, however, the appearance of a comet has inspired fear, dire predictions, and irrational behavior. At first glance, that may seem surprising. Comets are beautiful, slow-moving objects, absolutely quiet, and clearly very far away from the earth. Why, then, did they inspire such terror and forecasts of doom in virtually every culture of the world for thousands of years? It may well be because—until the last few centuries—people could not fit comets into what they knew about the universe, and because fear is a very human reaction to the unknown.

In earlier times, people were in much closer touch with the natural world around them than are most people today. They watched the skies and learned to recognize, if not fully understand, the regularity of the movements of heavenly bodies. They learned to predict these movements and to connect them with specific aspects of their lives, such as the passage of time, the seasons, and the weather. Comets, on the other hand, appeared without warning anywhere in the sky, wandered aimlessly for a few days, then disappeared as suddenly as they had come. With no apparent rhyme or reason for their appearances, comets became objects of awe and fear.

In the twenty-first century, these once-feared objects can be described scientifically. For example, every comet has a head, with a nucleus of icy material that has been described as a “dirty snowball.” This nucleus is surrounded by a fuzzy-looking, gaseous region called the coma. Frequently a comet also has a tail composed of gases and dust. The ancient Chinese called comets broom stars, the Aztecs

referred to them as smoking stars, and the Tshi people of Zaire named them hair stars. The English name for them comes from the Greek kometes, meaning long-haired. The Tonga people of the South Pacific perhaps came closest to the truth when they named them stars of dust.

Nearly every culture has taken the arrival of a comet as a sign of undesirable change or bad luck. To the Masai of East Africa, comets portended famine, and to the Zulus farther south, war. The Chinese catalogued dozens of comet types, each predicting a specific kind of doom. Europeans regarded them with superstition and fear. Only the !Kung people of modern-day Namibia were optimistic when sighting a comet, believing it guaranteed a happy future.

Although we now know a great deal about comets and can predict their apparitions and movements with considerable accuracy, they are still capable of inspiring awe and wonder as they light up the night sky.

39. Which of the following best tells what this passage is about?
- A. the return of Halley’s comet
  - B. what comets look like
  - C. people’s fascination with and fear of comets
  - D. records of comet apparitions
  - E. what astronomers know about comets
40. Why did comets inspire fear in ancient times?
- F. They appeared to be very close to earth.
  - G. They appeared frequently in the night sky.
  - H. They exploded noisily when they disappeared.
  - J. Their appearances were unpredictable.
  - K. They predicted war and disaster.

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41. The !Kung people differed from other African cultures because they
- A. thought comets were made of dust.
  - B. kept careful records of comet apparitions.
  - C. believed comets told of coming war.
  - D. understood the movements of comets.
  - E. took comets to be signals of good luck.
42. Why does the author say that the Tongan name for a comet “came closest to the truth” (line 54)?
- F. The tail of a comet is made of dust.
  - G. The shape of the head and tail of a comet suggests long hair.
  - H. A comet is a type of star.
  - J. A comet is composed of smoke.
  - K. The Tongans believed comets brought good luck.
43. The T-shirt boasting, “coming soon to a sky near you,” implied that
- A. Halley’s comet was not bright enough to be seen.
  - B. the appearance of Halley’s comet cannot be predicted accurately.
  - C. the arrival of a comet still inspires great interest.
  - D. comets are no longer of interest to the public.
  - E. something terrible would happen in 1985 or 1986.
44. Which of the following statements about the relationship between comets and disasters is best supported by the passage?
- F. They may occur at the same time, but that doesn’t mean that one causes the other.
  - G. The relationship that existed in ancient times no longer exists.
  - H. Increased scientific knowledge about comets can be used to predict disasters more accurately.
  - J. If people were in closer touch with the natural world, the relationship would be clearer.
  - K. Most ancient cultures did not believe there was a relationship between comets and disasters.

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For centuries, traveling performers played an important role in the culture of India. In ancient times, villagers living in remote areas depended on these traditional folk artists to bring news from far-away places and to entertain them with songs, stories, and acrobatics. Even though the local leaders in the sixteenth century emphasized court-based entertainment and, later, industrialization broke down the old village society, the traditional arts managed to survive. But since India became independent in 1947, people in the rural areas began relying on radio, television, and the movies for information and entertainment.

Support for the wandering entertainers was no longer strong enough to sustain them, and like many displaced workers before them, these folk artists fled to the city in search of new audiences.

In the neighborhoods of the largest cities in India, new threats faced the storytellers, puppeteers, and sword-swallowers. Because they performed in the streets, they were considered beggars—illegal under the new laws of independent India. As recent arrivals with little money, they became squatters in the slums of the cities, victims of slum-clearing projects that frequently flattened their huts. But two recent changes may have created a turning point in the fortunes of the performers. The government has finally recognized their right to form a cooperative and be treated like other businesspeople. And the outside world, exposed to recent movies and TV shows about India, has become fascinated with all things Indian and discovered (or rediscovered) the ancient traditions of the folk artists.

The transition from rural wandering to urban street performing has encouraged other changes as well. In earlier days, the various arts were performed by members of different castes, who would not associate with each other. The cooperative has required that those divisions be broken

down. Now some young people even change from one skill to another. Women have won the right to perform in roles once reserved for men. Some children of these performers have chosen not to follow the old traditions and have become bus drivers and industrial workers, but others are preserving the old ways. Many street artists return annually to their rural ancestral villages, but when they go back to the city, they are coming home.

45. Which of the following best tells what this passage is about?
- A. Traditional traveling performers in India have had to adapt to changing times.
  - B. Folk artists traditionally provided a means of communication in India.
  - C. Folk artists inherited their skills from their ancestors.
  - D. It is extremely important for a country to preserve its artistic heritage.
  - E. Steps must be taken to preserve the Indian tradition of street performance.
46. Which of the threats to traveling performers came first?
- F. the invention of television
  - G. laws against begging
  - H. industrialization
  - J. slum clearances
  - K. entertainment based in the courts of rulers
47. Which of these statements would the author most likely agree with?
- A. Traditional street performing will soon die out.
  - B. Puppetry, acrobatics, and storytelling are now primarily urban professions.
  - C. The cooperative has eliminated the occupations of artists and musicians.
  - D. Laws against begging should be repealed.
  - E. Soon people will see traditional Indian arts only on television.

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48. The passage suggests that the Indian government currently treats street performers as
- F. national treasures.
  - G. beggars.
  - H. businesspeople.
  - J. displaced persons.
  - K. slumlords.
49. Which of the following is **not** suggested as a strength of the current folk artists?
- A. their willingness to change as society changes
  - B. their ability to preserve traditional values
  - C. the fact that they are breaking down caste barriers
  - D. their ability to experiment with new methods
  - E. their willingness to travel constantly around the country once again
50. What effect has the rediscovery of ancient traditions by the outside world had on Indian folk artists?
- F. They have regained some of their former popularity.
  - G. They have lost their legal status as performers.
  - H. They have returned to their homes in the rural villages.
  - J. They have rejected changes in favor of the old traditions.
  - K. They have restricted the participation of women and children.

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# PART 2 — MATHEMATICS

Suggested Time — 75 Minutes

50 QUESTIONS

## GENERAL INSTRUCTIONS

Solve each problem. Select the **best** answer from the choices given. Mark the letter of your answer on the answer sheet. You can do your figuring in the test booklet or on paper provided by the proctor. **DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.**

### 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 problem 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 all fractions to lowest terms.

51. What is the greatest common factor of 105 and 126?

A. 3  
B. 7  
C. 9  
D. 21  
E. 35

52. Simonne, Marco, and Evon were partners in business. Simonne and Marco each received twice as much of the profit as Evon received. If the total profit was \$1,800, how much did Evon receive?

F. \$360  
G. \$600  
H. \$720  
J. \$900  
K. \$1,800

- 53.



In the figure above, points N and P are on line segment  $\overline{MQ}$ .

$$\begin{aligned} NQ &= 30 \text{ cm} \\ MN:NQ &= 3:2 \\ NP:PQ &= 2:1 \end{aligned}$$

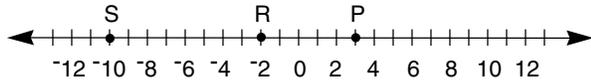
What is the length of  $\overline{MP}$ ?

A. 5 cm  
B. 20 cm  
C. 50 cm  
D. 60 cm  
E. 65 cm

54. Express  $48.762 \times 100$  in scientific notation.

F.  $0.48762 \times 10^3$   
G.  $0.48762 \times 10^4$   
H.  $4.8762 \times 10^2$   
J.  $4.8762 \times 10^3$   
K.  $48.762 \times 10^2$

55.



On the number line above,  $Q$  (not shown) is the midpoint of  $\overline{SR}$ . What is the length of  $\overline{PQ}$ ?

- A. 2.5 units
- B. 6.5 units
- C. 7 units
- D. 9 units
- E. 13 units

56. An 11-sided polygon has 3 sides each of length  $x$  centimeters and 6 sides each of length  $2x$  centimeters. The lengths of the other 2 sides are 12 centimeters and 13 centimeters. If the perimeter of the polygon is 100 centimeters, what is the value of  $x$ ?

- F. 3
- G. 5
- H. 12
- J. 25
- K. 75

57. What is the value of  $3|x| - 5|y|$  if  $x = -7$  and  $y = -11$ ?

- A. -76
- B. -34
- C. -4
- D. 34
- E. 76

58.  $(\sqrt{36})(\sqrt{16}) =$

- F. 4
- G. 6
- H. 24
- J. 48
- K. 144

59. Miller's Factory has decided to run nonstop for three 14-hour shifts. The whistle to start the first shift is to blow at 9:00 a.m. At what time should the whistle blow to **end** the third shift?

- A. 3:00 a.m.
- B. 3:00 p.m.
- C. 1:00 a.m.
- D. 1:00 p.m.
- E. 12:00 midnight

60.  $N$  is an element of the set  $\{0.2, 0.7, 1.4, 2.0, 7.0\}$ , and  $\frac{4.2N}{1.2}$  is an integer. What is  $N$ ?

- F. 0.2
- G. 0.7
- H. 1.4
- J. 2.0
- K. 7.0

61.  $\{1, 2, 3, \dots, 175, 176, 177, 178\}$

How many numbers in the set above have 5 as a factor but do not have 10 as a factor?

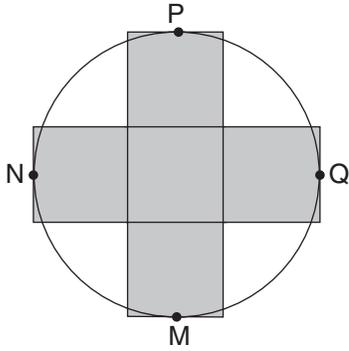
- A. 1
- B. 3
- C. 4
- D. 17
- E. 18

62.  $n$  is an even integer and  $10 < n < 19$ . What is the mean of all possible values of  $n$ ?

- F. 14
- G. 14.5
- H. 15
- J. 15.5
- K. 30

CONTINUE ON TO THE NEXT PAGE ►

63.



The shaded figure in the diagram above consists of five squares. It touches the circle at points M, N, P, and Q. The radius of the circle is 15 centimeters. What is the area of the shaded portion of the figure?

- A. 25 sq cm
- B. 100 sq cm
- C. 125 sq cm
- D. 500 sq cm
- E. 900 sq cm

64. Sam has 40 grams of nitrate to conduct an experiment. This experiment requires that  $\frac{2}{5}$  gram of nitrate be added to a soil bed each day. At this rate, what is the maximum number of days that Sam can conduct the experiment?

- F. 18 days
- G. 40 days
- H. 100 days
- J. 200 days
- K. 400 days

65. This week Elliott worked 3 days as a clerk in his mother's store. He was paid \$3.78 per hour. If he worked  $6\frac{1}{2}$  hours each day, how much should Elliott be paid?

- A. \$11.34
- B. \$13.23
- C. \$13.28
- D. \$35.91
- E. \$73.71

66. Assume that the notation  $\ddagger(w, x, y, z)$  means "Add  $w$  and  $x$ , multiply this result by  $y$ , and then subtract  $z$ ." What is the value of  $\ddagger(3, 5, 6, 3) - \ddagger(4, 6, 3, 5)$ ?

- F. 5
- G. 15
- H. 20
- J. 45
- K. 70

67. Twelve out of 25 students picked "The Flying Fuzz Brothers" as their favorite video game. What percentage of the class did **not** pick "The Flying Fuzz Brothers"?

- A.  $\frac{13}{25}\%$
- B. 13%
- C. 48%
- D. 51%
- E. 52%

68. The product of 3 different positive integers is 10. What is their sum?

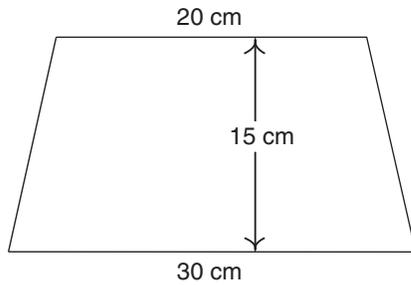
- F. 7
- G. 8
- H. 10
- J. 13
- K. 30

69. A circle has an area of  $p$  square feet and a circumference of  $q$  feet. If  $p = 2.5q$ , what is the radius of the circle?

- A. 1.25 ft
- B.  $\sqrt{2.5}$  ft
- C. 2.5 ft
- D. 5 ft
- E. 10 ft

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70.



What is the area of the trapezoid above?

- F. 50 sq cm
- G. 65 sq cm
- H. 80 sq cm
- J. 375 sq cm
- K. 750 sq cm

71. For what positive value of  $x$  does

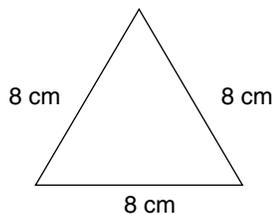
$$\frac{4}{5} = \frac{x^2}{20} ?$$

- A. 4
- B. 5
- C. 8
- D. 16
- E. 256

72. Four consecutive multiples of 10 have a sum of 300. What is the **least** of these numbers?

- F. 20
- G. 30
- H. 40
- J. 50
- K. 60

73.



What is the area of a square that has the same perimeter as the triangle above?

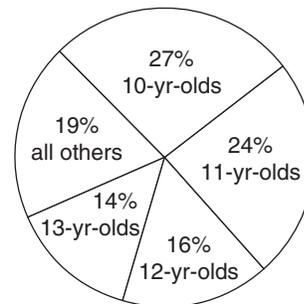
- A. 16 sq cm
- B. 24 sq cm
- C. 32 sq cm
- D. 36 sq cm
- E. 64 sq cm

74. Jorge is 5 less than the number that is 3 times his brother's age. If his brother is 8 years old, how old is Jorge?

- F. 9 yr
- G. 16 yr
- H. 19 yr
- J. 25 yr
- K. 29 yr

75.

PEOPLE WHO EAT COTTON CANDY



If 10,000 pounds of cotton candy are consumed each year, how many pounds are consumed by 12-year-olds?

- A. 16 lb
- B. 160 lb
- C. 625 lb
- D. 1,600 lb
- E. 120,000 lb

76.

SCHOOL EXHIBIT VISITORS

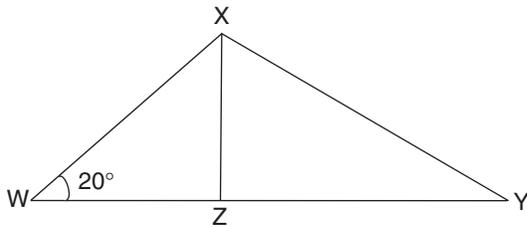
Day	1	2	3	4	5	6	7	8	9
Number of Visitors	16	21	20	17	19	21	17	21	18

According to the table above, what is the median number of visitors in the nine days?

- F.  $18\frac{1}{2}$
- G.  $18\frac{2}{9}$
- H. 19
- J. 20
- K. 21

77. If  $x = 14$  and  $y = 11$ , what is the value of  $5x(x - y)$ ?
- A. 3  
 B. 15  
 C. 67  
 D. 73  
 E. 210

78.



In the diagram above,  $Z$  is a point on side  $WY$  of triangle  $WXY$ . Triangles  $WXZ$  and  $XYZ$  are similar. What is the measure of  $\angle WXY$ ?

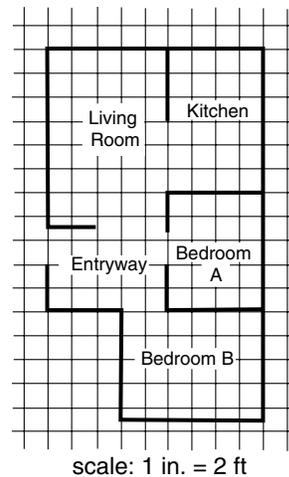
- F.  $20^\circ$   
 G.  $70^\circ$   
 H.  $90^\circ$   
 J.  $110^\circ$   
 K.  $140^\circ$
79. For what value of  $p$  is  $3(p - 4) = 2(p + 1)$ ?
- A. 1  
 B. 2  
 C. 4  
 D. 5  
 E. 14

80. The probability of drawing a green candy from a jar of 20 candies is  $\frac{1}{4}$ . How many yellow candies should be added to the jar in order to reduce the probability to  $\frac{1}{6}$ ?
- F. 3  
 G. 4  
 H. 6  
 J. 8  
 K. 10

81. John works 5 days a week. On Monday he completes  $\frac{1}{2}$  of his week's work. On Tuesday he completes  $\frac{1}{4}$  of the remainder of his work for the week. What fraction of the week's work remains to be done?

- A.  $\frac{1}{8}$   
 B.  $\frac{1}{4}$   
 C.  $\frac{1}{3}$   
 D.  $\frac{3}{8}$   
 E.  $\frac{3}{4}$

82.



The floor plan above is drawn on a grid made up of 1-inch squares. About how many square **yards** of carpet are needed to cover bedroom B?

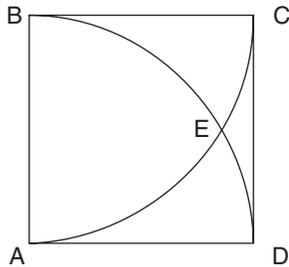
- F. 12 sq yd  
 G. 27 sq yd  
 H. 54 sq yd  
 J. 81 sq yd  
 K. 108 sq yd

CONTINUE ON TO THE NEXT PAGE ►

83. Nicki has  $n$  stamps. She has half as many stamps as Mark has. Together, Nicki and Mark have 100 more stamps than Basilio. In terms of  $n$ , how many stamps does Basilio have?

- A.  $3n - 100$
- B.  $3n + 100$
- C.  $\frac{1}{2}n + 100$
- D.  $n - 100$
- E.  $\frac{3}{2}n - 100$

84.



In the diagram above, ABCD is a square. BED is an arc of a circle centered at A, and AEC is an arc of a circle centered at B. The circles intersect at E. Find the measure of  $\angle EBA$  (not shown).

- F.  $30^\circ$
- G.  $45^\circ$
- H.  $50^\circ$
- J.  $60^\circ$
- K.  $90^\circ$

85. Paula is now 4 times the age of Jae-Lynn. If Jae-Lynn will be 16 in 10 years, how old was Paula 4 years ago?

- A. 6
- B. 10
- C. 16
- D. 20
- E. 24

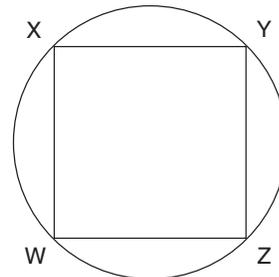
86. In an election between two candidates, the winner received 55% of the 17,000 votes. The loser received the remaining votes. How many more votes did the winner receive than the loser?

- F. 500
- G. 1,700
- H. 3,000
- J. 7,650
- K. 9,350

87. Javial is packing boxes of candles for shipment. Each box can hold 15 candles. If Javial has 142 candles and fills all but the last box to capacity, how many candles will go into the last box?

- A. 7
- B. 8
- C. 10
- D. 14
- E. 22

88.



In the figure above, W, X, Y, Z are points on a circle and WXYZ is a square. If the diagonal of the square is 16 centimeters long, what is the circumference of the circle?

- F.  $8\pi$  cm
- G.  $16\pi$  cm
- H.  $32\pi$  cm
- J.  $64\pi^2$  cm
- K.  $1,600\pi$  cm

CONTINUE ON TO THE NEXT PAGE ►

89. There are 660 feet in one furlong, and  $\frac{1}{2}$  of a fathom in one yard. How many fathoms are there in one furlong?

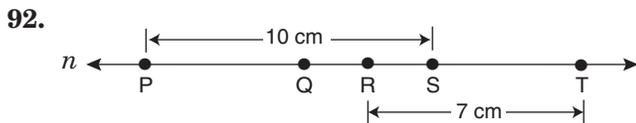
- A. 55
- B. 110
- C. 220
- D. 330
- E. 440

90. If  $x = 3$  and  $6x(2y - 3x) = 18$ , what is the value of  $y$ ?

- F. 2
- G. 4
- H. 5
- J. 6
- K. 9

91.  $\frac{n}{20} = \frac{k}{x}$   
If  $n = 4$  and  $k = 13$ , what is the value of  $x$ ?

