ACCUPLACER®

North Carolina Community College System
Diagnostic and Placement Test Sample Questions

CollegeBoard

North Carolina Community College System (NCCCS) Diagnostic and Placement Test

Mathematics

The NCCCS Diagnostic and Placement Mathematics test* contains 72 questions that measure proficiency in six content areas. The six content areas are as follows:

Operations with Integers — Topics covered in this category include:

- Problem events that require the use of integers and integer operations
- Basic exponents, square roots and order of operations
- Perimeter and area of rectangles and triangles
- Angle facts and the Pythagorean Theorem

Fractions and Decimals — Topics covered in this category include:

- Relationships between fractions and decimals
- Problem events that result in the use of fractions and decimals to find a solution
- Operations with fractions and decimals
- Circumference and area of circles
- The concept of π
- Application problems involving decimals

Proportions, Ratios, Rates and Percentages — Topics covered in this category include:

- Conceptual application problems containing ratios, rates, proportions and percentages
- Applications using U.S. customary and metric units of measurement
- Geometry of similar triangles

Expressions, Linear Equations and Linear Inequalities — Topics covered in this category include:

- Graphical and algebraic representations of linear expressions, equations and inequalities
- Application problems using linear equations and inequalities

Graphs and Equations of Lines — Topics covered in this category include:

- Graphical and algebraic representations of lines

- Interpretation of basic graphs (line, bar, circle, etc.)

Polynomials and Quadratic Applications — Topics in this category include:

- Graphical and algebraic representations of quadratics
- Finding algebraic solutions to contextual quadratic applications
- Polynomial operations
- Factoring polynomials
- Applying factoring to solve polynomial equations

English and Reading

The NCCCS Diagnostic and Placement English and Reading test* is made up of three sections: Reading, Revising and Editing Writing, and WritePlacer®.

Reading — This section contains 30 questions. Topics covered in this section include:

- Main Idea/Summary
- Supporting Detail/Paraphrase
- Vocabulary
- Organization
- Inference
- Point of View, Fact-Opinion, and Bias (paired passages)
- Purpose/Tone
- Author's Use of Language

Revising and Editing Writing — This section contains 20 questions. Topics covered in this section include:

- Transitions
- Sentence Combining
- Revising Sentences, Inserting Sentences, and Deleting Sentences
- Topic Sentences, Thesis Statements, and Concluding Sentences
- Grammar, Mechanics, Sentence Structure, and Word Choice

*This guide will give you a sample of the type of questions that you may see on the NCCCS Diagnostic and Placement tests.

WritePlacer — This section measures your ability to write effectively, which is critical to academic success. The following six characteristics of writing will be considered:

- Purpose and Focus: The extent to which the writer presents information in a unified and coherent manner, clearly addressing the issue.

- Organization and Structure: The extent to which the writer orders and connects ideas.

- Development and Support: The extent to which the writer develops and supports ideas.

- Sentence Variety and Style: The extent to which the writer crafts sentences and paragraphs demonstrating control of vocabulary, voice, and structure.

- Mechanical Conventions: The extent to which the writer expresses ideas using standard English.

- Critical Thinking: The extent to which the writer communicates a point of view and demonstrates reasoned relationships among ideas.

Operations with Integers

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

1. On a summer day in Benton, the low temperature of 75°F was reached at 6 in the morning. The high temperature was reached 9 hours later, after the temperature rose 16°F. What was the high temperature in Benton that day?

   A. 81°F
   B. 84°F
   C. 91°F
   D. 96°F
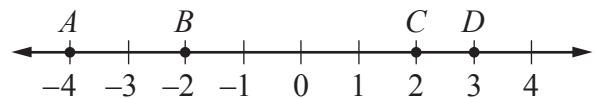
2. Which of the four labeled points on the number line above has the greatest absolute value?

   A. *A*
   B. *B*
   C. *C*
   D. *D*

3. $(-2 - 4) \times 8 =$

   A. −48
   B. −16
   C. 16
   D. 48

4. The sum of Cheryl's scores on the first four quizzes in her history class was 364 points. If she scores 96 points on her next quiz, what will be her average score for the five quizzes?

   A. 89 points
   B. 91 points
   C. 92 points
   D. 94 points

5. $\sqrt{529} =$

   A. 17
   B. 23
   C. 26
   D. 27

Fractions and Decimals

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

```
|------- 12 feet -------|
```
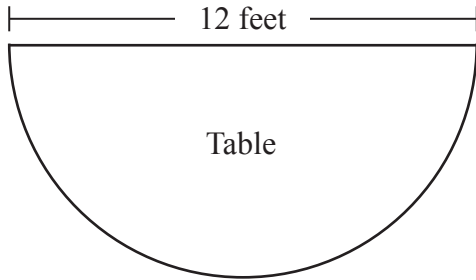

Table

1. A large dining room table is in the shape of a semicircle of diameter 12 feet, as shown above. Of the following, which is closest to the area of the table? (Use $\pi = 3.14$.)