- A. 12
- B. 40
- C. 52
- D. 65
- E. 80



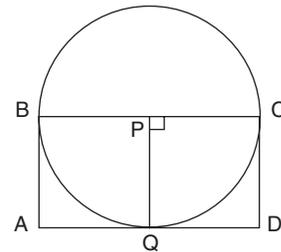
On line  $n$ , if  $QS = 6$  centimeters and  $QR = RS$ , what is the length of  $\overline{PT}$ ?

- F. 12 cm
- G. 13 cm
- H. 14 cm
- J. 16 cm
- K. 17 cm

93. There are  $x$  seats in the Ralston Theater and  $y$  seats in the Baker Theater. The Baker Theater has 3 more than twice as many seats as the Ralston Theater. What is the value of  $y$  in terms of  $x$ ?

- A.  $x + 3$
- B.  $2x + 3$
- C.  $2x - 3$
- D.  $3x$
- E.  $3x + 3$

94.



$P$  is the center of the circle.  $\overline{BC}$  is a diameter. The perimeter of rectangle  $ABCD$  is 48 centimeters.  $\overline{PQ}$  is a radius and  $Q$  is on  $\overline{AD}$ . What is the area of the circle?

- F.  $8\pi$  sq cm
- G.  $16\pi$  sq cm
- H.  $32\pi$  sq cm
- J.  $64\pi$  sq cm
- K.  $128\pi$  sq cm

95.  $\left(\frac{1}{2} + \frac{2}{5}\right) \div \frac{2}{3} =$

- A.  $\frac{2}{5}$
- B.  $\frac{1}{2}$
- C.  $\frac{3}{5}$
- D.  $\frac{21}{20}$
- E.  $\frac{27}{20}$

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**96.** A basketball team scored 60 points in the first game and 50 in the second game. How many points did the team score in the third game if their mean score for the 3 games was 51 points?

- F.** 43
- G.** 45
- H.** 47
- J.** 49
- K.** 55

---

**97.** One side of a square is 10 units long and lies on the  $y$ -axis of a coordinate system. Another side of the square lies on the  $x$ -axis of the coordinate system. What must be the coordinates of one corner of this square?

- A.** (0, 0)
- B.** (0, 10)
- C.** (10, 0)
- D.** (10, 10)
- E.** (-10, -10)

---

**98.** Of 27 marbles in a can, 7 were black, 4 were yellow, and the rest were red. Jay removed 3 black marbles, then one more marble at random. What is the probability that it was red?

- F.**  $\frac{1}{3}$
- G.**  $\frac{5}{9}$
- H.**  $\frac{16}{27}$
- J.**  $\frac{5}{8}$
- K.**  $\frac{2}{3}$

---

**99.** Zoe ate  $\frac{1}{8}$  of a pizza. Jasmine ate twice as much of the same pizza as Zoe. What is the ratio of the amount of pizza the two ate to the amount of pizza remaining?

- A.** 1:2
- B.** 1:4
- C.** 3:5
- D.** 3:8
- E.** 5:8

---

**100.** If  $x$  is an even integer, which of the following **cannot** be an odd integer?

**F.**  $x + 1$

**G.**  $\frac{x}{2}$

**H.**  $\frac{x}{3}$

**J.**  $2x + 1$

**K.**  $2x - 1$

THIS IS THE END OF THE TEST. IF TIME REMAINS, YOU MAY CHECK YOUR ANSWERS TO PART 2 AND PART 1. BE SURE THAT THERE ARE NO STRAY MARKS, PARTIALLY FILLED ANSWER CIRCLES, OR INCOMPLETE ERASURES ON YOUR ANSWER SHEET. ■

## Scrambled Paragraphs

### Paragraph 1 (TRSUQ)

Sentence T follows the given sentence because it refers to the creation of magnetic compasses in China. The rest of the paragraph describes how the compasses were made, beginning with R, magnetizing a needle and balancing it on the rim of a cup. All subsequent sentences refer to a magnetized needle. S links to R with the statement, “this balancing act was hard to maintain.” U describes another, “more effective” method, in which the needle was attached to a strand of silk. Q continues the description of this alternate method.

### Paragraph 2 (QTRSU)

The given sentence talks about European world explorers. Q is next because it mentions the famous European explorer Marco Polo. T follows Q with its statement that some lesser known explorers actually traveled more than Marco Polo. R is next because it names one of these lesser known travelers, Ibn Batuta. S continues Batuta’s story by telling us that he traveled all over Africa and Asia. U is last, summarizing Batuta’s career—24 years of traveling, covering more than 75,000 miles.

### Paragraph 3 (QSURT)

The given sentence says that processionary caterpillars rely on instinct in their daily routines. Q describes how the caterpillars nest with other caterpillars, then leave together at night. S must follow Q because S describes how the caterpillars leave the nest. S begins, “As they leave the nest . . .,” and describes how one caterpillar becomes the leader, spinning out a silk line behind itself. U describes how the other caterpillars line up behind the leader and reinforce the leader’s silk line with their own silk lines as they pass over. R describes how the caterpillars return to their nests. T must be last because it would not make sense to come before the description of the silk lines given in previous sentences.

### Paragraph 4 (UTRQS)

The given sentence introduces Suzman by her full name and gives the dates of her career. U is next with its reference to “those forty years” and her stand against apartheid. Next is T because it refers to Suzman’s personal efforts, for which she was nominated for the Nobel Peace Prize. R follows T, mentioning her other

human-rights awards and honorary degrees. Q refers to these awards and degrees as international recognition of Suzman’s work. S ends the paragraph by summarizing the success of antiapartheid forces, and concludes with Suzman’s retirement.

### Paragraph 5 (QUSTR)

The given sentence says that Jules Verne was not the first writer to write about space travel, which sets the stage for a discussion of other writers. Q is next because it links to Verne and starts the backward chronological sequence from Verne to Kepler and Godwin in the sixteenth century (U), to a Persian poet in A.D. 1010 (S), to a second-century Greek (T). R concludes the paragraph with its statement that fantasies of space travel have existed for thousands of years. Note that the order of the middle three sentences cannot be TSU, a forward chronology. S cannot follow T because of its time reference, “even earlier”; A.D. 1010 in S is not earlier than the second-century story in T.

## Logical Reasoning

11. (A) Use a diagram to help solve this question. Write “top” and “bottom” on your scrap paper and the numbers 1 through 5, beginning at the bottom with 1. Then look for specific locations of each shape. Statement two says that the circle is the fourth shape; write “circle” next to 4. Statement four tells you that exactly two shapes are lower than the oval, which means the oval is position 3. Since there are exactly three shapes between the rectangle and the square, these two must be in the first and fifth positions; and, since statement four says the rectangle is lower than the oval, you can write “rectangle” next to 1 and “square” next to 5. That leaves the triangle in position 2:

*Top*

*5 = square*

*4 = circle*

*3 = oval*

*2 = triangle*

*1 = rectangle*

*Bottom*

12. (F) According to the definition given, a species is extinct when no more members are living. Therefore, Option G is impossible. Option H is incorrect because there is no statement to suggest that the species will soon be extinct. Option J may be true, but it cannot be deduced from the given statements. The question says nothing about other living species that are thought to be extinct. Option K is false; nothing can be living and extinct at the same time. Option F is correct; if a living fish were caught, it was never extinct.

13. (D) Use a diagram to help answer this question. Write “top” and “bottom” on your scrap paper. Then record what the question says about each board. The question says that the top board is walnut, and statement three says that the ash board is third from the top. Statement two tells you that exactly two boards are between the walnut and oak boards, which means the oak board is in position 4.

*Top*

*1 = walnut*  
*2 = ?*  
*3 = ash*  
*4 = oak*  
*5 = ?*

*Bottom*

That leaves the pine and maple boards for the remaining open positions, which are positions 2 and 5. According to statement one, the maple board is lower than the walnut board. This condition will be fulfilled whether the maple board is in position 2 or 5, so we cannot determine which position it is in. There is no information at all that can be used to determine the location of the pine board. Thus, the correct answer is Option D: “Either pine or maple, but it is not possible to determine which one.”

14. (J) We must check each option against the facts presented to determine which option is valid. We know nothing about Sydney except the size of her donation to North College. Thus, Option F, although it **might** be true, cannot be validly concluded. Options G and H also **might** be true, but we don’t know that from the information given. The same is true for Option K. Option J is a valid conclusion, since we are told that graduates are expected to donate more than Sydney donates, and Sydney might or might not be a graduate.

15. (A) This question asks you to match each driver with his or her car and place the cars in order of crossing the finish line. First, look for statements that provide information about the driver of each car. Statement four says that Pierre was in the red car, statement five says that Stephanie drove the yellow car, and statement three says that Charles was not in the blue car. Thus the driver of

the blue car must be Jennifer, leaving Charles with the green car. Now put the four cars and drivers in order. Based on statement one, draw a diagram showing the order in which the cars crossed the finish line.

*First*

*Pierre (red car)*  
*Jennifer (blue car)*

*Last*

Based on statements two and five, Charles (green car) and Stephanie (yellow car) finished behind Jennifer. Either of the following orders could be correct, based on the information provided.

<i>First</i>	<i>OR</i>	<i>First</i>
<i>Pierre</i>		<i>Pierre</i>
<i>Jennifer</i>		<i>Jennifer</i>
<i>Charles</i>		<i>Stephanie</i>
<i>Stephanie</i>		<i>Charles</i>
<i>Last</i>		<i>Last</i>

In either order, the blue car, driven by Jennifer, finished before the green car, driven by Charles.

16. (K) Let an initial stand for each kind of plant. From the information given, you can deduce that the six houseplants are comprised of two ivy plants (I), one African violet (A), two ferns (F), and one pothos (P). The words “next to” in statements three and four indicate that the houseplants are side by side, with no plants between them.

The question does not provide definite information about the houseplant locations, but you can figure out their locations relative to each other. Statement two describes the following sequence of three adjacent plants: FPF.

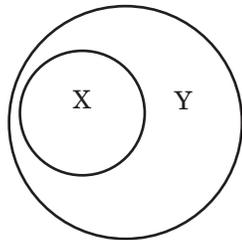
Statement four places the African violet next to one of the ferns (it does not matter which one): AFPF (or FPFA).

According to statement three, an ivy plant is next to the African violet: IAFPF (or FPFAI).

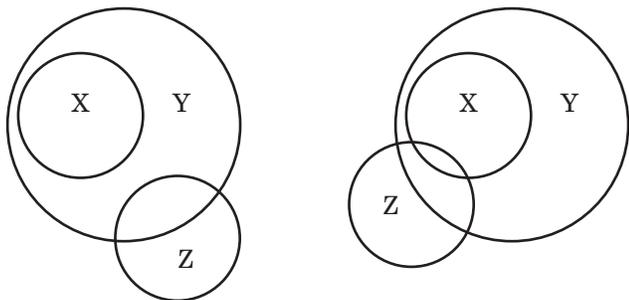
The sixth plant is another ivy plant. It could be placed at either end of the row: IIAFPF or IAFPPFI (IFPFAI or FPFIAI).

In one solution above, the houseplants at the ends of the row are an ivy plant and a fern. In another, equally valid, solution, they are the two ivies. Is it impossible to determine which houseplants are at the ends of the row, which is Option K.

17. (A) To answer this question correctly, it is important to understand the relationships among the memberships of the three clubs. According to the question, every member of club X is also a member of club Y. It is helpful to draw a diagram to illustrate this relationship:



The question says that some members of club Z are also members of club Y. There are two possibilities for representing this relationship. With the information given, we cannot determine which possibility is correct.



The question says that Sonya is in exactly two of these clubs, but does not specify which ones. She could be in clubs X and Y, or clubs Y and Z. She cannot be in clubs X and Z because membership in club X implies membership in club Y, which adds up to membership in three clubs, not two.

Read each option and evaluate whether it **must** be true, based on the information given. Option A must be true; if Sonya is in club X, then her second club is Y, not Z. The other options may or may not be true, but we cannot conclude that any of them **must** be true. Option C looks appealing, but it has changed the information given in the question. “Every member of club X is also a member of club Y” does not mean “Every member of club Y is also a member of club X.”

**18. and 19.** These directions differ from the directions for the code in Sample Form B. They state that the position of a letter is **never** the same as that of the word it represents. For example, in the first sentence, M cannot represent “this.” To answer these questions, you need not find out what every letter represents.

18. (K) The word “states” appears in the first two sentences, but not the third. W can be ruled out because it is in the same position as “states.” X cannot be correct; it does not appear in the first sentence. N and Q are ruled out because they appear in the third sentence, which does not include “states.” That leaves M, which is the correct answer.

19. (C) W appears in all three sentences, as do Q and N and the words “this,” “train,” and “crosses.” W cannot represent “this” because both appear in the first position in the third sentence. N and Q cannot represent “crosses” since they are in the same position as “crosses” in the second and third sentences, respectively. Therefore, W must represent “crosses.”

20. (H) The problem says that two circumstances, a full moon and the sight of a cat, will cause my dog to bark. We **do not** know that these are the only two circumstances because the information given does not say so. Therefore, you can rule out options F and G. J is wrong because the information given says nothing about what the dog would do when the moon is not full. K is wrong because it incorrectly combines two pieces of information. H is correct. If my dog does not bark, then the moon cannot be full; otherwise it will bark. It also has not seen a cat; again, it will bark otherwise.

## Reading

### (Saber-Tooth)

21. (D) This question asks you to determine the general theme of the passage. Option A is a small detail and does not apply to the entire passage. Option B, though important, also is a detail. Options C and E are not discussed. The passage describes what we know about saber-toothed cats based on the study of bones preserved in the tar pits. Thus, the best answer is Option D.

22. (J) You can approach this question by eliminating the options mentioned in the passage. Charging prey is mentioned in lines 26-27, so Option F can be ruled out. Option G is eliminated by lines 5-8 and 29-31, which describe the saber-tooth’s use of its lethal canine teeth. Option H is incorrect since sharing the kill with wounded comrades is described in lines 42-44. Option K is eliminated by line 51, in which purring ability is mentioned. Option J remains, and since the passage does **not** mention this topic, it is the correct answer.

23. (C) The word “imply” means you must look for information to support an inference not directly stated. The passage says nothing about saber-tooths being attacked by their prey, so Option A is incorrect. Nor can Option B be inferred from information given; in fact, the opposite is more likely. Option D is contradicted by line 11, which mentions the animals’ presence on several continents. Option E is contrary to fact since the passage mentions that mastodon bones were found with saber-tooth bones in the tar pits. The “elephant-like” mastodon is described in lines 8-9 as the saber-tooth’s most frequent prey, and the phrase in line 31, “even a mastodon” suggests that it was larger than a saber-tooth. Therefore Option C is the correct inference.

24. (K) The phrase “have a heart” suggests soft, kind feelings. Option F is wrong, since the saber-tooth was a fierce hunter. Options G, H, and J were not discussed in the passage. Options G and J would be difficult to support because it is impossible to know what emotions the cats felt. Option K is the best answer; it suggests that the act of sharing resembles an act of kindness (lines 41-44).

25. (B) Since the saber-tooth roamed several continents (line 11), Option A is not a likely reason for their extinction. Option C is not true, according to lines 46-47. Option D has no support in the passage, which never mentions that saber-tooths were themselves prey for other predators. Option E might seem likely from lines 36-37, but we have no information to judge the vulnerability of the cats compared with other animals. Option B is best; lines 12-14 suggest that when the mastodon became extinct, the extinction of the cat followed.

26. (J) To define the “grisly service” provided by the tar pits, look at the context of the phrase. The complete sentence says that the tar pits provided a service for modern scientists. The previous sentence (lines 15-18) says that much of scientific knowledge about the saber-tooth has resulted from the study of bones found in the tar pits. The best answer is Option J. The tar pits have preserved animal skeletons that scientists study to learn more about saber-tooths and other extinct species. The other options are incorrect because they do not state how the tar pits helped scientists. Option H contradicts the passage, which says that the pits trapped both predator and prey (lines 20-22). Option K is ruled out because the passage says that the pits trapped the animals (line 20), not that the animals willingly went there to die.

## (Tea Ceremony)

27. (C) The passage does not describe tea ceremonies in other countries, so Option A cannot be correct. Nor does it contrast the tea ceremony with other Japanese traditions, ruling out Option B. Option D is an important

detail, but it does not describe the broad theme of the passage. Option E can be ruled out because Rikyu is mentioned only once, and he did not “invent” the tea ceremony. Option C is the best answer; the passage describes the history of the Japanese tea ceremony, from the first tea brought to Japan until the present time.

28. (J) The first sentence says that tea had a long history of medicinal use in India and China before it was brought to Japan. The Zen master Yaesai treated the tea plant as a sacred remedy (lines 10-12). Option J is the only answer choice that summarizes this information correctly. Options F, H, and K are contradicted by the passage, and Option G—the capability of curing almost any disease—is never claimed by the passage writer.

29. (A) The question asks specifically about the present-day tea ceremony, implying the shortened ceremony, which is discussed in the last paragraph. Option A is supported by the passage, which states, “The ‘weak tea’ part of the ceremony is often the only one practiced today ....” The passage does not specify where tea ceremonies are held in the present day, but the full tea ceremony was traditionally held in the host’s tea room, and it seems likely that the present-day ceremony takes place in the host’s home, thereby ruling out Option B. Options C, D, and E refer to practices that occur in the full tea ceremony, not in the weak tea portion.

30. (G) Rikyu established the rules and etiquette for the tea ceremony as it is practiced today (lines 33-37). Option G restates what the passage says and is the correct answer. Option F is incorrect; Rikyu lived in the sixteenth century. Option H is also incorrect; thick tea is only one of three parts of the full tea ceremony. Options J and K can be ruled out because the passage says that, by the fifteenth century, the tea ceremony had become an essential part of the cultural life of Japan, not limited to Buddhist monks or members of the aristocracy.

31. (C) *Wabi* is defined in lines 42-43: simplicity and absence of luxury, one of the principles that define the tea ceremony. (Be careful not to confuse *wabi* with *shibui*, another important principle with a very different meaning.) Options A and B can be ruled out because little information is provided about wine-tasting parties and tea tournaments, except that they were social events for tasting beverages. We cannot determine whether or not these activities exhibited the quality of *wabi*. Option C refers to the simple design of the tea room, lacking in pretension (lines 46-47). This quality matches the definition of *wabi*, and Option C is the correct answer. Option D does not have any relationship with *wabi*. Option E does not demonstrate *wabi* (though it may demonstrate *shibui*, impeccable taste).

32. (J) You are asked to infer the most likely reason that the tea ceremony has survived to the present day. Option F can be ruled out; tea is no longer considered a luxury, and the tea ceremony has been part of the cultural life of Japan since the fifteenth century (lines 25-32). Options G, H, and K are incorrect because they characterize tea drinking in earlier centuries, not the tea ceremony as it is practiced today. Option J is the best answer. The author commented that part of the ceremony is still conducted to celebrate special days, and it “provides busy people an opportunity for quiet reflection in a gracious setting” (lines 68-69).

### (Swahili Trade)

33. (A) Option B may seem correct; however, the term “revival” in the passage refers to European, not African, culture and art. Options C and D are details. Option E is not mentioned. Option A is the best answer because it gives an excellent summary that is neither too broad nor too detailed.

34. (H) The earliest known trading partners mentioned are groups from the African interior (lines 26-27). The other options list later trading partners.

35. (B) Options A, C, D, and E are aspects of the trade network, but none is related to the Swahili’s success in establishing trade along the dangerous coast of Africa. Lines 20-23 directly relate the Swahili’s knowledge of the coastal waters to their expanded influence. Option B is the best answer.

36. (K) The answer is found in lines 34-37, which state that the Red Sea traders sought African gold, ivory, and crystals. Thus the correct answer is Option K. Options G and J are products offered, not sought, by the Red Sea traders. Option F refers to a product traded by another group, the Persian Gulf merchants, and Option H is not mentioned as a medium of exchange for any group.

37. (B) The Swahilis were described as coastal traders (lines 17-19), so we can eliminate Option A. Options C and E are incorrect because the passage did not mention that they sailed outside the East African coast. We can eliminate Option D because traders from the Red Sea came to exchange goods (line 35). Thus the coast of East Africa is the only possible place where the trade took place.

38. (F) The first paragraph says that European artists obtained some of their materials through the Swahili trading network. Lines 34-37 state that Muslim traders from the Red Sea bought African gold, ivory, and crystals from Swahili traders to sell to Mediterranean Europe (Option F). Options G, J, and K are incorrect because

the Swahili traders did not deal directly with the Europeans, nor did they purchase European art. Option H is contradicted by lines 28-33.

### (Comets)

39. (C) Option C best summarizes the main idea, encompassing all five paragraphs of the passage. The other options are important details that do not describe the overall theme.

40. (J) This question is similar to the question raised in lines 15-17: “Why, then, did they [comets] inspire such terror and forecasts of doom in virtually every culture of the world for thousands of years?” The passage continued, “It may well be because . . . people could not fit comets into what they knew about the universe, and because fear is a very human reaction to the unknown.” Later, the passage stated, “With no apparent rhyme or reason for their appearances, comets became objects of awe and fear” (lines 36-38). In other words, comets inspired fear because they were unpredictable, which is Option J. Options F and H are contradicted by lines 13-14. Option G is not mentioned in the passage, and Option K is ruled out by the same reasoning that supports Option J.

41. (E) The answer is found in the fourth paragraph, which gives examples of how various cultures once regarded comets. Most people considered comets premonitions of doom, but the !Kung people believed that comets brought good luck (lines 63-66), which is Option E. Options A and C describe other cultures, not the !Kung people. Options B and D are not supported by the passage.

42. (F) The correct answer requires you to combine information from several places in the passage. The Tongan name for comets is “stars of dust” (line 55). Their name comes closest to the truth because the scientific description of a comet includes a tail composed of gases and dust (lines 46-47). Option G refers to the English name, not the Tongan name. Comets are not actually stars, ruling out Option H. Option J is contradicted by the scientific description, and Option K is incorrect because it was the !Kung people, not the Tongans, who believed that comets brought good luck.

43. (C) The question asks for an inference based on information in the passage but not directly stated. The T-shirt’s inscription, mentioned in lines 6-8, supports the statement in lines 4-5, “a comet is frequently the occasion for celebration.” Note the use of the word “however” in the sentence that follows: “For most of the history of the human race, however, the appearance of a comet has inspired fear, dire predictions, and irrational behavior.” This implies that the sight of a comet in 1985-86 inspired

interest and curiosity rather than fear. Option C best summarizes this inference. Option A is incorrect; a comet that cannot be seen would not inspire T-shirts and posters. Options B and D are contradicted by the passage. Option E incorrectly assumes that the appearance of Halley's comet predicted a disaster.

44. (F) The passage describes how people once feared comets because their apparitions were unpredictable. Then it provides scientific information about comets' composition and apparitions. Coincidence, not cause and effect, best characterizes the relationship between comet sightings and bad luck. Options G and H incorrectly assume that comets cause disasters. Option J is false; the passage says that in earlier times, people were in closer touch with the natural world than are most people today, yet those early people did not understand the relationship. Option K is contradicted by lines 15-17 and 56-58. Option F is best because it summarizes the correct understanding of the relationship between comets and disasters.

### (Urban Street Performers)

45. (A) Option B mentions only one function of traditional folk artists. No information is provided to support Option C. Options D and E may represent the writer's beliefs, but they do not describe the main theme of the passage: Indian street performers who used to be traveling artists have had to change as India changed. Thus Option A is the best answer.

46. (K) All the options describe threats to traveling performers. However, Option F, television, arrived after 1947 (lines 12-15). Option G names laws that were instituted after India's independence in 1947 (lines 12-13). Industrialization, Option H, is described as following court-centered entertainment (lines 7-12), an earlier threat to traveling performers. Option J can be eliminated since the slum clearances occurred after the performers moved to the cities. Option K is correct because the threat of court-based entertainment, which took place in the sixteenth century, came first.

47. (B) The author would not likely agree with Option A, since the passage describes changes for the better for modern-day street performers. Option C contradicts the facts presented in lines 32-35. Option D might be reasonable if the government still considered street performers beggars, but with their right to form cooperatives, this is no longer true. Option E may be true, but there is no evidence to support it; in fact, the opposite conclusion is suggested (lines 30-32). Option B is the best answer since the passage describes how these professions have moved to the cities.

48. (H) Lines 32-35 state that the government treats street performers like businesspeople. Careful reading of the passage eliminates the other options.

49. (E) It is easiest to check each option against the article. Options A and B state major strengths of the current folk artists, as described in this passage. Option C is a positive change that has occurred as a result of the new cooperatives. Option D can be eliminated because the urban street performers are indeed trying new methods such as allowing women to perform roles once reserved for men. Option E is correct. The last sentence suggests that street artists may return to their country villages to visit, but they always return home to the city.

50. (F) The passage describes the rediscovery as a turning point in the fortunes of the performers (lines 31-32). It is a turning point for the better; the artists have gained a world-wide audience (lines 35-40). With their new audiences, you may conclude that the artists have regained some of their former popularity (Option F). The other options are contradicted by information in the passage. The artists' legal status has been established (lines 32-35); they continue to live in cities (lines 55-58), and they have accepted many changes, including the participation of women and children (third paragraph).

51. (D) Find the greatest common factor by factoring each number into prime factors.

$$\begin{aligned} 105 &= 3 \cdot 5 \cdot 7 \\ 126 &= 2 \cdot 3^2 \cdot 7 \end{aligned}$$

Therefore, the GCF is  $3 \cdot 7 = 21$ .

52. (F) Assume that Evon's share of the profit is  $A$ . Simonne and Marco each received twice as much profit as Evon received, so Simonne received  $2A$  and Marco received  $2A$ . Now you can set up the equation:

$$\begin{aligned} A + 2A + 2A &= \$1,800 \\ 5A &= \$1,800 \\ A &= \$360 \end{aligned}$$

53. (E) Since the ratio of  $MN:NQ$  is  $3:2$ , and  $NQ$  is 30 cm,  $MN$  must be 45 cm. The ratio of  $NP:PQ$  is  $2:1$ , and their sum ( $NQ$ ) is 30 cm, so  $NP$  must be 20 cm and  $PQ$  10 cm. Therefore,  $MP$  is  $45 \text{ cm} + 20 \text{ cm} = 65 \text{ cm}$ .

54. (J)  $48.762 \times 100 = 4.8762 \times 10 \times 10^2$   
 $= 4.8762 \times 10^3$

Options G and K are numerically equivalent to the correct answer J, but they are incorrect because they are not written in the correct format for scientific notation: a number between 1 and 10, multiplied by a power of 10.

55. (D) The midpoint of two numbers on a number line is their average. Hence Q is at the average of  $-10$  and  $-2$ , i.e.,  $-6$ . P is at 3.  $\overline{PQ}$  is the distance between 3 and  $-6$ , which is  $(3 - -6) \text{ units} = 9 \text{ units}$ .

56. (G) Form an equation for the perimeter of the polygon with the information given:

$$\begin{aligned} 3x + 6(2x) + 12 + 13 &= 100 \\ 3x + 12x + 25 &= 100 \\ 15x &= 75 \\ x &= 5 \end{aligned}$$

57. (B)  $3|^{-7}| - 5|^{-11}| = 3 \times 7 - 5 \times 11 = 21 - 55$   
 $= -34$

58. (H)  $(\sqrt{36})(\sqrt{16}) = (6)(4) = 24$

59. (A) Three 14-hour shifts total 42 hours. It is easiest to figure time in blocks of 24 hours or 12 hours, because it will be the same time of day after 24 hours, and the same time on the clock after 12 hours. Note that  $42 = 24 + 12 + 6$ . 24 hours from 9:00 a.m. is 9:00 a.m. the next day. 12 hours after that is 9:00 p.m. 6 hours after that is 3:00 a.m. on the following day. So 42 hours after 9:00 a.m. is 3:00 a.m.

60. (J) First simplify the fraction:

$$\frac{4.2N}{1.2} = \frac{42N}{12} = \frac{7N}{2}$$

This number is an integer. This means that  $N$  must be an even number, otherwise,  $\frac{7N}{2}$  will not be an integer. We also know that  $N$  is an element of the set S. The only even number in S is 2.0. Therefore,  $N = 2.0$ . (Note that 0.2 and 1.4 are not even numbers, as only integers can be even or odd.)

61. (E) Numbers that have 10 as a factor always end with 0. Numbers that have 5 as a factor always end with 5 or 0. Therefore, numbers that have 5 as a factor but do not have 10 as a factor always end with 5. Only one number ends with 5 in a consecutive group of 10 numbers. Notice that the given set can be divided into 18 groups: 1–10, 11–20, 21–30, . . . , 161–170, and 171–178. Each of these groups contains exactly one number ending with 5. Therefore, there are 18 such numbers in the set.
62. (H) The possible values of  $n$  are 12, 14, 16, 18. (Note that 10 is *not* included.) Without computation, one can see that the mean is 15, as the numbers are equally distributed around 15.
63. (D) Note that the length of three squares together is exactly the diameter of the circle, which is 30 cm. The length of one side of a square is therefore 10 cm. The area of one square is 100 sq cm, so the area of five squares is 500 sq cm.

64. (H)  $\frac{40}{\frac{2}{5}} = \frac{40 \cdot 5}{2} = 100$

65. (E) Number of hours Elliott worked this week =  
 $6\frac{1}{2} \text{ hr} \times 3 = 19.5 \text{ hr}.$   
 Amount Elliott should be paid for this week =  
 $\$3.78 \times 19.5 = \$73.71.$

66. (H) Whenever you see a formula written in words, it is best to translate it into symbols first.  
 $\ddagger(w, x, y, z)$  = add  $w$  and  $x$ , multiply this result by  $y$ , then subtract  $z$   
 $= (w + x)y - z$   
 Therefore,  $\ddagger(3, 5, 6, 3) - \ddagger(4, 6, 3, 5)$   
 $= [(3 + 5)(6) - 3] - [(4 + 6)(3) - 5]$   
 $= 45 - 25$   
 $= 20$

67. (E) If 12 of the 25 picked the game as their favorite, then 13 of 25 did not. Therefore, the fraction of the class that did not pick the game is  $\frac{13}{25}$ .  
 To change a fraction into percent, multiply the fraction by 100%:

$$\frac{13}{25} = \frac{13}{25} \times 100\% = 52\%$$

68. (G) The only set of 3 different positive integers that fit this requirement is 1, 2, and 5 ( $1 \times 2 \times 5 = 10$ ). The sum of these integers is 8.

69. (D) The formula for the area of a circle is  $A = \pi r^2$ , so  $p = \pi r^2$ . The formula for the circumference of a circle is  $C = 2\pi r$ , so  $q = 2\pi r$ .

$$p = 2.5q$$

$$\pi r^2 = (2.5)(2\pi r)$$

$$\pi r^2 = 5\pi r$$

$$r^2 = 5r$$

$$r = 5$$

So the radius of the circle is 5 ft.

70. (J) The area of a trapezoid is  
 $\frac{1}{2} \cdot \text{height} \cdot \text{sum of the lengths of the // sides}.$   
 The area of this trapezoid is therefore  
 $\frac{1}{2} \cdot 15 \cdot (20 + 30) \text{ sq cm} = 375 \text{ sq cm}.$

71. (A) Just solve the equation. Write it as  $\frac{x^2}{20} = \frac{4}{5}$ .  
 Then multiply both sides of the equation by 20.

$$\frac{x^2}{20} = \frac{4}{5}$$

$$x^2 = \frac{4}{5} \cdot 20$$

$$x^2 = 16$$

$$x = 4 \text{ or } -4$$

Since  $x$  is positive, it is 4.

72. (K) Express the four numbers and their sum as:  
 $x + (x + 10) + (x + 20) + (x + 30) = 300$   
 $4x + 60 = 300$   
 $4x = 240$   
 $x = 60$

73. (D) The perimeter of the triangle is 24 cm. A square with a perimeter of 24 cm has a side of 6 cm. Thus its area is  $6^2$  sq cm, or 36 sq cm.

74. (H) The relationship between Jorge's age ( $x$ ) and his brother's age ( $y$ ) is  $x = (3 \cdot y) - 5$ .  
 If his brother's age is 8, then Jorge's age is  
 $3 \cdot 8 - 5 = 19.$

75. (D) According to the chart, 12-year-olds consume 16% of the total; 16% of 10,000 is 1,600 pounds.

76. (H) To find the median, first put the numbers in order from least to greatest: 16, 17, 17, 18, 19, 20, 21, 21, 21. The middle number (the fifth one) is 19.

77. (E) The values of variables  $x$  and  $y$  are given, and they can be substituted into the equation:  
 $5x(x - y) = 5(14)(14 - 11)$   
 $= 70(3)$   
 $= 210$

78. (H)  $\triangle WXZ$  and  $\triangle XYZ$  are similar. This means that  $\angle XWZ$  corresponds to  $\angle YXZ$  and both are equal to  $20^\circ$ . Also,  $\angle WXZ$  corresponds to  $\angle XYZ$  and they are equal. Let the measure of  $\angle WXZ$  be  $x^\circ$ . Then the measure of  $\angle XYZ$  is also  $x^\circ$ . These four angles together form the angles of  $\triangle WXY$ , so the sum of their measures is  $180^\circ$ . We thus have the equation:

$$\begin{aligned} 20 + x + 20 + x &= 180 \\ 2x + 40 &= 180 \\ x &= 70 \end{aligned}$$

Therefore, the measure of  $\angle WXY$  is  $70^\circ + 20^\circ = 90^\circ$ . (Note the convention for similar and congruent triangles. When we say that  $\triangle ABC$  is similar or congruent to  $\triangle XYZ$ , it also means that A corresponds to X, B corresponds to Y, and C corresponds to Z.)

79. (E)

$$\begin{aligned} 3(p - 4) &= 2(p + 1) \\ 3p - 3 \cdot 4 &= 2p + 2 \cdot 1 \\ 3p - 12 &= 2p + 2 \\ 3p - 2p &= 2 + 12 \\ p &= 14 \end{aligned}$$

80. (K) The probability of drawing a green candy from a jar of 20 candies is  $\frac{1}{4}$ , which is equivalent to  $\frac{5}{20}$ . Of the 20 candies, then, five are green. The problem asks you to reduce the probability of drawing a green candy to  $\frac{1}{6}$  by adding yellow candies to the jar. That means the number of green candies remains at 5, while the total number of candies in the jar is increased. Suppose  $y$  yellow candies are added. The total number of candies is now  $20 + y$ . The probability of picking a green candy is then  $\frac{5}{20 + y}$ . This probability is to be  $\frac{1}{6}$ . Thus you can set up an equation:
- $$\frac{1}{6} = \frac{5}{20 + y}$$
- Cross-multiply to get  $20 + y = 30$ , and  $y = 10$ .

81. (D) After Monday, John still has  $\frac{1}{2}$  his work left. If he does  $\frac{1}{4}$  of that on Tuesday, he has finished another  $\frac{1}{8}$  of his work.  $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$ , leaving  $\frac{3}{8}$  of the work to be done the rest of that week.
82. (F) Note that if 1 in. is equivalent to 2 ft, 1 sq in. is equivalent to 4 sq ft. Bedroom B consists of  $6 \cdot 4$  full squares and 6 half-squares. So its area in the floor plan is 27 sq in., which is equivalent to  $27 \cdot 4$  sq ft = 108 sq ft. Next, convert to square yards: 1 sq yd = 9 sq ft. So 108 sq ft = 12 sq yd.
83. (A) Nicki has  $n$  stamps. That is half the stamps that Mark has. So Mark has  $2n$  stamps. Nicki and Mark together have  $3n$  stamps, which is 100 more than Basilio has. So Basilio has  $3n - 100$  stamps.
84. (J) Since arc BED is part of a circle centered at A, the straight line segment  $\overline{AE}$  (not shown) has the same length as  $\overline{AB}$ , both being radii of that circle. Likewise,  $\overline{BE}$  (not shown) and  $\overline{AB}$  are the same. So  $BE = AB = AE$ , and triangle AEB is equilateral. The measure of angle EBA must be  $60^\circ$ .
85. (D) To solve this problem, look first for a known value. If Jae-Lynn will be 16 in 10 years, she is 6 now. Paula, who is 4 times older than Jae-Lynn, is 24 now. Four years ago, then, Paula was 20. Notice how the other options reflect possible misreadings of the question.
86. (G) The winner received 55% of 17,000 votes, or  $(0.55)(17,000) = 9,350$  votes. The loser received the remaining votes,  $17,000 - 9,350 = 7,650$  votes. To calculate how many more votes the winner received than the loser, subtract 7,650 from 9,350 to get 1,700. If you did not read the problem carefully, you might have stopped after calculating the number of votes received by the winner and selected Option K, or stopped after calculating the number of votes received by the loser and selected Option J.
- There is a simpler way to obtain the answer. The winner received 55% of the votes, so the loser received 45%. The difference between the number of votes received by the winner and loser is 10% of the votes, which is 1,700.
87. (A) Divide 142 by 15 to obtain the number of boxes Javial will fill. The remainder will be the number of candles in the last box. The answer is 9 full boxes with 7 candles left to go in the last box.

88. (G) The diagonals ( $\overline{WY}$  and  $\overline{XZ}$ ) are lines of symmetry of square WXYZ. Since points W, X, Y, and Z are points on the circle, the entire figure is also symmetrical along  $\overline{WY}$  and  $\overline{XZ}$ . The axis of symmetry for a circle is the diameter, so the diagonal of the square is equal to the diameter of the circle. Since the diagonal is 16 cm, the diameter is also 16 cm and the circumference is  $16\pi$ .

89. (B) You are given the following relationships:

$$660 \text{ ft} = 1 \text{ furlong}$$

$$1 \text{ yd} = \frac{1}{2} \text{ fathom}$$

The problem asks you to determine the relationship between fathoms and furlongs.

$$1 \text{ yd} = 3 \text{ ft} = \frac{1}{2} \text{ fathom}$$

$$1 \text{ fathom} = 2 \text{ yd} = 6 \text{ ft}$$

$$1 \text{ furlong} = 660 \text{ ft} = \frac{660}{6} \text{ fathoms} = 110 \text{ fathoms}$$

90. (H) Since  $x$  is known to be 3, insert it into the equation and solve for  $y$ :

$$6 \cdot 3 (2y - 3 \cdot 3) = 18$$

$$18 (2y - 9) = 18$$

$$2y - 9 = 1$$

$$2y = 10$$

$$y = 5$$

91. (D) The values of variables  $n$  and  $k$  are given, and they can be inserted into the equation:

$$\frac{4}{20} = \frac{13}{x}$$

Solve the equation by cross-multiplying:

$$4x = 260$$

$$x = 65$$

92. (H) It is given that  $QS = 6$  centimeters and that  $QR = RS$ . We can use that information to find the length of  $RS$ .

$$QS = QR + RS$$

Using substitution because  $QR = RS$ :

$$QS = RS + RS$$

$$QS = 2(RS)$$

$$6 = 2(RS)$$

$$3 = RS$$

Now we can calculate the length of  $\overline{ST}$ .

We know  $RT = 7$  cm from the diagram and we know  $RS = 3$  cm.

$$RT = RS + ST$$

$$7 = 3 + ST$$

$$4 = ST$$

The length of  $\overline{PT}$  is:

$$PT = PS + ST = 10 + 4 = 14 \text{ cm.}$$

93. (B) If Ralston Theater has  $x$  seats, and Baker Theater has twice as many seats plus another three, then  $y$  (Baker Theater) =  $2x + 3$ .

94. (J) The perimeter of rectangle ABCD is given (48 cm), but its length and width are not known. From the information about the circle, we can determine that the length is equal to the diameter of the circle and the width is equal to the radius. Therefore, the length is twice the width. Set up two equations that express what is known about length  $L$  and width  $W$ :

$$\text{Perimeter} = 2L + 2W, \text{ and}$$

$$L = 2W$$

Substitute the terms:

$$\text{Perimeter} = 2(2W) + 2W$$

$$48 = 4W + 2W = 6W$$

$$8 = W$$

The width of the rectangle is 8 cm. Now calculate the area  $A$  of the circle. Use the formula  $A = \pi r^2 = \pi 8^2 \text{ sq cm} = 64\pi \text{ sq cm}$ .

95. (E) Simply perform the calculations:

$$\begin{aligned} \left(\frac{1}{2} + \frac{2}{5}\right) \div \frac{2}{3} &= \left(\frac{5}{10} + \frac{4}{10}\right) \div \frac{2}{3} \\ &= \frac{9}{10} \div \frac{2}{3} \\ &= \frac{9}{10} \cdot \frac{3}{2} \\ &= \frac{27}{20} \end{aligned}$$

96. (F) Let  $x$  represent the score for the third game and set up an equation for calculating the mean score of the three games:

$$\frac{60 + 50 + x}{3} = 51$$

$$110 + x = 153$$

$$x = 43$$

97. (A) One side of the square is on the  $x$ -axis, and another side is on the  $y$ -axis. That means one corner of the square must be at the point where the axes intersect, which is the origin (0, 0). Depending on where the square is placed, the points in Options B through E might or might not be corners.

98. (K) Of the 27 marbles, 7 were black, 4 were yellow, and 16 were red. After 3 black marbles were removed, 24 marbles remained. Since none of the 3 marbles removed were red, there are still 16 red marbles in the can. The probability of a red marble being drawn next is  $\frac{16}{24}$ , or  $\frac{2}{3}$ .
99. (C) If Jasmine ate twice as much as Zoe, she ate  $\frac{2}{8}$  of the pizza. Together they ate  $\frac{3}{8}$ , leaving  $\frac{5}{8}$  remaining. Thus, the ratio of the amount they ate to the amount remaining is 3:5.