   A. 38 square feet
   B. 57 square feet
   C. 75 square feet
   D. 113 square feet
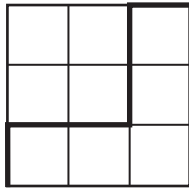
2. The large square above has area 9 and is divided into 9 smaller squares of equal area. What is the length of the path drawn in bold?

   A. 3
   B. 4
   C. 5
   D. 6

3. $0.6 \div 10^{-2} =$

   A. 60
   B. 6
   C. 0.06
   D. 0.006

4. $3,590 =$

   A. 3.59×10^5
   B. 3.59×10^4
   C. 3.59×10^3
   D. 3.59×10^2

75°
O
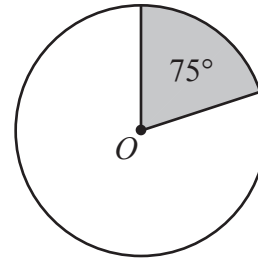
5. The circle above has center O. The fraction of the area of the circle that is shaded represents a value on the number line between

   A. $\dfrac{2}{25}$ and $\dfrac{3}{25}$
   B. $\dfrac{3}{25}$ and $\dfrac{4}{25}$
   C. $\dfrac{4}{25}$ and $\dfrac{5}{25}$
   D. $\dfrac{5}{25}$ and $\dfrac{6}{25}$

Proportions, Ratios, Rates and Percentages

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

1. During a basketball practice, two players, Sidell and Jeron, each attempted 25 free throws. Sidell made 40% of his free-throw attempts, whereas Jeron made 52% of them. How many more free-throws did Jeron make than Sidell?

   A. 3
   B. 4
   C. 5
   D. 6

2. A boy skis 4 miles down a mountain slope in 10 minutes. What is his average speed, in miles per hour (mph), over that time interval?

   A. 48 mph
   B. 36 mph
   C. 32 mph
   D. 24 mph

3. There are 23 children in a line to buy a hot dog. If every 4th child in line, starting with the fourth in line, gets a toy, what is the ratio of the number of children in line who get a toy to the number of children in line who do not get a toy?

   A. $3:8$
   B. $5:23$
   C. $5:18$
   D. $6:23$

4. 52 is what percent of 160?

   A. 30%
   B. 32.5%
   C. 35%
   D. 38.5%

5. Jenna is driving at a speed of 65 miles per hour. What is Jenna's driving speed in kilometers per hour? (There are about 1.6 kilometers in 1 mile.)

   A. 112 kilometers per hour
   B. 104 kilometers per hour
   C. 96 kilometers per hour
   D. 92 kilometers per hour

Expressions, Linear Equations and Linear Inequalities

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.
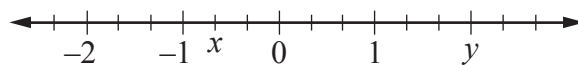
1. The tick marks on the number line above are equally spaced. The expression $y^2 + 2x$ is equal to

   A. $-\dfrac{8}{3}$

   B. 0

   C. $\dfrac{8}{3}$

   D. $\dfrac{16}{3}$

2. A party supply store charges an initial charge of $20 to rent a costume plus an additional $8 per day for each day the costume is rented. Which of the following represents the cost, in dollars, to rent a costume for n days?

   A. $8n$
   B. $20 + 8n$
   C. $(20)(8n)$
   D. $20 - 8n$

3. Julie purchased a treadmill that originally cost t dollars at a discount of 8%. Which of the following represents the amount, in dollars, that Julie paid for the treadmill after the discount?

   A. $t - 0.8t$
   B. $t + 0.08$
   C. $t + 0.08t$
   D. $t - 0.08t$

4. A long distance cell phone service offers a plan that costs $20 per month plus $0.40 per minute of use. Which of the following represents the total cost of this service for a month in which n minutes were used?

   A. $(20)(0.04n)$
   B. $20.40n$
   C. $20 + .4n$
   D. $20 + 4n$

5. If $\frac{x}{3} - 2 = 5x - 2$, then $x =$

A. $-\frac{3}{5}$

B. 0

C. $\frac{5}{3}$

D. 15

Graphs and Equations of Lines

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.
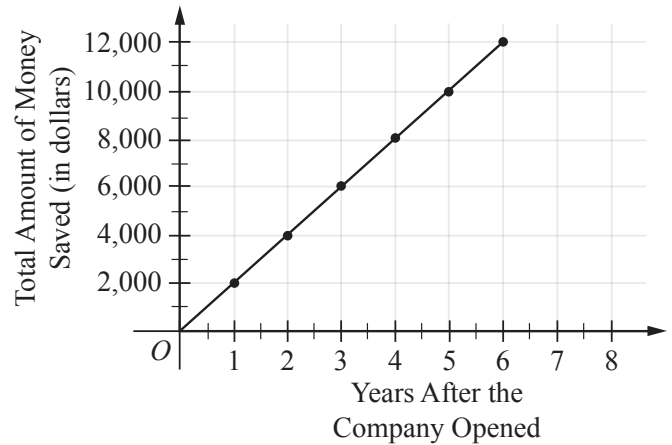

1. The linear equation graphed above gives the amount of money Company H has saved y years after the company opened. According to the graph, how many years after the company opened did they save $\$10,000$?

   A. 1
   B. 4
   C. 5
   D. 6

2. Anita's department store determined that if a specific shirt is priced at $\$50$ each, on average there would be 200 shirts sold each month the shirt is available for sale. The number of shirts sold per month would decrease by 10 for each $\$5$ of increase in the price. If p presents the price of the shirt, in dollars, and s represents the average number of shirts sold per month, which of the following graphs best represents the relationship between p and s?

   A.
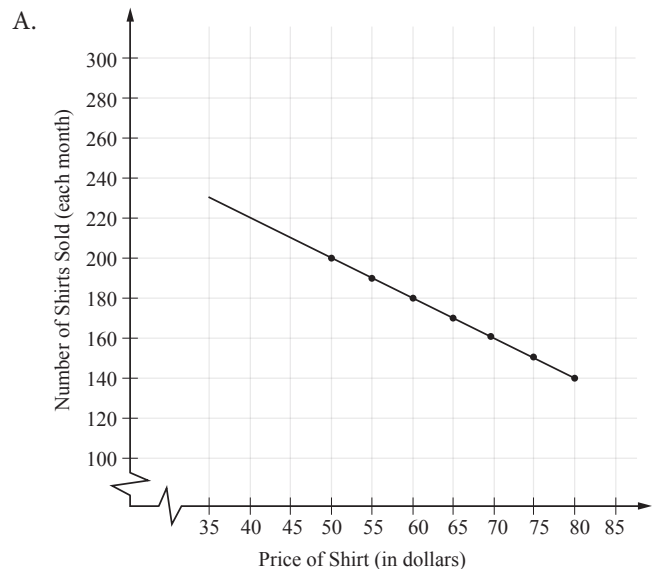
B.
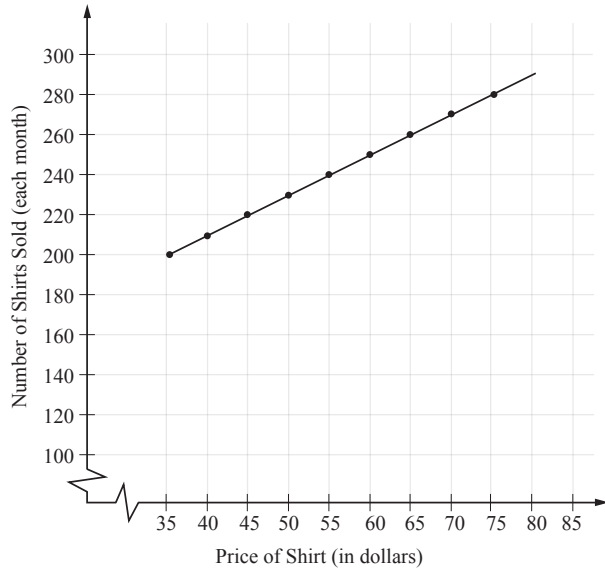
C.
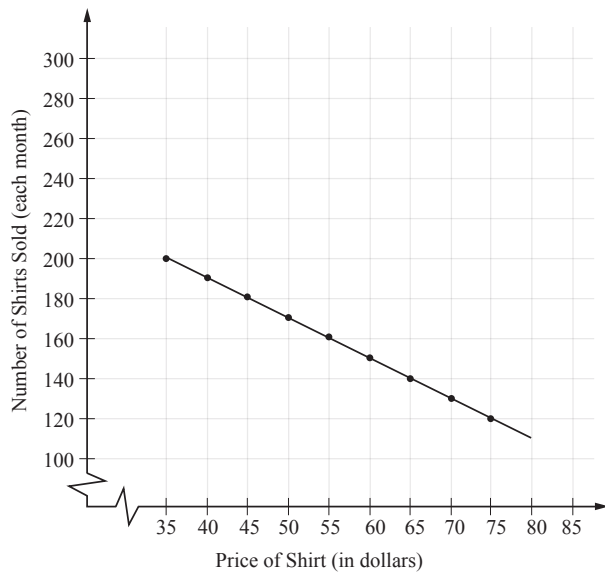
D.