100. (H) This question can be solved only by evaluating each option to see which one **cannot** be odd. Since  $x$  is even,  $x + 1$  must be odd as it is the number after an even number. Likewise,  $2x + 1$  and  $2x - 1$  must be odd, as  $2x$  is always even. So F, J, and K cannot be the correct answers.  $\frac{x}{2}$  can be either odd or even. (For example, if  $x$  is 6, then  $\frac{x}{2}$  is odd; if  $x$  is 8, then  $\frac{x}{2}$  is even.) So G is not correct.  $\frac{x}{3}$ , on the other hand, **cannot** be odd. If it were odd, its product when multiplied by 3 (the product of two odd numbers) would be an odd number. However, the product of  $\frac{x}{3}$  and 3 is  $x$ , which is given to be an even number. So  $\frac{x}{3}$  cannot be odd, and H is the correct answer. (Note that  $\frac{x}{3}$  may not be an integer. This does not matter, because if it is not an integer, it cannot be an odd integer.)

### Answer Key for Sample Form A

Paragraph 1	11. A	21. D	31. C	41. E	51. D	61. E	71. A	81. D	91. D
T R S U Q	12. F	22. J	32. J	42. F	52. F	62. H	72. K	82. F	92. H
Paragraph 2	13. D	23. C	33. A	43. C	53. E	63. D	73. D	83. A	93. B
Q T R S U	14. J	24. K	34. H	44. F	54. J	64. H	74. H	84. J	94. J
Paragraph 3	15. A	25. B	35. B	45. A	55. D	65. E	75. D	85. D	95. E
Q S U R T	16. K	26. J	36. K	46. K	56. G	66. H	76. H	86. G	96. F
Paragraph 4	17. A	27. C	37. B	47. B	57. B	67. E	77. E	87. A	97. A
U T R Q S	18. K	28. J	38. F	48. H	58. H	68. G	78. H	88. G	98. K
Paragraph 5	19. C	29. A	39. C	49. E	59. A	69. D	79. E	89. B	99. C
Q U S T R	20. H	30. G	40. J	50. F	60. J	70. J	80. K	90. H	100. H



Student's First Name (please print)

Student's Last Name (please print)

Student's Home Address      Apartment      Borough      ZIP Code      (Area Code)      Home Telephone Number

**PART I VERBAL**

**SCRAMBLED PARAGRAPHS**

**Paragraph 1**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 2**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 3**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 4**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**Paragraph 5**

- The second sentence is    Q    R    S    T    U
- The third sentence is    Q    R    S    T    U
- The fourth sentence is    Q    R    S    T    U
- The fifth sentence is    Q    R    S    T    U
- The sixth sentence is    Q    R    S    T    U

**LOGICAL REASONING**

- |              |              |
|--------------|--------------|
| 11 A B C D E | 33 A B C D E |
| 12 F G H J K | 34 F G H J K |
| 13 A B C D E | 35 A B C D E |
| 14 F G H J K | 36 F G H J K |
| 15 A B C D E | 37 A B C D E |
|              | 38 F G H J K |
| 16 F G H J K |              |
| 17 A B C D E | 39 A B C D E |
| 18 F G H J K | 40 F G H J K |
| 19 A B C D E | 41 A B C D E |
| 20 F G H J K | 42 F G H J K |
|              | 43 A B C D E |
|              | 44 F G H J K |

**READING**

- |              |              |
|--------------|--------------|
| 21 A B C D E | 45 A B C D E |
| 22 F G H J K | 46 F G H J K |
| 23 A B C D E | 47 A B C D E |
| 24 F G H J K | 48 F G H J K |
| 25 A B C D E | 49 A B C D E |
| 26 F G H J K | 50 F G H J K |

Use this side for  
marking your  
answers to sample  
test Form B.

**PART II MATHEMATICS**

**MATHEMATICS PROBLEMS**

- |              |              |              |               |
|--------------|--------------|--------------|---------------|
| 51 A B C D E | 66 F G H J K | 81 A B C D E | 96 F G H J K  |
| 52 F G H J K | 67 A B C D E | 82 F G H J K | 97 A B C D E  |
| 53 A B C D E | 68 F G H J K | 83 A B C D E | 98 F G H J K  |
| 54 F G H J K | 69 A B C D E | 84 F G H J K | 99 A B C D E  |
| 55 A B C D E | 70 F G H J K | 85 A B C D E | 100 F G H J K |
|              |              |              |               |
| 56 F G H J K | 71 A B C D E | 86 F G H J K |               |
| 57 A B C D E | 72 F G H J K | 87 A B C D E |               |
| 58 F G H J K | 73 A B C D E | 88 F G H J K |               |
| 59 A B C D E | 74 F G H J K | 89 A B C D E |               |
| 60 F G H J K | 75 A B C D E | 90 F G H J K |               |
|              |              |              |               |
| 61 A B C D E | 76 F G H J K | 91 A B C D E |               |
| 62 F G H J K | 77 A B C D E | 92 F G H J K |               |
| 63 A B C D E | 78 F G H J K | 93 A B C D E |               |
| 64 F G H J K | 79 A B C D E | 94 F G H J K |               |
| 65 A B C D E | 80 F G H J K | 95 A B C D E |               |

# SAMPLE TEST, FORM B

## PART 1 — VERBAL

*Suggested Time — 75 Minutes*

45 QUESTIONS

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### SCRAMBLED PARAGRAPHS

PARAGRAPHS 1-5

**DIRECTIONS:** In this section, arrange each group of sentences to create the best paragraph. The first sentence for each paragraph is given; the remaining five sentences are listed in random order. Choose the order for these five sentences that will create the **best** paragraph, one that is well-organized, logical, and grammatically correct. Each correctly ordered paragraph is worth double the value of a question in any other section of the test. No credit will be given for responses that are only partially correct.

To keep track of your sentence order, use the blanks to the left of the sentences. For example, write “2” next to the sentence you think follows the first sentence, “3” next to the sentence you think follows “2,” and so on. You may change these numbers if you decide on a different order. When you are satisfied with your sentence order, mark your choices on your answer sheet.

---

#### Paragraph 1

In many cultures, a baby’s first steps are an occasion to be remembered.

- \_\_\_\_\_ Q. In traditional Indian families, however, those first steps are celebrated as a ceremonial event.
- \_\_\_\_\_ R. When a child is ready to begin walking, the parents fit it with specially designed ankle bracelets, adorned with gently ringing bells.
- \_\_\_\_\_ S. Some of these carts are intricately decorated to resemble the chariot of Krishna, another important Hindu deity.
- \_\_\_\_\_ T. The sound of these bells mimics the footsteps of the legendary child Rama, a major Hindu deity.
- \_\_\_\_\_ U. In addition, the child may be given a handcrafted walker or pushcart to provide support for its first steps.

CONTINUE ON TO THE NEXT PAGE ►

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**Paragraph 2**

The Midwestern plains of the United States experience more tornadoes than any other part of the country.

- \_\_\_\_\_ **Q.** This funnel is a rotating column of air, with a speed approaching 300 miles an hour.
- \_\_\_\_\_ **R.** Still, though tornadoes can be powerful and destructive, each one lasts only a few minutes and then disappears.
- \_\_\_\_\_ **S.** The fastest tornado wind speed ever recorded was 318 miles per hour, measured by a Doppler on Wheels radar in Oklahoma City in 1999.
- \_\_\_\_\_ **T.** It is here, meteorologists have observed, that the unsettled weather conditions during the spring months are nearly perfect for tornado formation.
- \_\_\_\_\_ **U.** When cold dry air from Canada passes over the Rocky Mountains and collides with warm moist air from the Gulf of Mexico, the resulting disturbance may form a violent funnel cloud.

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**Paragraph 3**

The giant panda, a native of the remote mountainous regions of China, is a most unusual bear species.

- \_\_\_\_\_ **Q.** The panda, on the other hand, subsists almost entirely on tender bamboo shoots.
- \_\_\_\_\_ **R.** The panda's paw is quite different; it has an overdeveloped bone jutting out like a thumb below its five other claws.
- \_\_\_\_\_ **S.** Most other bear species also have paws that are designed for running, stabbing, and scratching.
- \_\_\_\_\_ **T.** For example, most other bears are hunters and gatherers that prey on smaller animals and forage for roots and berries.
- \_\_\_\_\_ **U.** It is this thumb-like structure that permits the panda to grip bamboo shoots and strip them of their leaves.

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**Paragraph 4**

Most people would argue that it is impossible to tie a knot in the middle of a rope while holding both ends.

- \_\_\_\_\_ **Q.** If you do this without letting go of the rope, it will automatically tie itself into a simple knot as your arms unfold.
- \_\_\_\_\_ **R.** With your arms folded, bend down and grip one end of the rope in your right hand, the other in your left, and simply unfold your arms and draw the ends of the rope in opposite directions.
- \_\_\_\_\_ **S.** Begin by laying a short piece of rope or cord straight out on a table.
- \_\_\_\_\_ **T.** However, you can easily prove them wrong by using a simple trick.
- \_\_\_\_\_ **U.** Then, fold your arms completely, making sure that one hand is below its opposite elbow and the other hand above.

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**Paragraph 5**

The spirit of the American Revolutionary War is apparent in the songs that were sung during that war.

- \_\_\_\_\_ **Q.** Tradition has it that the American army band even played “Yankee Doodle” to the surrendering British at Yorktown in 1781.
- \_\_\_\_\_ **R.** Another American original, “Chester,” written by William Billings during the Revolution, was sung around many campfires by American troops.
- \_\_\_\_\_ **S.** The first American patriotic ballad, “The Liberty Song,” was published in 1768, well before the Revolution began.
- \_\_\_\_\_ **T.** The Americans liked the song, however, and later in the Revolutionary War, took it for their own.
- \_\_\_\_\_ **U.** Unlike those two, the song “Yankee Doodle,” also popular during the Revolution, had first been sung by the British in mockery of the colonial troops during the French and Indian War.

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# LOGICAL REASONING

## QUESTIONS 11-20

**DIRECTIONS:** Read the information given and choose the **best** answer to each question. Base your answer **only on the information given**.

In a logical reasoning test, certain words must be read with caution. For example, “The red house is **between** the yellow and blue houses” does not necessarily mean, “The red house is **between and next to** the yellow and blue houses”; one or more other houses may separate the red house from the yellow house or from the blue house. This precaution also applies to words such as **above, below, before, after, ahead of, and behind**.

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**11.** Five students are standing in a line according to their heights, from tallest to shortest.

- 1) Lisa is taller than Mickey, but shorter than Fernando.
- 2) Mickey is shorter than Noah, but taller than Jodi.
- 3) Noah is shorter than Fernando.

In which position is Noah?

- A.** first
- B.** second
- C.** third
- D.** fourth
- E.** Cannot be determined from the information given.

---

**12.** A person walking along a wooded path will pass five different trees.

- 1) The last tree is an elm.
- 2) The second tree is a maple.
- 3) The hickory tree is after the maple, but before the aspen.
- 4) One tree is an oak.

In which position is the aspen?

- F.** second
- G.** third
- H.** fourth
- J.** fifth
- K.** Cannot be determined from the information given.

**13.** There are two cars in the driveway.

- 1) One car is a convertible, the other is a sedan.
- 2) The convertible is driven only on Sundays.
- 3) One car runs on diesel fuel.
- 4) One car is driven only on Mondays and has a scratch on the door.
- 5) The car that does not have a scratch on the door runs on diesel fuel.

Based only on the information above, which of the following **must** be true?

- A.** The sedan runs on diesel fuel.
- B.** The sedan is driven on Sundays.
- C.** The convertible has a scratch on the door.
- D.** The convertible runs on diesel fuel.
- E.** The sedan is not driven on Mondays.

CONTINUE ON TO THE NEXT PAGE ►

14. John will not go to the party if Sarah goes. Sarah will go to the party if Peter's mother comes home in time.

Based only on the information above, which of the following **must** be true?

- F. If Peter's mother comes home in time, then John will not go to the party.
- G. If John does not go to the party, then Sarah will go.
- H. If Peter's mother does not come home in time, Sarah will not go to the party.
- J. Sarah will not go to the party unless John goes.
- K. If John goes to the party, then Peter will go.

Questions 15 and 16 refer to the following information.

In the code below, (1) each letter always represents the same word, (2) each word is represented by only one letter, and (3) in any given sentence, the letters may or may not be presented in the same order as the words.

M      O      R      T      Y      means  
"John    walked home by    himself."

X      N      M      Q      R      means  
"Sally    walked home with friends."

M      Z      R      X      N      means  
"Manuel walked home with friends."

Q      M      X      R      P      means  
"Ahmal    walked home with Sally."

15. Which letter represents the word "Manuel"?

- A. R
- B. M
- C. X
- D. Z
- E. Cannot be determined from the information given.

16. Which word is represented by the letter X?

- F. friends
- G. with
- H. home
- J. Sally
- K. Cannot be determined from the information given.

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- 
- 17.** All seniors in our club are highly sophisticated people. Unfortunately, some of them lack a sense of humor.

Which of the following statements is a valid conclusion from the statements above?

- A.** A sense of humor is important to sophistication.
  - B.** Some freshmen in our club lack a sense of humor.
  - C.** The most sophisticated people in our club are seniors.
  - D.** Most seniors in our club have a sense of humor.
  - E.** People with no sense of humor can be sophisticated.
- 

- 18.** At the horse show, four competitors stood in a line, each standing beside his or her horse.

- 1) Anita stood with the bay horse.
- 2) Pinh did not stand with the spotted horse.
- 3) Mia, who was behind Juan, stood with the white horse.
- 4) Juan stood directly behind Anita.
- 5) The chestnut horse was behind the bay horse.

Which competitor stood last in line?

- F.** Juan
- G.** Anita
- H.** Mia
- J.** Pinh
- K.** Cannot be determined from the information given.

- 
- 19.** Charlie has a headache. The doctor told Charlie that type X flu always comes with fever and a headache, while type Y flu always comes with a headache but no fever.

Based only on the information above, which of the following **must** be true?

- A.** If Charlie has a fever, then he must have type X flu.
  - B.** If Charlie does not have a fever, then he must have type Y flu.
  - C.** If Charlie has a fever, then he may have type X flu.
  - D.** A headache always means that a person has the flu.
  - E.** If Charlie has a fever, then he may have type Y flu.
- 

- 20.** The Gobi Desert receives an average of 3 inches of rain each year. The Sawli Desert receives more rainfall than any desert in the world, with an average yearly rainfall of 5 inches.

Based only on the information above, which of the following **must** be true?

- F.** Deserts are the driest places on earth.
- G.** Most deserts receive less than 3 inches of rainfall each year.
- H.** All deserts receive an average of less than 6 inches of rainfall each year.
- J.** Deserts always have at least some rainfall each year.
- K.** Each year, the Sawli Desert receives more rainfall than the Gobi Desert.

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# READING

## QUESTIONS 21-50

**DIRECTIONS:** Read each passage below and answer the questions following it. Base your answers **only on information contained in the passage**. You may reread a passage if you need to. Mark the **best** answer for each question.

Sir Arthur Conan Doyle's detective, Sherlock Holmes, is one of the most popular fictional characters of all time. The four novels and 56 short stories in which he appears have been the subject of more than 12,000 books by other authors. Many of these latter books refer to "the game," an intellectual exercise in which the players assume that Holmes was a real person. An important part of the game is analyzing the settings, characters, and plots of the stories as though they were historical fact rather than fiction. Complicating the game is the fact that Conan Doyle himself cared little for consistency and accuracy. Narrated in the first person by Watson, Holmes's friend, Conan Doyle's stories are full of contradictory details.

For example, in one story Watson claims he was shot in the shoulder, while in another the wound is in the leg. Because the unwritten rules of the game require that his every word be considered true, many writers have come up with clever theories explaining this inconsistency. Some claim that one bullet struck Watson in the shoulder and then passed into his leg. Others suggest he may have suffered as many as three separate wounds over the course of seven years.

The game has become ever more complex. Most of the players like to pretend that Conan Doyle's role was simply one of finding and publishing Watson's manuscripts. For example, the actual manuscript of Conan Doyle's *The Adventure of the Second*

*Stain* contains about 1,200 words of handwriting known not to be his own. Actually, the handwriting is that of Conan Doyle's wife, but the players maintain that it is Watson's handwriting.

One scholar has even gone so far as to publish a guidebook that locates the real world counterparts to every place mentioned in the stories. This required some ingenuity, since many places are fictitious. Other game players have placed plaques in various locations to commemorate fictional events. Some recent participants have become so caught up in the search for realistic detail that they occasionally undermine the enjoyment of a story. True believers, however, take pleasure in imagining that Holmes is still living on Baker Street in nineteenth-century London.

21. Which of the following best tells what this passage is about?
- A. More than 12,000 books have been written about Sherlock Holmes.
  - B. Some people believe that Arthur Conan Doyle did not really write the Sherlock Holmes stories.
  - C. Some Sherlock Holmes readers enjoy pretending that Sherlock Holmes was a real person.
  - D. The Sherlock Holmes game has become more complex.
  - E. The Sherlock Holmes stories contain many contradictions.

22. If a new Sherlock Holmes story were discovered, what would be the most likely effect?
- F. Scholars would lose interest in the game.
  - G. More would be known about the life of Arthur Conan Doyle.
  - H. The issue of Watson's bullet wound would be settled.
  - J. Game players would integrate details from the new story into the game.
  - K. New players would be discouraged from participating in the game.
23. The passage suggests that, in order to play the game, a player must
- A. be able to create believable characters.
  - B. travel frequently around England.
  - C. understand Arthur Conan Doyle's intentions in writing the Sherlock Holmes stories.
  - D. be willing to pretend that Conan Doyle's fictional detective was real.
  - E. be able to locate all of the fictional locations in the Sherlock Holmes stories.
24. Which of the following does the passage give as an example of the inconsistencies in the Sherlock Holmes stories?
- F. the discovery that Watson was a real person, while Sherlock Holmes was not
  - G. Watson's bullet wounds
  - H. a manuscript with handwriting that is not Conan Doyle's
  - J. the fictional locations
  - K. the plaques commemorating fictional events
25. Which of the following would **not** be consistent with the rules of the game?
- A. trying to prove that Conan Doyle's wife actually wrote the stories
  - B. looking for fictional places mentioned in the stories
  - C. assuming that Sherlock Holmes was a real person
  - D. demonstrating that a story's plot actually occurred
  - E. suggesting that Watson actually wrote the stories
26. Which of the following would most likely be an activity of the game?
- F. discovering more about the relationship between Conan Doyle and his wife
  - G. trying to prove that Holmes's solutions to baffling cases were often incorrect
  - H. determining how many copies of the Sherlock Holmes short stories and novels have been sold
  - J. reading other detective stories written at the same time as the Sherlock Holmes stories
  - K. figuring out where Watson lived

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The legendary Bedouin tribes of Saudi Arabia, a country made wealthy by the oil industry, still live the nomadic life of desert herdsmen. A deeply religious people, the Bedouin (pronounced be´-doo-in) value the laws and customs handed down to them through many generations. Year in and year out their lives follow the simple, rigorous calendar of the desert. In autumn, a tribe’s migration begins. Every few days, after its herds of camels and sheep have grazed and watered, the tribe moves to a new place. This cycle ends only in the severe heat of the following summer, when the herds are settled near a town to wait once again for autumn.

To people from other regions, the desert seems forbidding and lonely, but the Bedouin feel at home on its sands. They are skilled in recognizing subtle differences in the landscape and easily distinguish between different kinds of sand. Perhaps it is due to the desert’s vastness that the Bedouin cherish family and community. They welcome visitors and are known for their willingness to share what they have. Large family groups often gather together in a tent to tell stories and discuss the details and events of each other’s day.

The Bedouin are extremely skilled in tracking, and their talents are often in demand by the Saudi police. In one famous criminal case, a Bedouin elder was asked to examine the footprint left by a killer. A year later, while visiting a mosque, the elder recognized the culprit’s footprint in the sand. The police soon arrested the unlucky murderer as he left the mosque.

The Bedouin’s time-honored ways result from centuries of coping with their inhospitable environment. Occasionally they adopt new ways, but only when change helps them deal with the hardships of desert life. For example, they use pick-up trucks to move their belongings and families and to carry water, but they continue in their work as desert herdsmen. Bedouin

people often say they would not be Bedouin without sheep and camels to provide milk, meat, cloth, and hides.