3. A computer help-service charges an initial fee to join the service plus an additional charge for each hour of help-service a customer uses. If the computer se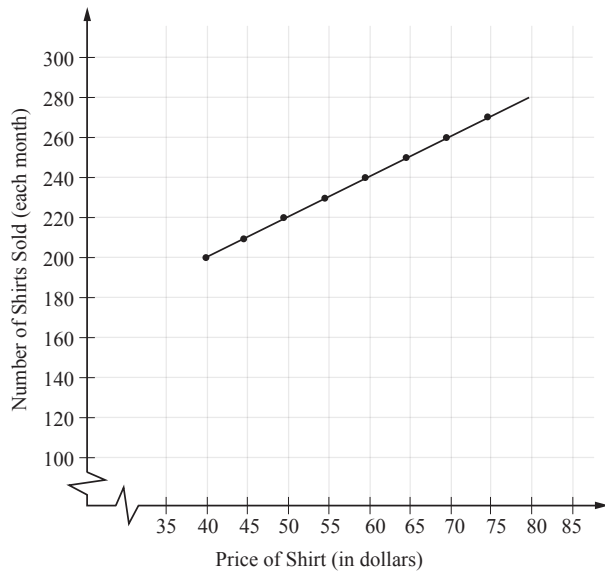rvice company charges a total of $140 for the initial fee and a 2-hour help session and a total of $220 for the initial fee and a 4-hour help session, which of the following expressions gives the computer company's charge for each hour of help-service that a customer uses?

A. $\dfrac{\$220 - \$140}{4 - 2}$

B. $\dfrac{\$220 + \$140}{4 + 2}$

C. $\dfrac{4 - 2}{\$220 - \$140}$

D. $\dfrac{4 + 2}{\$220 + \$140}$

4. Jen scored 16 points in a new card game, where each player could receive either 2 or 4 points in each round. If Jen received x amount of 2 point scores, and y amount of 4 point scores, what does the x-intercept of the graph in the xy-plane of the equation $2x + 4y = 16$ indicate?

A. Jen scored 2 points in 8 rounds and she didn't score 4 points in any round.

B. Jen scored 2 points in 2 rounds and 4 points in 3 rounds.

C. Jen scored 2 points in 4 rounds and 4 points in 2 rounds.

D. Jen didn't score 2 points in any round, but she scored 4 points in 4 rounds.

Polynomials and Quadratic Applications

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.
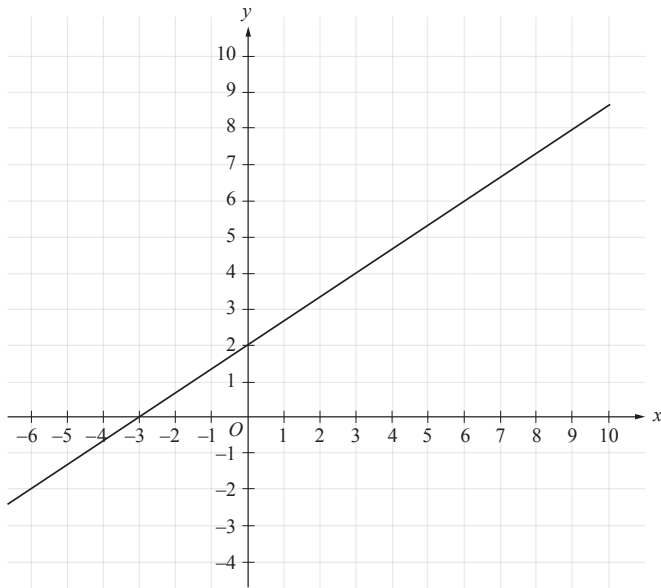
5. Which of the following is true about the line graphed in the *xy*-plane above?

   A. The line has slope $\frac{2}{3}$ and *y*-intercept -3.

   B. The line has slope $\frac{2}{3}$ and *y*-intercept 2.

   C. The line has slope $\frac{3}{2}$ and *y*-intercept -3.

   D. The line has slope $\frac{3}{2}$ and *y*-intercept 2.
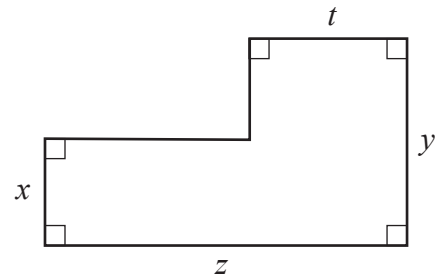
1. All of the line segments in the figure above meet at right angles, and the lengths of four of the six sides are given. Which of the following represents the area of the figure, in terms of x, t, y, and z?

   A. $yz - xt$

   B. $xz + ty$

   C. $xz - xt + ty$

   D. $xz + xt + ty$

2. $(xy^3z^4)(x^{-4}y^{-3}z^{-1}) =$

   A. $\dfrac{z}{x}$

   B. $\left(\dfrac{z}{x}\right)^3$

   C. $y\left(\dfrac{z}{x}\right)$

   D. $y\left(\dfrac{z}{x}\right)^3$

3. $\left(\dfrac{a}{2} - b\right)^2$

   A. $\dfrac{a^2}{2} - ab + b^2$

   B. $\dfrac{a^2}{2} - 2ab + b^2$

   C. $\dfrac{a^2}{4} - ab + b^2$

   D. $\dfrac{a^2}{4} - 2ab + b^2$

4. If $x^2 - 3x - 18 = 0$, which if the following is a possible value for of x ?

    A. -6

    B. 3

    C. 6

    D. 9

5. The function $f(x) = -x^2 + 40x - 175$ is graphed in the xy-plane above. For what value of x is the value of $f(x)$ greatest?

    A. 5

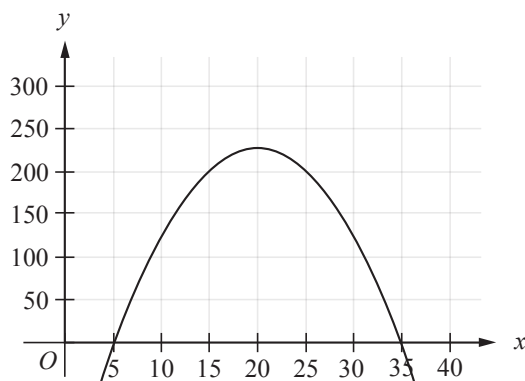   B. 20

    C. 30

    D. 35

6. $(x+9) \dfrac{1}{x^2 + 2x - 63} =$

    A. $x - 7$

    B. $x + 7$

    C. $\dfrac{1}{x-7}$

    D. $\dfrac{1}{x+7}$

Reading

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

1. Polyvinyl chloride, or PVC, is used in most water-carrying pipes in the United States. Known for their resistance to the corrosion that can be caused by water, PVC pipes are more durable than the metal pipes of old. As useful as PVC is, it may be surprising that it was accidentally discovered in 1835 by Henri Victor Regnault, who observed a mysterious white solid plastic forming inside some test tubes that were left exposed to sunlight in his lab.

   The main idea of the passage is that PVC, the material used in water pipes,

    A. is formed from a rare chemical compound

    B. was discovered by accident

    C. was Regnault's only major scientific discovery

    D. is less pliable than metal

2. Our bones grow continuously throughout our lives, with old bone cells dying and being discarded. However, for astronauts who are in space for a prolonged period, a lack of gravitational pull—which has a number of beneficial effects on the body, including supporting new bone growth—results in their bones adding less bone tissue to replace dying tissue. In fact, for every month in space, a person will lose 1.5 to 2% of his or her bone mass, with the hip bone and the lower leg bones most affected.

   The human body adds bone mass in order to

    A. replace dead bone tissue

    B. make up for a lack of exercise

    C. relieve stress on non-weight-bearing bones

    D. keep bone tissue from being discarded

3. Long thought to be a case of mistaken identity, the discovery of the Bornean rainbow toad by European explorers in 1924 was recently verified by scientists. The explorers had made a black-and-white sketch of an unusual toad they had found in the jungles of Southeast Asia, christening it the Bornean rainbow toad. Skeptical but curious, scientists recently went to look for the toad—and ended up finding three specimens.

   In the first sentence, "verified" most nearly means

    A. revealed

    B. confirmed

    C. controlled

    D. documented

4. The 1922 German Expressionist film *Nosferatu*, directed by F. W. Murnau, is considered one of the most influential films in cinematic history—while also being a classic vampire movie. The film is closely based on Bram Stoker's 1897 novel, *Dracula*; however, the villain in the film is called "Count Orlok" rather than "Count Dracula." The reason is that the small studio that produced the film, Prana Film, was unable to secure the rights to Stoker's novel. In fact, shortly after finishing *Nosferatu*, its one and only film, Prana went bankrupt in order to dodge copyright lawsuits from Stoker's widow.

Why does the author say that the vampire in *Nosferatu* is named "Count Orlok" and not "Count Dracula"?
   A. To show that the makers of *Nosferatu* made minor changes to Stoker's story
   B. To suggest that the characters in *Nosferatu* were based on real people instead of literary characters
   C. To criticize *Nosferatu* for its differences from its source
   D. To praise the makers of *Nosferatu* for their imagination in recreating Stoker's novel

5. In 2008, members of the "Public Space Movement," a worldwide effort to foster community enjoyment of public spaces, planned a day of "public pillow fights." These pillow fights were organized to occur worldwide, in civic centers, town squares, playgrounds, and other public spaces. New York City's 2008 pillow fight was the largest that year, with over 5,000 participants. The tradition has continued, and on April 2, 2011, citizens of more than 130 cities and towns around the world participated in what is now known as International Pillow Fight Day.