27. Which of the following best tells what this passage is about?
- A. the rhythms of desert life
  - B. storytellers of the desert
  - C. how to survive in the desert
  - D. legendary tracking ability of the Bedouin
  - E. the modern life of a nomadic people
28. When does the yearly migration of the tribes begin?
- F. in the severe heat of summer
  - G. after summer is over
  - H. when the tribe has finished doing business in town
  - J. when summer begins
  - K. when the Bedouin have enough water
29. The Bedouin have allowed certain modernizations when those changes
- A. help them cope with their harsh existence.
  - B. are required by their religion.
  - C. will shorten the length of their migration.
  - D. do not replace something traditional.
  - E. make it possible to avoid desert travel.
30. Which of the following facts most clearly suggests that the Bedouin have recently shared some of the wealth of Saudi Arabia?
- F. They spend their summers near a town.
  - G. They own herds of camels and sheep.
  - H. They are generous to visitors.
  - J. They own pick-up trucks.
  - K. They travel wherever they wish.
31. Which of the following has had the **least** influence on the Bedouin lifestyle?
- A. the desert
  - B. their herds
  - C. their religious beliefs
  - D. their nomadic travels
  - E. the oil industry

- 32.** The story of the Bedouin elder who recognized a criminal's footprint was included in order to illustrate
- F.** the Bedouins' deep religious beliefs.
  - G.** the closeness of the Bedouin community.
  - H.** the cooperation between the Bedouins and their elders.
  - J.** the Bedouins' tracking ability.
  - K.** how Bedouins have adopted new ways yet kept many old traditions.

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Nearly all green plants on earth make their own food using sunlight, water, and nutrients drawn from the soil through their roots. One of the most important nutrients is nitrogen compounds, derived from decomposing organic matter. However, some plants live in wet, marshy areas where such compounds have been washed out of the soil. Without them, these plants could not produce their own food and would quickly die.

How do these plants survive? Some plant species have developed ways to trap small animals—usually fleas, flies, and spiders, but occasionally mice or frogs—whose bodies contain nitrogen compounds. Because they can digest living animals, these plants are called “carnivorous” plants, although none of them actually has a mouth or teeth. Instead, the trapped animals are digested by juices secreted by the leaves of the plants.

Most carnivorous plants use a “passive” trap, which means that they employ no moving parts to capture their prey. Passive trappers include the pitcher plant, the sundew, and the butterwort. Pitcher plants are so called because their leaves curl to form a pitcher or hollow reservoir in which rainwater collects. Many are brightly colored to lure insects inside the pitcher to sip nectar. The walls of the reservoir are slippery, and eventually the insect slips into the pool of water and drowns. The leaves of the sundew and the butterwort are also covered with sticky, sweet nectar. Once an insect alights on a leaf, the nectar acts as flypaper, holding the insect fast as the leaves secrete their digestive juices.

The best-known “active” trapper species is the Venus flytrap, native to the swamps of North and South Carolina. Its leaves are brightly colored and produce a sweet-smelling nectar. Each leaf consists of two lobes joined by a hinge, like a clamshell, and each lobe is edged with stiff bristles called cilia. Inside each lobe are three

trigger hairs. When the trigger hairs are brushed by an insect, the bristles come together to form the bars of a cage, and the insect is trapped. Within about ten days the insect becomes a nitrogen-rich soup of nutrients that is absorbed by the plant. Then the trap opens again, ready to attract its next victim. One flytrap may capture and digest three “meals” per month.

Perhaps the most unusual active trapper is the bladderwort. The bladderwort floats below the surface of the water and extends a network of leaves, which are like little airbags or bladders only half a centimeter long. Like the leaves of a Venus flytrap, the bladders are equipped with trigger hairs at the opening of a trapdoor that opens in only one direction—inward. While awaiting its prey, the bladder lies limp and empty. When a small animal brushes the trigger hairs, the trapdoor springs open, allowing water to rush in. The prey is sucked inside, the trapdoor closes, and the bladderwort obtains the nutrients it needs to survive.

33. Which of the following best tells what this passage is about?
- A. the adaptations that carnivorous plants have made to get nutrients
  - B. the superiority of the bladderwort over other carnivorous plants
  - C. the kinds of environments in which carnivorous plants thrive
  - D. the similarities between carnivorous animals and carnivorous plants
  - E. the importance of nitrogen to green plants
34. What does the passage suggest about carnivorous plants?
- F. They feed exclusively on insects.
  - G. They live longer than other green plants.
  - H. They are unable to absorb nitrogen compounds.
  - J. They are found only in the southern United States.
  - K. They grow in wet, swampy areas and marshes.

35. Which of the following phrases conveys the same or most nearly the same meaning as the word “fast” in line 38?
- A. firmly
  - B. rapidly
  - C. crushingly
  - D. helplessly
  - E. unexpectedly
36. Which of the following is **not** used by carnivorous plants to trap and hold prey?
- F. sticky liquid
  - G. mouth with teeth
  - H. suction
  - J. hinged leaves that fold together
  - K. a pool of water
37. Why are the plants in the passage called carnivorous?
- A. They have mouths with teeth.
  - B. They are attractive to insects and small animals.
  - C. They capture and digest live animals.
  - D. They have stomachs and digestive fluids.
  - E. They digest other plants.
38. Why is a victim unable to escape from the bladderwort after it is sucked into the bladder?
- F. The sticky nectar keeps it stuck inside.
  - G. It is trapped between the two lobes of the bladder.
  - H. It is entangled in the cilia.
  - J. The trigger hairs come together to form the bars of a cage.
  - K. The trapdoor opens only inward.

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Sometimes in nature, a plant or animal depends on another species for its survival. Once in a while, the existence of a single species is crucial to the survival of a large number of other life forms. An excellent example of such a species is the sea otter, a carnivorous marine mammal that lives in the rich kelp forests (dense areas of seaweed) in the coastal waters of the Pacific Ocean.

Sea otters have long been hunted for their valuable and beautiful fur. Before the governments of the United States and several other countries enacted laws banning their slaughter early in the twentieth century, the sea otter's numbers were dangerously low. Though they presently occupy only a fraction of their original habitat range, sea otters are thriving again. Today, they are often seen in California coastal waters in a characteristic pose: floating happily on their backs while eating a seemingly endless supply of seafood.

The sea otter seldom visits land, except to escape severe wind and waves or to give birth to young. It is quite at home in the kelp forest, which provides protective cover from enemies (including sharks and killer whales) and serves as an abundant source of its favorite seafoods. A sea otter may consume as much as twenty pounds of shellfish a day, feasting on mollusks, abalone, crabs, and its favorite treat—sea urchins.

The sea otter's eating habits are good news for the other inhabitants of its environment. Another big eater, the sea urchin, lives on a diet of kelp and seaweed. In some areas, uncontrolled sea urchin growth has devastated kelp forests. When sea urchin populations are held in check, and water pollution or shoreline development do not interfere, kelp forests generally thrive. Many varieties of fish and shellfish live in these seaweed forests, attracting still more animal species to nearby shores. For example, the survival of bald eagles and harbor

seals depends on the availability of such marine life. Had the hunting of sea otters continued unabated into the twentieth century, the damage to this interdependent coastal community would have been much more far-reaching than the loss of an individual species.

39. Which of the following best tells what this passage is about?
- A. the sea otter's key role in kelp forests
  - B. why sea urchins are a threat to the ecology of the Pacific
  - C. how the sea otter was saved from extinction
  - D. the origin of kelp forests
  - E. the ecology of the Pacific coast
40. Why do sea otters leave the water?
- F. to sleep
  - G. to find food
  - H. to avoid violent storms
  - J. to escape from predators
  - K. to avoid water pollution
41. Which of the following, if it were to occur, could be caused in part by sea otters' actions?
- A. too much commercial fishing in coastal waters
  - B. a sharp decrease in shellfish populations
  - C. the devastation of kelp forests
  - D. the extinction of killer whales
  - E. the loss of bald eagle nesting areas
42. The passage implies that laws were passed banning the slaughter of sea otters because
- F. sea otters were being hunted only for pleasure.
  - G. other forms of coastal marine life were in decline.
  - H. sea otters were in danger of becoming extinct.
  - J. sea otters were crucial for kelp forests to thrive.
  - K. many people find sea otters very cute.

43. Which of the following situations is most like the one involving sea otters and sea urchins as it is presented in the passage?
- A. Parasites are removed from the digestive system of a mammal and the mammal dies.
  - B. Human beings increase their use of pesticides and the populations of many bird species decrease.
  - C. Acid rain, an industrial pollutant, causes dramatic changes in many forest ecosystems.
  - D. Koala bear populations survive only if the bears obtain sufficient quantities of eucalyptus leaves.
  - E. An area's wolf population disappears and the deer population increases dramatically.
44. Which of the following has **not** represented a threat to sea otter populations?
- F. water pollution
  - G. shoreline development
  - H. fur hunters
  - J. sharks
  - K. harbor seals

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If you look around most preschool classrooms, you'll notice some common elements: rows of beads to count; wooden blocks and textured objects to touch; and furniture made to the scale of a small child. All of these familiar objects reflect the deep influence of Maria Montessori and her theory of education.

Born in 1870 in the Italian village of Chiaravalle, Maria moved to Rome with her family when she was five years old. Her mother encouraged her to pursue broader schooling than most girls received at the time. Maria began attending a boys' technical school at age 13, against her father's wishes but with her mother's support. She spent seven years studying engineering—and developing ideas about what a school should **not** be like. Although she was a good student, she felt stifled by the strictness, formality, and emphasis on learning by memorizing.

Eventually Montessori enrolled as a medical student at the University of Rome. In 1896 she graduated as the first female doctor in Italy. The following year, she joined the staff at a hospital for children with developmental disabilities. As she observed her patients, Montessori realized that many belonged in school, not in a hospital. Though not trained as a teacher, she wanted to find ways to educate these children.

Montessori drew ideas from anthropology, psychology, and medicine to develop her educational methods. She believed that children's personalities form as children interact with their environment. Everything they experience, she thought, becomes part of them. Montessori believed that the classroom environment was part of education. She was the first educator to provide child-size chairs and tables.

She also believed that education is a natural process that each student conducts in his or her own way. Teachers can help the process, but they should not attempt to

direct it or change it. Children were given the freedom to learn in their own way, while at the same time required to follow classroom rules. In contrast to the commonly held view that children should be “seen and not heard,” Montessori's teachers allowed their students to discover knowledge without interference.

In 1900, Montessori put her ideas into practice by opening a small school for children with developmental disabilities. The results were remarkable. Although her students were thought to lack ability, they learned to read, write, and participate in classroom activities. In 1907, Montessori founded a school for preschool children in one of Rome's poorest neighborhoods. Most of the children were shy and fearful or unruly and wild, but all responded quickly to Montessori's methods. Her students' success made Montessori famous, and she traveled the world to spread her ideas, revolutionizing education everywhere she went.

Montessori had her critics as well as her admirers. Some claimed that her methods placed too much emphasis on hands-on learning instead of intellectual development. Others questioned whether young children could achieve their own education without the structure and knowledge that a good teacher can provide. But educators agree that Maria Montessori recognized the universal characteristics that all children share, and she taught the world that each child is unique, admirable, and worthy of respect.

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45. Which of the following best tells what this passage is about?
- A. how anthropology, psychology, and medicine can help children learn
  - B. the history of children's education in Italy
  - C. an important educator and the ideas she promoted
  - D. the universal characteristics that children share
  - E. how attitudes toward educating girls have changed
46. Maria Montessori believed that children's personalities form
- F. through formality and strict discipline.
  - G. as a result of interaction with their surroundings.
  - H. when children spend time in schools instead of hospitals.
  - J. when children's intelligence and ability are high enough.
  - K. after age six.
47. In 1907, Montessori established a school for
- A. children with developmental disabilities.
  - B. boys who were studying engineering.
  - C. children who lived in Chiaravalle.
  - D. young children in a poor neighborhood.
  - E. teachers who wanted to learn the Montessori method.
48. The author includes information about Montessori's childhood to demonstrate that
- F. she had a good relationship with both of her parents.
  - G. she was never diagnosed with a developmental disability.
  - H. becoming an educator had always been one of her goals.
  - J. education was of primary importance throughout her life.
  - K. her interest in engineering had influenced her career.
49. What is the most likely reason that the author began the passage by describing familiar objects found in preschool classrooms?
- A. to demonstrate how Montessori's method has shaped preschool education
  - B. to argue that the Montessori method does not live up to its claims
  - C. to illustrate the influence of Montessori's own schooling
  - D. to give an example of what a school should **not** be like
  - E. to show that students cannot learn without a teacher
50. How were Maria Montessori and her mother alike?
- F. Both attended technical school to study engineering.
  - G. Both supported her father's wishes for her educational goals.
  - H. Both believed that girls should have access to the educational system.
  - J. Both held that a child's personality was formed through interaction with his or her surroundings.
  - K. Both believed that classrooms should be less strict and formal.

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# PART 2 — MATHEMATICS

*Suggested Time — 75 Minutes*

50 QUESTIONS

## GENERAL INSTRUCTIONS

Solve each problem. Select the **best** answer from the choices given. Mark the letter of your answer on the answer sheet. You can do your figuring in the test booklet or on paper provided by the proctor. **DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.**

### 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 problem 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 all fractions to lowest terms.

51.  $M$  is 20% of  $N$ , and  $N$  is 5% of 1,000. What is the value of  $M$ ?

- A. 10
- B. 40
- C. 100
- D. 250
- E. 1,000

52.



If  $\overline{XY}$  is divided into 3 equal parts by points R and S (not shown), what position will point R fall on? (Assume  $R < S$ .)

- F. 2
- G. 2.5
- H. 3
- J. 4
- K. 6

53. Convert  $\frac{5}{16}$  to decimal form.

- A. 0.31
- B. 0.31125
- C. 0.312
- D. 0.3125
- E. 5.16

54. If  $n$  is positive and  $n^2 = 51$ , between which two numbers does  $n$  lie?

- F. 5 and 6
- G. 6 and 7
- H. 7 and 8
- J. 8 and 9
- K. 9 and 10

CONTINUE ON TO THE NEXT PAGE ►

55.

## SIT-UPS IN GYM CLASS

Sit-ups	Number of Students
20	5
21	3
25	2
27	2

The table above shows the number of sit-ups completed by 12 students in gym class. What is the mean number of sit-ups completed?

- A. 22.25
- B. 23
- C. 23.25
- D. 27
- E. 93

56. What is the **greatest** prime number less than 40?

- F. 31
- G. 37
- H. 38
- J. 39
- K. 41

57.  $2x(3y + 1) =$

- A.  $3y + 2x$
- B.  $5xy + 2x$
- C.  $6xy + 1$
- D.  $5xy + 2x + 1$
- E.  $6xy + 2x$

58. What is the **least** integer greater than  $\frac{27}{4}$ ?

- F. 5
- G. 6
- H. 7
- J. 8
- K. 9

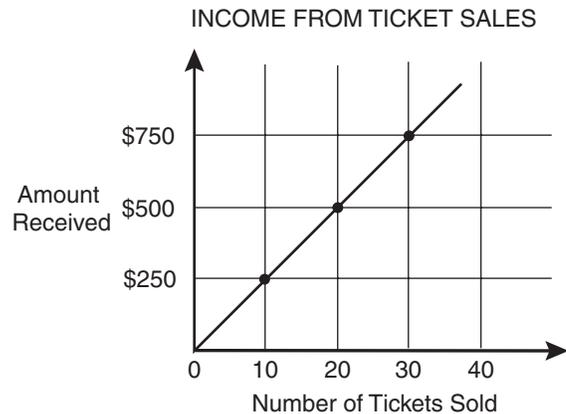
59. P is a point that is not on line  $m$ . How many lines can be drawn through P that form a  $30^\circ$  angle with line  $m$ ?

- A. 0
- B. 1
- C. 2
- D. 3
- E. The number varies.

60. At 7:00 a.m., the temperature was  $12^\circ$  **below zero** Fahrenheit. Then the temperature rose  $3^\circ$  per hour for 9 hours. What was the temperature at 2:00 p.m.?

- F.  $21^\circ$
- G.  $9^\circ$
- H.  $6^\circ$
- J.  $3^\circ$
- K.  $-6^\circ$

61.

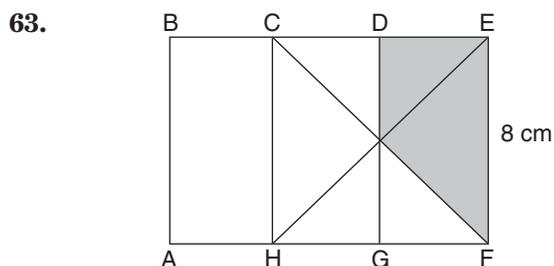


The graph above shows the relationship between the number of tickets sold and the amount of money received from the sale. What is the price of one ticket?

- A. \$20.00
- B. \$25.00
- C. \$25.50
- D. \$50.00
- E. \$250.00

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62. The product of a nonzero integer and  $-1$  has the same value as the square of the integer. What is the integer?
- F.  $-2$   
 G.  $-1$   
 H.  $0$   
 J.  $1$   
 K.  $2$



$ABDG$  and  $HCEF$  are squares, and  $\overline{BCDE}$  is a straight line segment.  $\overline{DG}$  and the diagonals  $\overline{CF}$  and  $\overline{HE}$  pass through the same point. What is the area of the shaded region?

- A. 16 sq cm  
 B. 24 sq cm  
 C. 32 sq cm  
 D. 40 sq cm  
 E. 56 sq cm

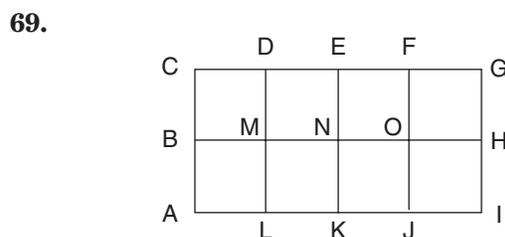
64. Which of the following is equivalent to the inequality  $10 < x - 6$ ?
- F.  $x < 4$   
 G.  $x > 4$   
 H.  $x > -4$   
 J.  $x < 16$   
 K.  $x > 16$

65.  $(13 + 2x) - (4 - x) =$
- A.  $9 - 3x$   
 B.  $9 + x$   
 C.  $9 + 3x$   
 D.  $13 + 3x$   
 E.  $17 + x$

66. What is the difference between 90% of 9 and 9% of 90?
- F. 0  
 G. 2  
 H. 7.29  
 J. 10  
 K. 81

67. If  $27,783 = 3^x \cdot 7^y$ , what is  $xy$ ?
- A. 3  
 B. 4  
 C. 9  
 D. 12  
 E. 21

68. A train traveling at a speed of 30 miles per hour passes point A on its way to point B. At the same time, on a parallel track, another train traveling at a speed of 70 miles per hour passes point B on its way to point A. If point A and point B are 300 miles apart, how far from point B will the trains meet?
- F. 240 mi  
 G. 210 mi  
 H. 150 mi  
 J. 140 mi  
 K. 90 mi



The figure above is made up of eight squares. How many rectangles in the figure are similar to BCEN? (Do not count BCEN itself.)

- A. 3  
 B. 5  
 C. 9  
 D. 10  
 E. 11

---

70. One-half the sum of two numbers is 9. If one of the numbers is 5, what is the product of the two numbers?

- F. 45
- G. 65
- H. 85
- J. 105
- K. 115

---

71. There are 10,000 fish in a pond. Of 50 fish caught in a net, 35 are female and 15 are male. Which is the best estimate of the number of male fish in the pond before the 50 fish were caught?

- A. 750
- B. 1,500
- C. 3,000
- D. 3,500
- E. 7,000

---

72. The area of a rectangular rug is 70 square feet. If the width is 5 feet, what is the perimeter?

- F. 14 ft
- G. 19 ft
- H. 38 ft
- J. 150 ft
- K. 350 ft

---

73. Mei-Ling has paints in 4 different colors. If she is going to paint the inside of a box with one color and the outside of the box with another color, in how many different ways can she paint the box?

- A. 2
- B. 4
- C. 6
- D. 8
- E. 12

---

74. If  $\hat{x} = \frac{1}{x}$ , what is the value of  $3 \cdot \hat{3}$ ?

- F.  $\frac{1}{9}$
- G.  $\frac{1}{3}$
- H. 1
- J. 3
- K. 9

---

75. What is the value of  $(x + y)(y - x)$  when  $x = 5.5$  and  $y = 4.5$ ?

- A. -10
- B. 0
- C. 9
- D. 10
- E. 11

---

76. Lindsey is now  $x$  years old and Xiu Dan is 2 years older than Lindsey. In terms of  $x$ , how old was Xiu Dan 3 years ago?

- F.  $x$
- G.  $x - 1$
- H.  $x - 3$
- J.  $x - 5$
- K.  $2x - 3$

---

77. A cylindrical soup can is 4 inches tall and has a radius of  $1\frac{1}{2}$  inches. What is the area of a label that will completely cover the side of the can, with no overlap (not including the top and bottom)?

- A. 6 sq in.
- B. 12 sq in.
- C. 16 sq in.
- D.  $6\pi$  sq in.
- E.  $12\pi$  sq in.

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78.  $R = 3 \cdot 3 \cdot 7 \cdot 11$   
 $S = 3 \cdot 5 \cdot 7 \cdot 7$

What is the least common multiple of R and S?