The passage suggests that the main goal of the pillow fights was to encourage people to
   A. spend more time outdoors
   B. engage in safe recreation activities
   C. make greater use of public areas
   D. get to know their neighbors

6. Swarms of locusts causing deadly plagues are usually thought of as the stuff of myths. However, the desert locust *Schistocerca gregaria* has been responsible for damage to populations across three continents. The desert locust does its damage by consuming its body weight in food each day, devouring virtually any type of vegetation it encounters. When millions of locusts swarm into an area, their effect on the food supply in that area and surrounding areas can be catastrophic. Fortunately, it takes a big, sustained rainstorm (a rare event in desert areas) to create the conditions in which desert locusts thrive.

The passage implies that the *Schistocerca gregaria* does its greatest damage by

   A. destroying property and infrastructure
   B. spreading dangerous diseases
   C. directly attacking other insects
   D. consuming other species' food supplies

7. Plywood, while not the most pleasing wood to look at, has become an incredibly important building material in house construction. It is flexible, inexpensive, and strong. Its strength is due to layers of thin wood glued on top of each other with the grain of each layer making a right angle with the grain of the layer below it. This way of layering the sheets of wood makes plywood difficult to break.

Which word best describes the author's attitude toward plywood's qualities?
   A. Ecstatic
   B. Surprised
   C. Impressed
   D. Dismissive

8. The first known dentures, worn as early as 700 BCE by the Etruscans of central Italy, were composed mainly of animal teeth held together by gold bands. Later, in the 16th century, a denture made of wooden teeth held in place by suctions became popular in Japan. A "natural" look emerged with the dentures of the 18th and 19th centuries, which featured teeth made of ivory or porcelain and mounted on plates of gold or vulcanite, a type of rubber. While some modern dentures still feature porcelain teeth, most dentures today contain teeth made from plastic and mounted on a metal base.

The author uses the term "natural" to indicate that the dentures of the 18th and 19th centuries
   A. resembled real human teeth
   B. included some real human teeth
   C. contained animal teeth rather than artificial substances
   D. were made of materials found in nature

9. **Passage 1**

I recently met a fifth-grade teacher who had asked her students what they did after school. Most said they stayed inside and watched TV or spent time on the computer. Some went to a recreation center for an afterschool program—where they played computer games. A handful of students played outside, but most of those were doing organized sports. It turned out that fewer than 10% of the children were enjoying unstructured time outside rather than concentrating on electronic devices. This is a tragedy! Now more than ever, kids need opportunities to learn and develop through outdoor activities—and not just on organized teams. Parents, limit computer use and encourage your kids to get outside and play every day!

Passage 2

There is almost no reliable data about the level of technological literacy among children in the United States. Our students perform relatively poorly on international tests in science and math, however, and many other Western countries teach more about technology than we do. It seems that American students are not as technologically literate as their international counterparts. This could put them at a disadvantage when it comes to their careers, because technology is everywhere, from medical facilities to farms. Obviously, it is imperative that teachers and parents make the use of technology, including computers, a more central part of children's lives.

The author of Passage 1 would most likely criticize the author of Passage 2 for

   A. overemphasizing the strength of the data about students' technological literacy
   B. overlooking the drawbacks of increasing the time children spend using technology
   C. dismissing as unimportant the development that occurs during outdoor activities
   D. exaggerating the proportion of careers that require knowledge of science and math

10. **Passage 1**

As computer programs and online services continue to advance, paperless offices are growing in popularity. Going paperless is certainly a more environmentally friendly option than using reams of paper. A paperless office may also save on various overhead expenses. However, it may be expensive in the long run to go paperless, depending on the size and needs of your company. Another option might be using less paper instead of attempting a completely paperless office. This way, your company can enjoy some advantages of a paperless system while avoiding some of the disadvantages.

Passage 2

Many companies today are choosing not to go paperless because of the high costs of doing so. Despite the "green" advantages, going paperless requires companies to maintain up-to-date hardware and software, and upgrades often come at a steep cost. Businesses may need to hire an IT person to monitor their systems, train new users and perform regular backups of information. Ensuring online security is also vital, and the more people a company has using a system, the closer the system must be monitored for privacy issues and viruses. It takes a lot of time and money to go paperless, and for many small businesses, it's just not worth the expense.

The author of Passage 1 would most likely criticize the author of Passage 2 for

   A. overemphasizing the significance of a company's size
   B. overlooking the environmental benefits of going paperless
   C. failing to consider an alternative to eliminating all paper
   D. underestimating the consequences of technological issues

Revising and Editing Writing

Directions for questions 1-4

Read the following early draft of an essay and then choose the best answer to the question or the best completion of the statement.

(1) There is a new fitness fad in California that provides exercise for dogs and fun for their owners. (2) The sport, called urban mushing, is similar to traditional dogsledding, only without the sleds or the miles of bleak, rural, frozen terrain. (3) Urban mushing is an activity for city residents.

(4) For over one thousand years, dog-powered sleds have been used for hunting and travel by indigenous peoples across the northern reaches of Siberia and North America. (5) Interestingly, the people known as Eskimos in the U.S. are called Inuit in Canada. (6) However, it was not until the Alaska Gold Rush in the late 1800s that dogsledding, or mushing, became known as a sport. (7) Before long, dogsled races were popping up throughout Alaska and the Northwest. (8) Dogsled racing involves being pulled various distances on a sled by a single dog or a team of dogs. (9) The increasingly popular pastime was even a demonstration sport at the 1932 and 1952 Olympics.

(10) Over the years, dogsled races spread across North America, northern Europe, and beyond. (11) As participation in the races grew, they sought out a way to keep the dogs in shape during warmer seasons. (12) Thus urban mushing was born. (13) Started in Seattle and now practiced all over the West Coast, the new sport involves harnessing dogs to bicycles, scooters, or carts instead of sleds. (14) Dogs seem to love the exercise and their mushers enjoy an exciting ride through city parks, on bike paths and even on neighborhood streets. (15) As the trend catches on, can it be long before we start measuring vehicle performance in dogpower instead of horsepower?

1. In context, which of the following is best to insert at the beginning of sentence 3 (reproduced below)?

   Urban mushing is an activity for city residents.

      A. Despite this,
      B. For all these reasons,
      C. As the name indicates,
      D. Yet in an unexpected way,

2. In context, where would the following sentence best be placed?

   The American Dog Derby, for example, was started in Ashton, Idaho, in 1917 and is still held today.

      A. Immediately after sentence 4
      B. Immediately after sentence 6
      C. Immediately after sentence 7
      D. Immediately after sentence 12

3. In sentence 11 (reproduced below), which of the following best replaces "they"?

As participation in the races grew, they sought out a way to keep the dogs in shape during warmer seasons.

   A. Eskimos
   B. Olympic athletes
   C. Californians
   D. dogsled racers

4. Which of the following sentences contains irrelevant information and should be deleted from the passage?

   A. Sentence 2
   B. Sentence 5
   C. Sentence 12
   D. Sentence 13

Directions for questions 5-8

Read the following early draft of an essay and then choose the best answer to the question or the best completion of the statement.

(1) Beginning with his 1964 film *A Fistful of Dollars*, the Italian director Sergio Leone resurrected the western, the most American of all movie genres, with a handful of austerely beautiful, hyperviolent, and stylized films known as "spaghetti westerns." (2) But the spotlight on one director has tended to obscure the rest of the Italian western subgenre, which may include as many as 500 films.

(3) Most of these pictures were all-Italian, quickly shot in studios just outside Rome. (4) Their settings, however, include Texas, New Mexico, and Arizona, as well as Mexico. (5) Multiple films were made simultaneously about characters with sometimes improbable names: Django, Cjamango, Sartana, Sabata, Arizona Colt. (6) Some were bigger-scale affairs, with international casts, exteriors in Spain, and money from German and — eventually — American studios. (7) Higher-end spaghetti westerns often featured extraordinary music (usually composed by Ennio Morricone), extravagant production design, and leading players from the United States, including Henry Fonda, Charles Bronson, Joseph Cotten, and Orson Welles.

8) Leone deserves the attention he received: he was a great filmmaker who made Clint Eastwood an international star. (9) *A Fistful of Dollars*, which was based on Japanese director Akira Kurosawa's samurai classic *Yojimbo*, was set in Mexico and shot principally in Spain, with the interiors staged in Rome. (10) Leone hired his star, who was on hiatus from the television show *Rawhide*. (11) Eastwood played a sullen gunslinger embroiled in a rivalry between two ruthless families in a dusty frontier town. (12) Eastwood later cemented his fame by playing the iconic police detective "Dirty Harry" Callahan.

5. In context, where would the following sentence best be placed?

When film critics and historians refer to the spaghetti western, they tend to mean four Leone films: his "Dollars" trilogy with Clint Eastwood and his epic, Once Upon a Time in the West.

   A. Immediately after sentence 1
   B. Immediately after sentence 2
   C. Immediately after sentence 6
   D. Immediately after sentence 7

6. In context, which of the following is best inserted at the beginning of sentence 8 (reproduced below)?

Leone deserves the attention he received: he was a great filmmaker who made Clint Eastwood an international star.

   A. Besides,
   B. Indeed,
   C. Regardless,
   D. Moreover,

7. In context, which of the following is the best way to revise and combine sentences 10 and 11 (reproduced below) at the underlined words?

Leone hired his star, who was on hiatus from the television show <u>Rawhide. *Eastwood played a sullen gunslinger*</u> *embroiled in a rivalry between two ruthless families in a dusty frontier town.*

   A. *Rawhide*, to play a sullen gunslinger
   B. *Rawhide*; Eastwood played a sullen gunslinger
   C. *Rawhide*, and he played a sullen gunslinger
   D. *Rawhide*, where he played a sullen gunslinger

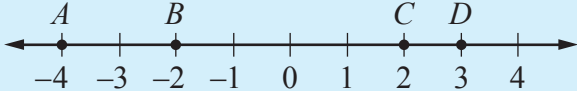8. Which sentence contains irrelevant information and should be deleted from the passage?