- F.  $3 \cdot 5$
- G.  $3 \cdot 7$
- H.  $3 \cdot 5 \cdot 7 \cdot 11$
- J.  $3 \cdot 3 \cdot 5 \cdot 7 \cdot 7 \cdot 11$
- K.  $3 \cdot 3 \cdot 3 \cdot 5 \cdot 7 \cdot 7 \cdot 7 \cdot 11$

- 
79. In a scale diagram, 1 inch represents 100 feet. How many square inches on the diagram represent 1 square foot?

- A. 0.000001 sq in.
- B. 0.0001 sq in.
- C. 0.01 sq in.
- D. 0.1 sq in.
- E. 100 sq in.

- 
80. Nadia put 23 coins (nickels, dimes, and pennies) with a total value of \$1.22 into a jar. She removed seven dimes, seven nickels, and seven pennies. Which coins remain in the jar?

- F. 2 pennies
- G. 2 nickels
- H. 2 dimes
- J. 1 nickel and 1 penny
- K. 1 dime and 1 penny

- 
81.  $x$ ,  $y$ , and  $z$  are consecutive multiples of 5, counting from smallest to largest. What is  $x + y$  in terms of  $z$ ?

- A.  $z + 10$
- B.  $z + 15$
- C.  $2z - 15$
- D.  $2z + 5$
- E.  $3z - 5$

- 
82. A sheet of cardboard measuring 12 inches by 54 inches is to be cut into squares with equal sides. What is the **largest** possible size of the squares if they are all to be equal, without any waste?

- F. 3 in. by 3 in.
- G. 4 in. by 4 in.
- H. 6 in. by 6 in.
- J. 12 in. by 12 in.
- K. 54 in. by 54 in.

- 
83. A pyramid has a square base. Its volume is 48 cubic centimeters and its height is 4 centimeters. What is the length of one side of the base?

- A. 2 cm
- B. 6 cm
- C. 12 cm
- D. 36 cm
- E. 144 cm

- 
84. What fraction, reduced to its lowest terms, is halfway between  $\frac{4}{5}$  and 0.9?

- F.  $\frac{1}{2}$
- G.  $\frac{2}{3}$
- H.  $\frac{17}{20}$
- J.  $\frac{6}{7}$
- K.  $4\frac{1}{2}$

CONTINUE ON TO THE NEXT PAGE ►

85. Which of the following indicates that  $s$  is greater than or equal to half the value of  $t$  and that  $t$  is greater than 0?

- A.  $s \geq \frac{t}{2} > 0$   
 B.  $s \geq 2t > 0$   
 C.  $s > \frac{t}{2} \geq 0$   
 D.  $s \leq \frac{t}{2} > 0$   
 E.  $s \leq 2t < 0$

86. If  $x = 2$  and  $y = 3$ , what is the value of  $\frac{x^y}{y^x}$ ?

- F.  $\frac{8}{27}$   
 G.  $\frac{4}{9}$   
 H.  $\frac{2}{3}$   
 J.  $\frac{8}{9}$   
 K. 1

87. MUSEUM VISITORS

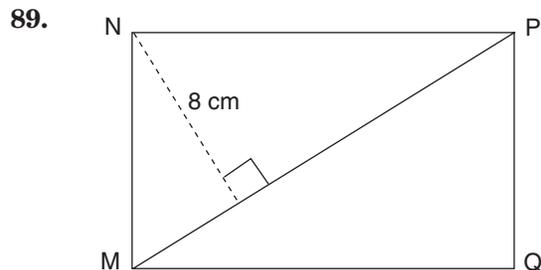
Day	1	2	3	4	5	6	7	8	9
Number of Visitors	142	106	117	127	106	113	106	95	117

What was the median number of visitors for the days shown?

- A. 95  
 B. 106  
 C. 113  
 D. 117  
 E. 142

88. In a certain month, Latoya earned twice as much as Jaclyn earned. Pei-Lin earned three times as much as Jaclyn. If Pei-Lin earned \$240, how much did Latoya earn?

- F. \$80  
 G. \$160  
 H. \$240  
 J. \$360  
 K. \$480



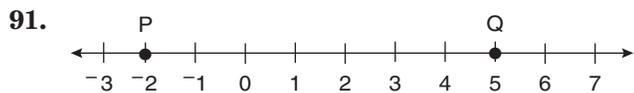
If the area of the rectangle above is 112 square centimeters, what is the length of  $\overline{MP}$ ? (*Hint: The area of rectangle MNPQ is twice that of triangle MNP.*)

- A. 7 cm  
 B. 14 cm  
 C. 16 cm  
 D. 28 cm  
 E. 56 cm

90. Suppose that 387 people will travel on a shuttle with room for 420 people. Each compartment seats 14 people before the next compartment opens. How many people will ride in the last compartment that opened?

- F. 8  
 G. 9  
 H. 11  
 J. 12  
 K. 31

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Point R (not shown) is located on line segment  $\overline{PQ}$  so that  $\overline{PR}$  is 6 times as long as  $\overline{RQ}$ . What is the location of point R?

- A. -1
- B. 2
- C. 3
- D. 4
- E. 6

92. Tamika's salary is \$26,000. Joe's salary is \$24,500. At the end of each year, Tamika is given a \$500 raise and Joe is given an \$800 raise. After how many years will Joe and Tamika be earning the same amount?

- F. 2
- G. 3
- H. 4
- J. 5
- K. 6

93. When  $n$  is divided by 5, the remainder is 2. What is the remainder when  $n + 4$  is divided by 5?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 6

94. From a box containing 5 black marbles, 8 pink marbles, 6 white marbles, and 5 yellow marbles, Ingrid removed 4 marbles, one of which was black. If she removes one more marble at random, what is the probability that it will be black?

- F.  $\frac{1}{6}$
- G.  $\frac{4}{21}$
- H.  $\frac{1}{5}$
- J.  $\frac{5}{21}$
- K.  $\frac{1}{4}$

95. For how many values of  $n$  is  $\frac{n-6}{6-n} > 0$ ? (Assume  $n \neq 6$ .)

- A. 0
- B. 1
- C. 2
- D. 3
- E. 5

96. In a list of numbers that starts with the number 13, every number is 14 less than twice the number that comes just before it. What will the fourth number in the list be?

- F. -2
- G. 4
- H. 6
- J. 9
- K. 10

97. One diagonal of a square lies on the  $y$ -axis of a coordinate system. The coordinates of one corner of the square are (3, 7). What are the coordinates of the opposite corner?

- A. (-3, 7)
- B. (7, 3)
- C. (3, -7)
- D. (-3, -7)
- E. (-7, -3)

---

**98.** Maria can paint  $\frac{2}{3}$  of a square wall with 1 gallon of paint. How much of that same wall could she paint with  $\frac{3}{5}$  of a gallon?

**F.**  $\frac{1}{4}$

**G.**  $\frac{1}{3}$

**H.**  $\frac{2}{5}$

**J.**  $\frac{1}{2}$

**K.**  $\frac{5}{2}$

---

**99.** Katie swam  $\frac{3}{4}$  as many laps as Ruby. Katie swam  $3\frac{1}{2}$  laps. How many laps did Ruby swim?

**A.**  $2\frac{1}{4}$

**B.**  $2\frac{5}{8}$

**C.**  $2\frac{3}{4}$

**D.**  $4\frac{1}{4}$

**E.**  $4\frac{2}{3}$

---

**100.** The mean score of 10 players was 6.5. One player's score was dropped, changing the mean of the remaining scores to 6.0. What score was dropped?

**F.** 4.5

**G.** 5

**H.** 10

**J.** 11

**K.** 54

**THIS IS THE END OF THE TEST. IF TIME REMAINS, YOU MAY CHECK YOUR ANSWERS TO PART 2 AND PART 1. BE SURE THAT THERE ARE NO STRAY MARKS, PARTIALLY FILLED ANSWER CIRCLES, OR INCOMPLETE ERASURES ON YOUR ANSWER SHEET. ■**

Scrambled Paragraphs

Paragraph 1 (QRTUS)

The given sentence introduces the topic of children learning to walk. Q is next because it provides an example of how a traditional Indian family celebrates a child’s first steps. R links back to Q, with its beginning phrase, “When a child is ready to begin walking ...”, and tells us that the child is given ankle bracelets with ringing bells. T follows R with its reference to the sound of the bells. Next is U, which begins, “In addition ...”, and describes another traditional Indian practice, the child’s use of a walker or pushcart. S follows U with its description of decorated pushcarts.

Paragraph 2 (TUQSR)

The topic of tornadoes in the Midwest opens the paragraph. The opening phrase in T (“It is here ...”) ties it back to the given sentence and explains why tornadoes are common in that part of the United States. U continues the explanation of the weather conditions that lead to the formation of a funnel cloud. Q describes a funnel cloud—a rotating column of air moving at a tremendous rate of speed. S is next, connecting to Q with another reference to the tornado’s speed and alluding to the tornado’s force. R follows S; it refers to the tornado’s destructive force and concludes the paragraph with the disappearance of the tornado.

Paragraph 3 (TQSRU)

The given sentence says that the giant panda is an unusual bear species. T is next because it compares pandas with other bears that eat smaller animals, roots, and berries. Q follows T with “on the other hand,” contrasting the panda’s diet of bamboo shoots with the diet of other bears in T. S tells us that pandas also differ from other bears in their paw structure. R follows with its description of a panda paw, and U explains how that paw has adapted to its bamboo shoot diet.

Paragraph 4 (TSURQ)

The given sentence presents a challenge—is it possible to tie a knot in the middle of a rope while holding both ends? T is next with a promise to describe how to accomplish the knot tying. The first step is S, which states, “Begin by ...” U is next, as it instructs you to fold your arms completely. R describes how, with your arms folded, you grip one end of the rope, then unfold your arms. Q closes the procedure with the formation of a knot.

Paragraph 5 (SRUTQ)

The given sentence introduces the topic of songs from the American Revolutionary War. S is next, beginning with the phrase, “The first American patriotic ballad ...”, which provides an example of a song published before the Revolution began. R follows S, with its mention of “another American original” written during the Revolution and sung by American troops. U links to R with another song, “Yankee Doodle,” sung by the British, not the Americans. T is next—the song is “Yankee Doodle,” mentioned in U, and the statement that Americans “took it for their own” follows U’s statement that “Yankee Doodle” was originally a British song. Q ends the paragraph with an ironic twist that the Americans eventually played the song to surrendering British troops.

Logical Reasoning

11. (E) Most people find it helpful to draw a diagram for this kind of problem. Let an initial stand for each name. Write “tallest” on the left-hand side of your scrap paper. Then diagram the first statement.

Tallest: F L M

After reading the second statement, you can put Jodi into the diagram, but not Noah. All we know about Noah is that he goes somewhere to the left of Mickey; we don’t know how his height compares with that of Fernando or Lisa.

Tallest: F L M J

After reading the third statement, we are still not sure about Noah’s position. We know he is shorter than Fernando, but he could fit on either side of Lisa. Thus, Noah is either second or third, but his exact position “cannot be determined from the information given.”

12. (H) Draw a diagram to help solve this problem. Write “1st” on the left-hand side of your scrap paper, followed by five spaces.

1st \_\_\_\_\_

The question says that the last tree is an elm and the second tree is a maple. Fill in the blanks with that information.

1st \_\_\_\_\_ M \_\_\_\_\_ E

According to the third statement, the hickory is after the maple and before the aspen. The only possible order that meets this requirement is:

1st \_\_\_\_\_ M H A E

The aspen is in the fourth position.

13. (D) Statement one tells us that there are two cars—a convertible and a sedan. Make a diagram with two headings and list the characteristics that can be assigned to one car or the other.

	Convertible	Sedan
Statement 2	driven only on Sundays	
Statement 3	? ? ?	? ? ?
Statement 4		driven only on Mondays; a scratch on the door (assigned to the sedan because of Statement 2)
Statement 5	runs on diesel fuel (assigned to the convertible because of Statement 4)	

Because of the conclusion from statement five, we can deduce from statement three that the sedan does not run on diesel fuel. This eliminates Option A. Options B, C, and E do not agree with the list of characteristics either. The only true statement is D, that the convertible runs on diesel fuel.

14. (F) This question contains two conditional statements. It is important that you read each statement carefully. The first sentence may be restated as, “If Sarah goes to the party, then John will not go.” This is simply a rearrangement of the two clauses of the first condition and there is no change in meaning. Note that the sentence only tells us what will happen *if* Sarah goes to the party. *It says nothing about what will happen if Sarah does not go to the party.* Therefore, it is incorrect to conclude that John *will go* to the party if Sarah does not go. It is also incorrect to conclude that John *will not go* to the party if Sarah does not go. We simply do not know what will happen. Likewise, the second sentence can be restated as, “If Peter’s mother comes home in time, then Sarah will go.” However, it does not tell us what will happen if Peter’s mother does **not** come home in time.

Option F is correct; if Peter’s mother comes home in time, Sarah will go to the party and, if she goes, John will not go. Option G is wrong because the first condition does not say what will happen if John does not go to the party. Sarah may or may not go to the party, while John does not. The previous paragraph explains why Option H is wrong. Option J contradicts the first statement, and Option K can be ruled out because no information is given about Peter going to the party.

**15. and 16.** Read the directions carefully. The letters in a sentence may or may not appear in the same order as the words in that sentence. For example, in the first sentence the first letter (M) may or may not represent the first word (John). Remember that you need not find out what every letter represents in the code.

15. (D) “Manuel” appears only once in the code, in the third sentence. The second and third sentences are identical except for the names Sally and Manuel. Thus the letter that is unique in each sentence must represent the name. In sentence 3, the only letter that differs from the letters in sentence 2 is Z. So Z must represent Manuel.

16. (G) The letter X appears in the last three sentences, but not in the first sentence. The only word that appears in the last three sentences is “with,” so Option G is correct.

17. (E) Option A is a value judgment that is not supported by the information given. Option B refers to freshmen, who are not mentioned at all. Option C looks appealing because all seniors in the club are highly sophisticated, but club members who are not seniors might be even more sophisticated, so it is not a valid conclusion. While Option D might be true, there is no basis for concluding that “most” seniors in the club have a sense of humor. Option E is a valid conclusion. Some people, including the seniors in the club, have no sense of humor but are highly sophisticated nonetheless.

18. (K) This question requires you to solve two relationships: matching the horses with their owners and putting the horse-owner pairs in order. The four horses are bay, spotted, white, and chestnut. The four competitors are Anita, Pinh, Mia, and Juan. Start by matching the horses and their owners. List the horses and write down what is known about their owners:

Bay = Anita  
 Spotted ≠ Pinh  
 White = Mia  
 Chestnut = ?

Pinh does not own the spotted horse so he must own the chestnut horse. The spotted horse must belong to Juan.

Now place the horses’ owners in order, using the information above and the information given in the question. Mia is behind Juan (statement three) and Juan is directly behind Anita (statement four). According to statement five, Juan (the owner of the chestnut horse) is behind Anita (the owner of the bay horse).

Either of the following orders could be correct:

<i>First</i>	<i>First</i>
<i>Anita</i>	<i>Anita</i>
<i>Juan</i>	<i>Juan</i>
<i>Pinh</i>	<i>Mia</i>
<i>Mia</i>	<i>Pinh</i>
<i>Last</i>	<i>Last</i>

Based on the information given, it is not possible to determine who stood last in line, Mia or Pinh.

19. (C) The doctor described symptoms for type X flu (fever and headache) and type Y flu (headache, but no fever). This does not mean that there are only two types of illnesses. The directions say, “Base your answer only on the information given.” We **do not** know that type X and type Y flu are the only two types of illnesses because the information provided does not say so.

Option A is incorrect because the information given is not sufficient to conclude that Charlie must have type X flu. He could have another illness. B is wrong for similar reasons; Charlie’s symptoms could indicate another illness. D can be ruled out because a headache may be a symptom of many illnesses, including, but not limited to, flu. E is wrong because a person with type Y flu never has a fever. Option C is correct because it states that Charlie **may** have type X flu, leaving open the possibility of another illness.

20. (H) The question asks which option **must** be true. Options F, J, and K **might** be true, but there is not enough information given to conclude that any of them **must** be true. We cannot conclude that deserts are the driest places on earth (Option F), since the question provides no definite information about this, or whether deserts always have at least some rainfall each year (Option J). Option K can be ruled out because the information provided for the Sawli and Gobi deserts is average yearly rainfall, which allows some variation from year to year. Option G can be ruled out because no information is given about the amount of rainfall received by most deserts. Only Option H **must** be true. The question says that the Sawli Desert, with a yearly rainfall of 5 inches, is the wettest desert in the world. From this information we can conclude that all deserts must receive less than 6 inches each year.

## Reading

### (Sherlock Holmes)

21. (C) This question asks you to determine the general theme of the passage. Options A and E are true statements, but they are details that do not describe the entire passage. Option B refers to one aspect of “the game” and does not encompass the whole passage. Option D was very appealing to many readers. It is a true statement, according to line 31, but the complexity of the game is not the main idea of the passage. The main idea is the game itself. The best answer is Option C, “Some Sherlock Holmes scholars enjoy pretending that Sherlock Holmes was a real person.”

22. (J) The discovery of a new Sherlock Holmes story would be of great interest to readers, scholars, and game players, ruling out Options F and K. It would not likely reveal more about Conan Doyle (Option G). Only two of the 56 existing stories mention Watson’s bullet wound, so it seems unlikely that a new story would settle the issue, which is Option H. Option J states that game players

would integrate details from the new story into the game. Given the information about game players—their fervent interest and their desire to create consistency among the stories—it seems likely that they would wish to integrate the new story with the existing stories.

23. (D) This is a detail question, for which the answer is stated directly in the passage. According to lines 8-10, “the players assume that Holmes was a real person,” which is the correct answer, Option D. Option A is ruled out because the players do not create the characters. Frequent travel around England (Option B) is not necessary for playing the game, and readers need not understand Conan Doyle’s intentions (Option C) in order to play. Option E refers to an extreme example of an individual game player who attempted to identify every place mentioned in the stories (lines 42-45). Most game players do not do this, and a person need not do so in order to play the game.

24. (G) This is another detail question. An example of an inconsistency appears in the second paragraph. Watson was wounded in the shoulder or the leg, or both. The correct answer is Option G. Option F has no basis in the passage. Option H is mentioned, but the inconsistency refers to the handwriting, not to the story itself. Options J and K are about fictitious locations and events; they do not provide examples of inconsistencies.

25. (A) To answer this question correctly, you must understand the rules of the game: Holmes and Watson were real people; the settings, characters, and plots are factual; any apparent discrepancies can and must be explained; Watson wrote the stories; Conan Doyle merely published Watson’s manuscripts. Now evaluate each option for its consistency with the rules. Option A is not consistent with the game; game players assume that Watson wrote the stories, and it doesn’t matter to them whether Conan Doyle or his wife claimed authorship. Options B, C, D, and E are part of the game as described in the passage. Option E was especially strong for some test takers, but it is ruled out by lines 34 and 40-41.

26. (K) Some rules of the game are listed in the explanation to question 25. Evaluate each option for consistency with the rules. Option F is of little interest to game players, who believe that Watson, not Conan Doyle, wrote the stories. Game players assume that the stories and plots are factual and would not question Holmes’s solutions, ruling out Option G. Options H and J would not interest game players because they shed no light on the workings of the game. Option K, “figuring out where Watson lived,” is consistent with game players’ fascination with fleshing out the lives and activities of Holmes and the other characters.

### (Bedouins)

27. (E) While Option A might seem attractive, it does not specifically describe what the passage is about. “Rhythms,” or recurrence of related elements, are referred

to only in the first paragraph. No such recurring life elements appear again. Option B describes only one detail of the passage, as does Option D. Option C is not discussed at all. Option E is the best answer, since the passage describes Bedouin tribes in modern-day Saudi Arabia.

28. (G) The tribes' yearly migration begins in autumn (line 9), so Options F and J are incorrect. Options H and K are not related to the yearly migration. Since autumn follows summer (lines 13-16), Option G is correct.

29. (A) Modernizations (or new ways), as discussed in the last paragraph, are adopted only to "deal with the hardships of desert life" (lines 43-44). Option A restates that idea. Religious requirements for change are not mentioned, so Option B may be eliminated. Option C is incorrect since the length of the migration is controlled by the seasons. Option D is incorrect because pick-up trucks, used as an example of modernization, sometimes replace camels, the traditional method of transport. Option E contradicts the statement in lines 46-47.

30. (J) Options F, G, H, and K describe long-standing traits or traditions characteristic of the Bedouin's frugal and self-sufficient culture. However, in order to own pick-up trucks, the Bedouin would need money, which suggests that they have indeed shared some of Saudi Arabia's wealth.

31. (E) Options A through D each play an important role in the Bedouin's centuries-old lifestyle as described in the passage. The oil industry is recent, and though it has allowed the Bedouin to purchase pick-up trucks, it has had the least influence on their lifestyle.

32. (J) The story of the Bedouin elder (lines 32-38) supports the statement in the previous sentence (lines 30-32), which says that the Bedouin are extremely skilled in tracking. The correct answer, Option J, restates this sentence. Option H may seem correct since it mentions Bedouin elders. It can be ruled out, however, because the story refers to the relationship between the Bedouins and the police, not between the Bedouins and their elders. The remaining options mention other Bedouin characteristics, but they are not relevant to the story of the Bedouin elder.

### (Carnivorous Plants)

33. (A) You are asked to identify the general topic of the passage. Option C refers to only part of the passage. Options B and D are not mentioned at all. Option E, while true, is too general and is not the focus of the passage. Option A is best because the passage describes how carnivorous plants trap their prey to obtain nitrogen compounds.

34. (K) This question asks for a conclusion based on the factual information in the passage. Option F is incorrect, based on lines 12-16, which says that the plants also eat mice or frogs. The passage says nothing about the plants' life span compared to other green plants, ruling out

Option G. Option H is false; the first paragraph says that the plants can obtain nitrogen from decomposing organic matter. While the passage mentions Venus flytraps in North and South Carolina, it does not limit the habitats of carnivorous plants to the southern United States, thus ruling out Option J. Option K is correct, based on the first and second paragraphs, which discuss plants that live in wet, marshy areas, including carnivorous plants.

35. (A) The word "fast" has more than one meaning, so it is necessary to look at its usage in the passage to determine its meaning. The sentence reads: "Once an insect alights on a leaf, the nectar acts as flypaper, holding the insect fast ...." It is apparent from the context of the sentence that fast means "securely" or "firmly," so Option A is correct.

36. (G) The passage says that carnivorous plants use sticky liquid (sundew and butterwort), suction (bladderwort), hinged leaves (Venus flytrap), or a pool of water (pitcher plant), which rules out options F, H, J, and K. The passage states that carnivorous plants do **not** have a mouth or teeth (line 20). Thus Option G is correct.

37. (C) The answer is stated in lines 17-18: "Because they can digest living animals, these plants are called 'carnivorous' plants." Option C restates this definition.

38. (K) The last paragraph describes how the bladderwort captures its prey. The plant's bladders have trapdoors that open only inward (lines 64-65). When the trapdoor opens, water rushes in, the prey is sucked inside, and the trapdoor closes (lines 67-71). Option K accurately summarizes why the bladderwort's victim is unable to escape. Notice that the other options are not about the bladderwort, but describe the strategies of other carnivorous plants. If you did not read the question carefully, you might have chosen an option that sounded plausible, but did not relate to the bladderwort.

### (Sea Otters)

39. (A) Again you are to choose the option that best describes the general topic of this passage. Options B and C are important and interesting details, but they are too specific. Option E is too broad; sea otters and kelp forests are only part of the Pacific Coast ecology. The origin of kelp forests is not mentioned, so Option D can be eliminated. Option A best describes the passage. The sea otter's role in kelp forests is alluded to in the first and third paragraphs and described more fully in the fourth paragraph.

40. (H) Lines 24-26 list the few reasons that sea otters visit land. Option H best reflects one of the reasons, "to escape severe wind and waves" (lines 24-25). Options F, G, J, and K might seem reasonable, but they are not accurate, according to the passage.

41. (B) This question requires the reader to draw a logical conclusion based on the facts given. Option A is incorrect, since it refers to a human activity (commercial fishing). Option C describes a situation caused by sea urchins, not sea otters. Option D is not reasonable, since killer whales prey on sea otters, not vice versa. The nesting areas of bald eagles referred to in Option E are clearly beyond reach of any action of sea otters. However, Option B could occur if the number of sea otters increased and they consumed a greater number of shellfish.

42. (H) This question asks the reader to recognize a cause-and-effect relationship not explicitly stated in the passage. Option F is untrue because of lines 11-12. Option G may be true, but nothing in the passage suggests that such legal action was taken because of a decline in other forms of coastal marine life. The same is true for Option J. Option K is true, as many people do find sea otters cute and want to protect them. However, it is **not** the correct answer because there is absolutely no support for this in the passage. **You must keep this in mind. You may know that something is true from your knowledge or experience. However, unless it is supported by the information in the passage, it will not be the correct answer.** The sentence beginning on line 12 suggests that Option H is correct. Further, the statement that sea otters are thriving since the ban reinforces that inference.

43. (E) At first you may think you need to know about parasites, koala bears, or acid rain in order to answer this question. However, you are asked to identify a parallel situation—one that closely resembles the relationship between otters and sea urchins. The passage states that when otters were not there to eat the sea urchins, the sea urchin population grew and devastated the kelp forest. Now look at the relationships presented in the options. In Option A, removal of the parasites causes the death of the mammal, not growth. Option B is incorrect because it introduces the idea of pesticides, for which there is no counterpart in the passage. Option C does not describe the changes, favorable or unfavorable, caused by acid rain, so it may be eliminated. Option D would be parallel only if otters had disappeared because there were not enough sea urchins to eat. Option E describes a parallel situation: When the wolves disappeared, one of their food sources (deer) increased dramatically, which is precisely what happened to sea urchins when the otter population fell.

44. (K) Check each option against the information in the passage and rule out the options that **do** represent a threat to sea otters. Options F and G can be ruled out since water pollution and shoreline development are threats to kelp forests (lines 42-43), whose devastation represents a threat to sea otters. Option H is incorrect since fur hunters once reduced the sea otters' numbers to low levels (lines 11-17). Option J is wrong because

sharks are enemies of sea otters (line 28). Harbor seals, mentioned in lines 47-48, represent no threat to sea otters, so Option K is correct.

### (Montessori)

45. (C) Option B is too broad, while Options A, D, and E refer to details. Option C is best; the second and third paragraphs describe Maria Montessori, an important educator, and paragraphs 1 and 4-7 discuss Montessori's ideas about children and education.

46. (G) This is a detail question, for which the correct answer is stated directly in the passage. Lines 35-37 support Option G as the correct answer.

47. (D) This is another detail question. The correct answer, "young children in a poor neighborhood," is found in lines 61-63. Option A might look appealing, but it refers to a school founded in 1900, not 1907. Options B and C are not mentioned in the passage. While schools teaching the Montessori method to teachers do exist (Option E), they were founded well after 1907.

48. (J) Information about Montessori's childhood appears in the second paragraph: her parents' attitudes, her education at a technical school, and her reaction to teaching methods that emphasized formality and memorization. Options F and G are not supported by the passage. Option H is ruled out because Montessori trained as an engineer, then as a doctor, before she became a teacher. The passage suggests that the teaching methods used at the engineering school influenced Maria's ideas about education (lines 18-22), but does not suggest that her interest in the subject area of engineering influenced her career as an educator (Option K). Option J is the best answer. It links Montessori's early dissatisfaction with the teaching at the technical school to her subsequent career in childhood education.

49. (A) After listing objects found in many preschool classrooms, the passage continues, "All of these familiar objects reflect the deep influence of Maria Montessori and her theory of education" (lines 6-8). Option A best summarizes this statement. None of the other options relate to those objects.

50. (H) The only information about Maria's mother is found in the second paragraph: she encouraged her daughter to pursue broader schooling than most girls received, and she supported Maria's enrollment in a boys' technical school. Both statements relate to educational opportunities for girls, which is Option C. The other options can be ruled out because only Maria attended the technical school (Option F) and Maria's mother opposed, not supported, Maria's father's wishes (Option G). The passage says nothing about how Maria's mother viewed children's personality development (Option J) or strict classrooms (Option K).

51. (A) Remember that 20% is equivalent to 0.20, and 5% to 0.05. First solve for  $N$ :  
 $N = (0.05)(1,000) = 50$   
 Now you can solve for  $M$ :  
 $M = (0.20)N = (0.20)(50) = 10$

52. (F)  $\overline{XY}$  is 9 units long. One-third of 9 is 3. Since R is less than S, it is between X and S. Three units to the right of X is 2, so R will fall at 2.

53. (D) To obtain the decimal form of a fraction, divide the numerator by the denominator. The result is 0.3125.

54. (H)  $7^2 < 51 < 8^2$ .  
 So  $7^2 < n^2 < 8^2$ ,  
 and  $7 < n < 8$ .

55. (A) Note that the mean is not the average of the four numbers 20, 21, 25, 27. One must take the frequencies of these numbers into account. The correct mean is:

$$\frac{5 \cdot 20 + 3 \cdot 21 + 2 \cdot 25 + 2 \cdot 27}{5 + 3 + 2 + 2} =$$

$$\frac{100 + 63 + 50 + 54}{12} = 22.25$$

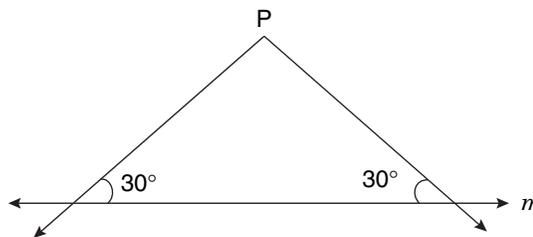
56. (G) Count back from 40. 39 is not a prime number because it is  $3 \times 13$ . 38 is not a prime because it is even. 37 is a prime.

To see that 37 is a prime, test whether it is divisible by whole numbers up to 7. There is no need to test for factors above 7 because if one factor of 37 is greater than 7, the other must be smaller than 7. Start with 2. 37 is not even, so it is not divisible by 2, and hence not by 4 or 6. The sum of the digits of 37 ( $3 + 7 = 10$ ) is not divisible by 3, so 37 is not divisible by 3. 37 does not end in 5 or 0, so it is not divisible by 5. It is not divisible by 7 because  $7 \times 5 = 35$  and  $7 \times 6 = 42$ . Thus 37 is prime.

57. (E) By the Distributive Rule,  
 $2x(3y + 1) = 2x \cdot 3y + 2x \cdot 1 = 6xy + 2x$

58. (H)  $\frac{27}{4} = 6\frac{3}{4}$ ; the **least** integer greater than  $6\frac{3}{4}$  is 7.

59. (C) One can draw exactly two lines from P to  $m$  satisfying the required condition:



60. (G) At 2:00 p.m., seven hours had passed since the initial temperature reading of  $-12^\circ$ . The temperature rose  $3^\circ$  each hour for a total rise of  $21^\circ$ .  $(-12)^\circ + 21^\circ = 9^\circ$ .

61. (B) From the graph, we see that the amount received from selling 10 tickets is \$250, 20 tickets is \$500, 30 tickets is \$750, etc. This shows that the amount received is directly proportional to the number of tickets sold. Therefore, the price of one ticket is \$25.

62. (G) Let  $x$  be the nonzero integer. Then:

$$(-1)x = x^2$$

We know that  $x$  is not zero. So we can divide both sides of the equation by  $x$ . This gives us:

$$-1 = x.$$

63. (B) From the figure, it is clear that the area of square HCEF is 64 sq cm. The diagonals intersect at the center of the square, and since  $\overline{DG}$  passes through this center, D is the midpoint of  $\overline{CE}$ . Therefore,  $DE = 4$  cm and the area of GDEF is 32 sq cm.

The area of the unshaded part of GDEF is  $\frac{1}{4}$  of the whole rectangle, so its area is 8 sq cm.

The area of the shaded region is

$$32 \text{ sq cm} - 8 \text{ sq cm} = 24 \text{ sq cm}.$$

64. (K) Move the constant  $-6$  to the left side of the inequality, resulting in the inequality  $10 + 6 < x$ , which is  $16 < x$ , or  $x > 16$ .

65. (C) First remove the parentheses, then combine like terms. Remember to change the signs for each term in the second parentheses, because of the minus sign in front:

$$(13 + 2x) - (4 - x) = 13 + 2x - 4 + x$$

$$= (13 - 4) + (2x + x)$$

$$= 9 + 3x$$

66. (F)  $90\%$  of 9 =  $0.9 \times 9 = 8.1$ .  
 $9\%$  of 90 =  $0.09 \times 90 = 8.1$ .  
 So the difference is 0.

67. (D) To find  $x$  and  $y$ , factor 27,783 into the product of powers of prime factors, which are known to be 3 and 7. First, keep dividing 27,783 by 3 until the quotient is not divisible by 3.  $27,783 = 3 \cdot 9,261$ . 9,261 is divisible by 3 because the sum of its digits is 18, a number divisible by 3. Divide 9,261 by 3 and obtain  $27,783 = 3 \cdot 3 \cdot 3,087$ . Continue this way and we obtain  $27,783 = 3 \cdot 3 \cdot 3 \cdot 1,029 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 343$ . 343 is not divisible by 3; the sum of its digits is 10. You should recognize that  $343 = 7^3$ . If you do not, divide by 7 to obtain  $7 \cdot 49 = 7 \cdot 7 \cdot 7$ . Hence  $27,783 = 3^4 \cdot 7^3$ , i.e.,  $x = 4$  and  $y = 3$ . Therefore,  $xy = 12$ .

68. (G) The slower train leaves point A at the same time the faster train leaves point B. When the trains meet, regardless of their speeds, the sum of their distances traveled since leaving points A and B will be 300 miles. First figure out how many hours ( $h$ ) will elapse before the trains meet. Set up the equation:

$$\begin{aligned} 30h + 70h &= 300 \\ 100h &= 300 \\ h &= 3 \end{aligned}$$

The trains will meet 3 hours after leaving points A and B. You can calculate their distance from point B by multiplying the speed of the train that left point B (70 miles per hour) by 3 hours to obtain 210 miles.

69. (D) There are 10 such rectangles. Nine are congruent to BCEN: MDFO, NEG H, ABNK, LMOJ, KNHI, ACDL, LDEK, KEFJ, and JFGI. ACGI is similar to BCEN, but it is not congruent to it. ACGI is similar to BCEN because its angles are equal to those of BCEN (all right angles), and each side of ACGI is twice as long as the corresponding side of BCEN.

70. (G) The sum of the two numbers is  $9 \times 2 = 18$ . One number is 5, so the other is 13. Therefore, their product is 65.

71. (C) You may assume that the fish caught were a random sample and represent the total number of fish in the pond. Of the 50 fish caught, 15, or 30 percent, were male. Therefore, 30 percent of 10,000, or 3,000, is the best estimate of the number of male fish.

72. (H) The area of a rectangle is length times width. The width ( $w$ ) is 5 feet and the area is 70 sq ft. Let  $l$  represent length:

$$\begin{aligned} 5l &= 70 \\ l &= 14 \end{aligned}$$

Now calculate the perimeter ( $p$ ) of the rug:

$$p = 2w + 2l = 2 \cdot 5 + 2 \cdot 14 = 10 + 28 = 38$$

73. (E) There are 4 ways to paint the inside of the box. After using one color for the inside, only 3 colors are left to paint the outside. Thus, there are altogether  $4 \cdot 3 = 12$  ways to paint the box.

74. (H) Substitute 3 for  $x$ :

$$\hat{\frac{1}{3}} = \frac{1}{3} \quad 3 \cdot \hat{\frac{1}{3}} = 3 \cdot \frac{1}{3} = 1$$

75. (A) Substitute  $x = 5.5$  and  $y = 4.5$  into the expression:

$$\begin{aligned} (x + y)(y - x) &= (5.5 + 4.5)(4.5 - 5.5) \\ &= 10(-1) \\ &= -10 \end{aligned}$$

76. (G) If Lindsey is now  $x$  years old and Xiu Dan is 2 years older, he is now  $x + 2$ . Therefore, 3 years ago his age was  $x + 2 - 3$ , or  $x - 1$ .

77. (E) Though the label is wrapped around a cylindrical soup can, it is a rectangle. The width is the height of the can, 4 inches. The length is the circumference  $C$  of the base of the can. The length can be calculated from the information given. With radius  $r$ , the circumference  $C$  is:

$$\begin{aligned} C &= 2\pi r \\ C &= 2\pi \left(1\frac{1}{2}\right) \\ C &= 3\pi \text{ in.} \end{aligned}$$

Now you can calculate the area of the label, with length  $L$  and width  $W$ :

$$\begin{aligned} \text{Area} &= L \times W \\ &= 3\pi \times 4 = 12\pi \text{ sq in.} \end{aligned}$$

78. (J) The prime factors for R and S are given in the problem. Their least common multiple is the product of these factors, each raised to the highest power with which it appears. Thus, the least common multiple for R and S is

$$3 \cdot 3 \cdot 5 \cdot 7 \cdot 7 \cdot 11.$$

79. (B) It is given that 1 in. is equivalent to 100 ft.

Squaring both sides,  $(1 \text{ in.})^2$  is equivalent to  $(100 \text{ ft.})^2$ , or 1 sq in. = 10,000 sq ft. Therefore, 1 sq ft is equivalent to  $\frac{1}{10,000}$  sq in., which is 0.0001 sq in.

80. (G) First, find out how much money remains after removing 7 dimes, 7 nickels, and 7 pennies.

$$\$1.22 - \$0.70 - \$0.35 - \$0.07 = \$0.10$$

Two coins remain after 21 have been removed. The only two coins that can make up 10 cents are two nickels.

81. (C) Knowing that  $x$ ,  $y$ , and  $z$  are consecutive multiples of 5, we can express the three numbers in terms of  $x$ :  $x$ ,  $x + 5$ , and  $x + 10$ . Or we can express them in terms of  $y$ :  $y - 5$ ,  $y$ ,  $y + 5$ ; or in terms of  $z$ :  $z - 10$ ,  $z - 5$ ,  $z$ . The problem asks for the sum of  $x$  and  $y$  in terms of  $z$ . Use the values representing  $x$  and  $y$  in the last set of expressions to obtain  $(z - 10) + (z - 5) = 2z - 15$ .

82. (H) Suppose the largest possible square has sides that are  $n$  inches long. Since there is no waste,  $n$  must be a factor of both 12 and 54. It has to be the largest number. So it must be the greatest common factor of 12 and 54, which is 6. (If you do not know how to find the greatest common factor, consult a textbook.)

83. (B) To solve this problem, you must know the formula for the volume  $V$  of a pyramid with base area  $b$  and height  $h$ . The volume and the height are given in the problem and can be inserted into the formula.

$$V = \frac{1}{3}bh$$

$$48 = \frac{1}{3}b(4)$$

$$144 = 4b$$

$$36 = b$$

The base is a square, so its area is the square of a side.

$$\sqrt{36} = 6 = \text{length of one side}$$

84. (H) To solve this problem, both numbers need to be like terms. First, convert the decimal 0.9 to a fraction:

$$0.9 = \frac{9}{10}$$

You can find the number halfway between two numbers by computing their mean (adding the numbers and dividing by 2). Therefore, the number halfway between  $\frac{4}{5}$  and  $\frac{9}{10}$  is

$$\frac{\frac{4}{5} + \frac{9}{10}}{2} = \frac{\frac{8}{10} + \frac{9}{10}}{2} = \frac{\frac{17}{10}}{2}$$

Simplify the result by multiplying the first fraction by the reciprocal of the second fraction:

$$\frac{\frac{17}{10}}{2} = \frac{17}{10} \div 2 = \frac{17}{10} \times \frac{1}{2} = \frac{17}{20}$$

85. (A) This problem asks you to express two inequalities and the relationship between them. The first inequality can be stated  $s \geq \frac{t}{2}$ . The second inequality is  $t > 0$ . Both inequalities contain the variable  $t$ . Note that if  $t > 0$ , then  $\frac{t}{2}$  must also be greater than 0. Thus the two inequalities may be combined as  $s \geq \frac{t}{2} > 0$ .

86. (J) Substitute the values into the expression.

$$\frac{x^y}{y^x} = \frac{2^3}{3^2} = \frac{8}{9}$$

87. (C) To find the median, put the numbers in order from least to greatest: 95, 106, 106, 106, 113, 117, 117, 127, 142. The middle number (the fifth one) is 113. (Notice that the mode is 106, which is Option B.)

88. (G) If Pei-Lin earned three times as much as Jaclyn, then Jaclyn earned \$80. If Latoya earned twice as much as Jaclyn, then Latoya earned \$160.

89. (B) Notice that  $\overline{MP}$  is the base of  $\triangle MNP$ , the altitude of which is given to be 8 cm. Therefore, if we know the area of  $\triangle MNP$ , we can calculate its base by the formula for finding the area of a triangle. (You should know that the area of a triangle is  $\frac{1}{2}$  base  $\times$  altitude.)

The area of  $\triangle MNP$  is exactly half of that of rectangle  $MNPQ$ , because the diagonal  $\overline{MP}$  divides the rectangle into two equal halves. The area of  $MNPQ$  is given to be 112 sq cm. Therefore, the area of  $\triangle MNP$  is 56 sq cm and we have:

$$\frac{1}{2} MP \times 8 \text{ cm} = 56 \text{ sq cm}$$

$$4 MP \text{ cm} = 56 \text{ sq cm}$$

$$MP = 14 \text{ cm}$$

90. (G) First find how many compartments will be filled by dividing 387 by 14. The answer is 27 full compartments with 9 people left to ride in the last compartment. (The total number of people the shuttle will hold is extraneous information.)

91. (D) Suppose R is at the number  $x$ . We know that  $x$  is between  $-2$  and 5.

$$PR = x - (-2) = x + 2$$

$$RQ = 5 - x$$

We also know that  $PR = 6 \cdot RQ$ . So:

$$x + 2 = 6(5 - x)$$

$$x + 2 = 30 - 6x$$

$$x + 6x = 30 - 2$$

$$7x = 28$$

$$x = 4$$

92. (J) Tamika now makes \$1,500 a year more than Joe. However, Joe will make \$300 more than Tamika in raises each year. Divide the difference in salaries, \$1,500, by the difference in the raises, \$300, to arrive at the point of equality:

$$\frac{1,500}{300} = 5 \text{ years.}$$

93. (A) Let the quotient be  $q$  when  $n$  is divided by 5.

$$\begin{aligned} n &= 5q + 2 \\ n + 4 &= 5q + 2 + 4 \\ &= 5q + 6 \\ &= 5q + 5 + 1 \\ &= 5(q + 1) + 1 \end{aligned}$$

From this we know that the remainder must be 1 when  $n + 4$  is divided by 5.

94. (H) The sum of the marbles is 24, 5 of which are black. After Ingrid removes 4 marbles, 20 marbles remain, 4 of which are black. Ingrid's probability of choosing a black marble next out of the remaining 20 marbles is  $\frac{4}{20} = \frac{1}{5}$ .

95. (A)  $\frac{n-6}{6-n} = -\frac{n-6}{n-6} > 0$

If  $n \neq 6$ , then  $n - 6 \neq 0$ , and we can cancel  $n - 6$  from the numerator and denominator of

$-\frac{n-6}{n-6}$  to obtain  $-1$ , which is less than 0.

Therefore, no number can satisfy this inequality. (We can cancel only non-zero factors in fractions. That is why we must assume that  $n \neq 6$ .)

96. (H) For any number  $n$  in the list, the next number is  $2n - 14$ . The list starts with number 13, so let  $n = 13$ . The second number is  $(2)(13) - 14$ , or 12. The third number is  $(2)(12) - 14 = 10$ . The fourth number is  $(2)(10) - 14 = 6$ .

97. (A) If one diagonal of the square lies on the  $y$ -axis, then two opposite corners are also on the  $y$ -axis. A third corner is given to be at the coordinates  $(3, 7)$ ; its opposite corner must be equally distant from the  $y$ -axis at coordinates  $(-3, 7)$ .

98. (H)  $\frac{2}{3}$  of a wall can be painted with 1 gallon of paint.

With  $\frac{3}{5}$  gallons, one can then paint  $\frac{3}{5}$  of the

amount that could be painted with 1 gallon, i.e.,

$$\frac{3}{5} \cdot \frac{2}{3} = \frac{2}{5} \text{ of the wall.}$$

99. (E) Let the number of laps that Ruby swam be  $x$ .

Then Katie swam  $\frac{3}{4}x$  laps.

Since Katie swam  $3\frac{1}{2}$  laps, we have:

$$\frac{3}{4}x = 3\frac{1}{2}$$

$$x = \frac{3\frac{1}{2}}{\frac{3}{4}} = \frac{7}{2} \cdot \frac{4}{3} = \frac{14}{3} = 4\frac{2}{3}$$

100. (J) The total of the 10 scores was 65 (the number of scores times the mean). If one score was dropped, 9 scores would remain. If the mean of these 9 scores was 6.0, their total was 54. The dropped score is the difference between 54 and 65, or 11.

### Answer Key for Sample Form B

Paragraph 1	11. E	21. C	31. E	41. B	51. A	61. B	71. C	81. C	91. D
Q R T U S	12. H	22. J	32. J	42. H	52. F	62. G	72. H	82. H	92. J
Paragraph 2	13. D	23. D	33. A	43. E	53. D	63. B	73. E	83. B	93. A
T U Q S R	14. F	24. G	34. K	44. K	54. H	64. K	74. H	84. H	94. H
Paragraph 3	15. D	25. A	35. A	45. C	55. A	65. C	75. A	85. A	95. A
T Q S R U	16. G	26. K	36. G	46. G	56. G	66. F	76. G	86. J	96. H
Paragraph 4	17. E	27. E	37. C	47. D	57. E	67. D	77. E	87. C	97. A
T S U R Q	18. K	28. G	38. K	48. J	58. H	68. G	78. J	88. G	98. H
Paragraph 5	19. C	29. A	39. A	49. A	59. C	69. D	79. B	89. B	99. E
S R U T Q	20. H	30. J	40. H	50. H	60. G	70. G	80. G	90. G	100. J

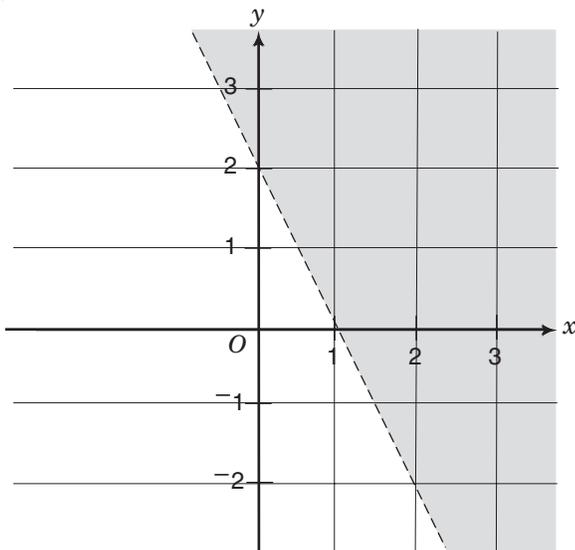
# Sample Mathematics Problems

## FOR GRADE 9

**DIRECTIONS:** This section provides sample mathematics problems for the Grade 9 test forms. These problems are based on material included in the New York City curriculum for Grade 8. (The Grade 8 problems on sample forms A and B cover mathematics material through Grade 7.) Directions on how to answer math questions are located on pages 46 and 82. There is no sample answer sheet for this section; mark your answers directly on this page or on a separate piece of paper.

1. In 1960, the number of tons of solid waste produced by a city was 75 million. In 1990, the number of tons was 180 million. By what percentage did the solid waste tonnage increase from 1960 to 1990?
- A. 70%
  - B. 75%
  - C. 105%
  - D. 140%
  - E. 240%

2.



Which inequality has the shaded region in the diagram above as its graph?

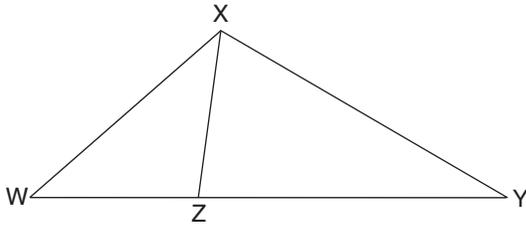
- F.  $y \leq -2x + 2$
- G.  $y < -2x + 2$
- H.  $y \geq -2x + 2$
- J.  $y > -2x + 2$
- K.  $y = -2x + 2$

3. Jessenia usually earns \$25 each week. Last week, she received an extra \$20 in bonus. What percent of her usual weekly income was her total income last week?
- A. 10%
  - B. 45%
  - C. 80%
  - D. 180%
  - E. 225%

4. Let  $M' = (12, 12)$  and  $N' = (24, 12)$ . If  $\overline{M'N'}$  is the dilated image of  $\overline{MN}$ , where  $M = (5, 5)$ , what are the coordinates of point N?
- F. (17, 7)
  - G. (10, 5)
  - H. (7.5, 5)
  - J. (0.2, 0.1)
  - K. (0.1, 0.2)

5.  $n$  is an integer smaller than  $-2$ . What is the range of possible values of  $\frac{1}{n^2}$ ?
- A.  $\frac{1}{n^2} < -4$
  - B.  $\frac{1}{n^2} > 4$
  - C.  $0 < \frac{1}{n^2} < \frac{1}{4}$
  - D.  $-\frac{1}{4} < \frac{1}{n^2} < 0$
  - E.  $-\frac{1}{2} < \frac{1}{n^2} < \frac{1}{2}$

6.



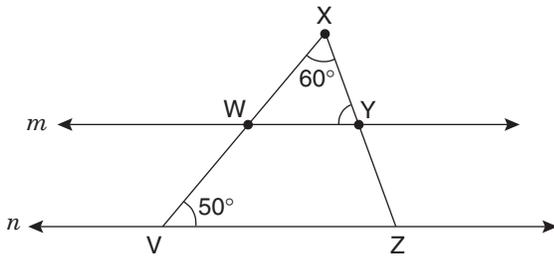
$\overline{WZY}$  is a straight line segment and  $\triangle XWZ$  is congruent to  $\triangle YXZ$ . What can one conclude about  $\angle XZW$ ? (The figure is not drawn to scale.)

- F.  $\angle XZW$  is a right angle.
- G.  $\angle XZW$  is larger than  $\angle XZY$ .
- H.  $\angle XZW$  is smaller than  $\angle XZY$ .
- J.  $\angle XZW$  has the same measure as  $\angle XYZ$ .
- K.  $\angle XZW$  has the same measure as  $\angle YXZ$ .

7. Simplify  $\frac{e^2 \cdot e^3}{e^6}$

- A. 1
- B.  $e^0$
- C.  $e^{-1}$
- D.  $e^{\frac{5}{6}}$
- E.  $e$

8.

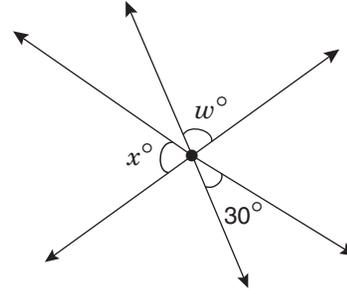


line  $m \parallel$  line  $n$

$\overline{VWX}$  is a straight line segment, and W and Y are points on line  $m$ . What is the measure of  $\angle XYW$ ?

- F.  $40^\circ$
- G.  $50^\circ$
- H.  $60^\circ$
- J.  $70^\circ$
- K.  $80^\circ$

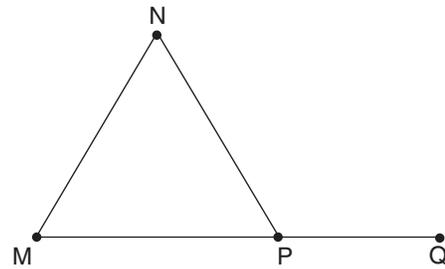
9.



In the figure above, three lines intersect at a point. What is the value of  $w$  in terms of  $x$ ?

- A.  $150 - x$
- B.  $165 - x$
- C.  $180 - x$
- D.  $150 - 2x$
- E.  $30 + x$

10.



In this figure,  $MN = NP = PM$  and  $\overline{MPQ}$  is a straight line segment. What is the measure of  $\angle NPQ$ ?

- F.  $60^\circ$
- G.  $90^\circ$
- H.  $100^\circ$
- J.  $120^\circ$
- K.  $150^\circ$

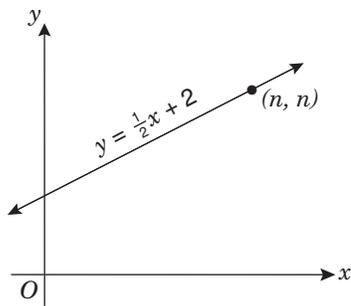
11. Let  $P = (2, 3)$ . First, translate  $P$  one unit to the right and call the image  $R$ . Next, reflect  $R$  over the  $y$ -axis and call the image  $S$ . Finally, rotate  $S$   $90^\circ$  clockwise about the origin and call the image  $T$ . What are the coordinates of  $T$ ?

- A.  $(-3, -3)$
- B.  $(-2, -3)$
- C.  $(-2, 3)$
- D.  $(3, -3)$
- E.  $(3, 3)$

12. The radius of circle  $C_1$  is  $R$ , and that of circle  $C_2$  is  $r$ . The area of  $C_1$  is twice that of  $C_2$ . What is  $R$  in terms of  $r$ ?

- F.  $\frac{1}{2}r$   
 G.  $\frac{1}{\sqrt{2}}r$   
 H.  $\sqrt{2}r$   
 J.  $2r$   
 K.  $4r$

13.



What is the value of  $n$  in the figure above?

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

14.

$$x^2 = P$$

$$x^2 \cdot x = Q$$

$$x^2 \div x = R$$

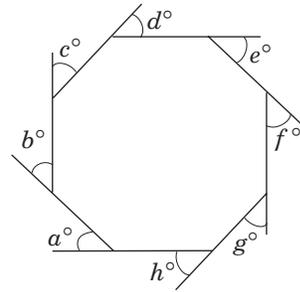
$$x^2 + x = S$$

$$x^2 - x = T$$

If  $x = -6$  in the equations above, which letter has the greatest value?

- F. P  
 G. Q  
 H. R  
 J. S  
 K. T

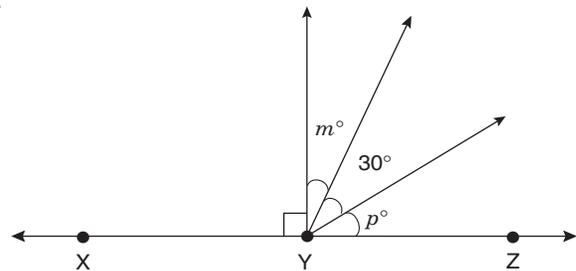
15.



The figure above is a regular octagon. What is the sum of the measures of the exterior angles ( $a + b + c + d + e + f + g + h$ )?

- A. 30  
 B. 45  
 C. 135  
 D. 360  
 E. 1,080

16.



In the figure above,  $Y$  is a point on line  $\overleftrightarrow{XZ}$ . What is the value of  $m + p$ ?

- F. 45  
 G. 60  
 H. 75  
 J. 90  
 K. 120

17. A jar contains exactly 6 balls: 5 red and 1 blue. If 5 balls are drawn from the jar at random and without replacement, what is the probability that they are all red?

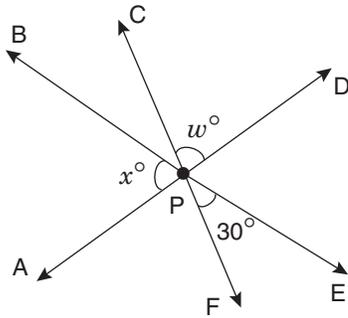
- A.  $\frac{1}{6}$   
 B.  $\frac{1}{5}$   
 C.  $\frac{5}{11}$   
 D.  $\frac{2}{3}$   
 E.  $\frac{5}{6}$

# Explanations of Correct Answers

## FOR GRADE 9 MATHEMATICS

1. (D) The base for the percentage is the weight for the first year, 75 million tons. The increase from the first year to the next year is 105 million tons.
- $$\frac{105 \text{ million}}{75 \text{ million}} = 1.4 \times 100\% = 140\%, \text{ which is}$$
- Option D.
2. (J) The equation whose graph is the dashed line is  $y = -2x + 2$ .
- Therefore, the region above the line is the graph of the inequality  $y > -2x + 2$ .
- The dashed line means that the line does not belong to the shaded region. So the shaded region is the graph of the inequality  $y > -2x + 2$  and not that of  $y \geq -2x + 2$ .
3. (D) Jessenia's total income for last week was  $\$25 + \$20 = \$45$ . Divide her income last week by her usual weekly income to determine the ratio between them and then multiply by 100 to obtain the percent.
- $$\frac{45}{25} \times 100\% = 1.8 \times 100\% = 180\%$$
4. (G) First, we need to find the scale factor  $d$  using M and M'.
- $$5d = 12$$
- $$d = \frac{12}{5}$$
- If N =  $(x, y)$ , and N' =  $(24, 12)$ , then:
- $$\frac{12}{5}x = 24$$
- $$x = 24 \left( \frac{5}{12} \right) = 10$$
- and  $\frac{12}{5}y = 12$
- $$y = 12 \left( \frac{5}{12} \right) = 5$$
- So, N =  $(10, 5)$ .
5. (C) Although  $n$  is a negative number, its square is positive. Therefore,  $n^2 > 4$ . From this, we obtain  $\frac{1}{n^2} < \frac{1}{4}$ . (Note that in taking reciprocals, the inequality is reversed.) In addition, we know that  $\frac{1}{n^2}$  is a positive number.
- So  $0 < \frac{1}{n^2} < \frac{1}{4}$  is the range of all possible values.
6. (F) Because triangles XWZ and YXZ are congruent, the corresponding angles WZX and XZY are equal. We know that  $\overline{WZY}$  is a straight line segment, so angles WZX and XZY are supplementary (the sum of their measures is  $180^\circ$ ). Because the angles are equal, the measure of each is equal to  $90^\circ$ . So Option F is correct and Options G and H are incorrect. Options J and K are not correct because angles XYZ and YXZ correspond to angles WXZ and XWZ, respectively. Because angle WZX is a right angle, angles XWZ and WXZ must each be smaller than angle WZX. So angle WZX cannot have the same measure as either angle XYZ or angle YXZ. Note that the diagram is deliberately not drawn to scale, so that the answer is not given away.
7. (C)  $\frac{e^2 \cdot e^3}{e^6} = \frac{e^5}{e^6} = e^{5-6} = e^{-1}$
8. (J) Because  $m$  and  $n$  are parallel lines, the two corresponding angles XWY and XVZ are equal. The measure of angle XWY is thus  $50^\circ$ . This means that the measure of angle XYW must be  $180^\circ - 60^\circ - 50^\circ = 70^\circ$ .

9. (A) Label the diagram as follows:



Note that  $\angle BPC = \angle EPF$ . Therefore, the measure of  $\angle BPC$  is  $30^\circ$ . Since  $APD$  is a straight line, the measures of  $\angle APB$ ,  $\angle BPC$ , and  $\angle CPD$  add up to  $180^\circ$ . Therefore:

$$\begin{aligned}x + 30 + w &= 180 \\x + w &= 180 - 30 = 150 \\w &= 150 - x\end{aligned}$$

10. (J) The sides of the triangle are equal in length, so the triangle is equilateral. The angles of an equilateral triangle are all equal to  $60^\circ$ .

$\overline{MPQ}$  is a straight line segment, so angle  $MPN$  and angle  $NPQ$  are supplementary. So the measure of angle  $NPQ$  is  $180^\circ - 60^\circ = 120^\circ$ .

11. (E) Translating  $P$  one unit to the right will increase the value of  $x$  by 1, so  $R = (3, 3)$ . Reflecting  $R$  over the  $y$ -axis will keep the value of  $y$  the same, but change the sign on the value of  $x$ , so  $S = (-3, 3)$ . Finally, rotating  $S$   $90^\circ$  clockwise about the origin will put the point back in the first quadrant and make  $T = (3, 3)$ .

12. (H) The area of  $C_1$  is  $\pi R^2$  and that of  $C_2$  is  $\pi r^2$ . We know that  $\pi R^2 = 2\pi r^2$ . Simplifying, we obtain  $R^2 = 2r^2$ . Taking the square root of each side, we obtain  $R = \sqrt{2}r$ .

13. (E) The point  $(n, n)$  is on the line and so must satisfy the equation. Substitute  $x = n$  and  $y = n$  and one obtains  $n = \frac{1}{2}n + 2$ , or  $\frac{1}{2}n = 2$ ; therefore,  $n = 4$ .

14. (K) We are given that  $x = -6$ , so we can immediately eliminate options Q and R. Q simplifies to  $x^3$ , which would result in a negative solution. Similarly, R simplifies to  $x$ , which would also result in a negative solution. Of the remaining options, the value of P would be between S and T, so we only need to evaluate S and T to find which is greater.

$$S = x^2 + x = (-6)^2 + (-6) = 36 - 6 = 30$$

$$T = x^2 - x = (-6)^2 - (-6) = 36 + 6 = 42$$

So, T has the greatest value.

15. (D) The sum of the interior angles of an octagon is  $(2 \cdot 8 - 4)$  right angles, that is,  $1,080^\circ$ . Because all eight interior angles are equal, the measure of each interior angle is  $1,080^\circ \div 8 = 135^\circ$ . Therefore, each exterior angle is  $180^\circ - 135^\circ = 45^\circ$ . The sum of all eight exterior angles is then  $8 \cdot 45^\circ = 360^\circ$ .

16. (G)  $\overleftrightarrow{XYZ}$  is a straight line. So

$$90 + m + 30 + p = 180$$

$$m + p + 120 = 180$$

$$m + p = 60.$$

17. (A) List all the possibilities of drawing 5 balls out of 6 without replacement. Let R stand for a red ball and B stand for a blue ball. There are only 6 possibilities: RRRRR, RRRRB, RRRBR, RRBRR, RBRRR, BRRRR. Therefore, the probability that the 5 balls drawn are all red is  $\frac{1}{6}$ .

### Answer Key for Grade 9 Mathematics

1. D	6. F	10. J	14. K
2. J	7. C	11. E	15. D
3. D	8. J	12. H	16. G
4. G	9. A	13. E	17. A
5. C			



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