   A. Sentence 2
   B. Sentence 7
   C. Sentence 9
   D. Sentence 12

WritePlacer Sample Topic

Prepare a multiple-paragraph writing sample of about 300–600 words on the topic below. You should use the time available to plan, write, review and edit what you have written. Read the assignment carefully before you begin to write.

Some schools require each student to participate in an organized school sport chosen by the student. People at these schools argue that athletics is an important part of the educational experience and that there should be a rule requiring participation. Others argue that students should be free to decide whether or not they wish to participate in organized school sports. Write an essay for a classroom instructor in which you take a position on whether participation in organized school athletics should be required. Be sure to defend your position with logical arguments and appropriate examples. Your essay must be

300–600 words in length

Answer Key

<table>
<tr><th colspan="3">Operations with Integers</th></tr>
<tr><th>Question Number</th><th>Correct Answer</th><th>Rationale</th></tr>
<tr>
<td>1</td>
<td>C</td>
<td>Choice (C) is correct. The low temperature of $75°F$ was reached at 6 in the morning, and the high temperature was $16°F$ higher. So the high temperature in Benton that day was $75°F + 16°F = 91°F$.</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>

Choice (A) is correct. The absolute value of point A is $|-4| = 4$. The absolute values of points B, C and D, respectively, are $|-2| = 2$, $|2| = 2$ and $|3| = 3$. Therefore, of the four labeled points, point A has the greatest absolute value.</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>Choice (A) is correct. The value of $-2-4$ is $-2+(-4) = -6$. Therefore, $(-2-4) \times 8 = -6 \times 8 = -48$.</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>Choice (C) is correct. Cheryl's average score for the five quizzes will be the sum of the scores divided by 5, the number of quizzes. She scored a total of 364 points on the first four quizzes, and if she scores 96 points on her next quiz, the sum of the scores will be $364 + 96 = 460$ points. Therefore, her average score for the five quizzes will be $460 \div 5 = 92$ points.</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>Choice (B) is correct. The square root of 529, denoted $\sqrt{529}$, is 23, because $23^2 = 23 \times 23 = 529$.</td>
</tr>
</table>

Answer Key

<table>
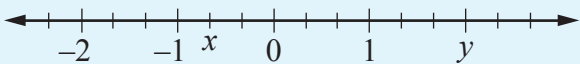<tr><td colspan="3" align="center">Fractions and Decimals</td></tr>
<tr>
<th>Question Number</th>
<th>Correct Answer</th>
<th>Rationale</th>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>Choice (B) is correct. Since the table is a semicircle of diameter 12 feet, the radius of the semicircle is 6 feet. The area of the table is $\frac{1}{2} \times \pi \times 6^2$ square feet, or approximately $18 \times 3.14 = 56.52$ square feet. Therefore, of the choices given, the closest to the area of the table is choice (B), 57 square feet.</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
<td>Choice (D) is correct. Since the large square has area 9, each of its sides is of length 3. Hence each of the 9 smaller squares has sides of length 1. Since the path drawn in bold is made up of six of the sides of smaller squares, its length is $6 \times 1 = 6$.</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>Choice (A) is correct. The division $0.6 \div 10^{-2}$ is equivalent to the multiplication $0.6 \times \frac{1}{10^{-2}} = 0.6 \times 10^2 = 0.6 \times 100 = 60$.</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>Choice (C) is correct. The number 3,590 is equal to the product $3.59 \times 1,000$, which can be rewritten as 3.59×10^3.</td>
</tr>
<tr>
<td>5</td>
<td>D</td>
<td>Choice (D) is correct. Since a circle has 360 degrees of arc, the shaded 75-degree sector of the circle represents $\frac{75}{360} = \frac{5}{24}$ of the circle, which is equal to the decimal $0.208\overline{3}$. This value lies between $\frac{5}{25} = 0.20$ and $\frac{6}{25} = 0.24$ on the number line.</td>
</tr>
</table>

Answer Key

<table>
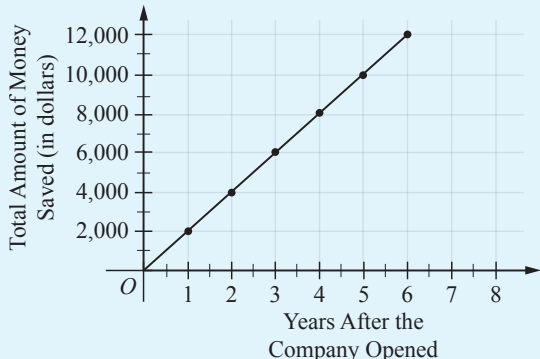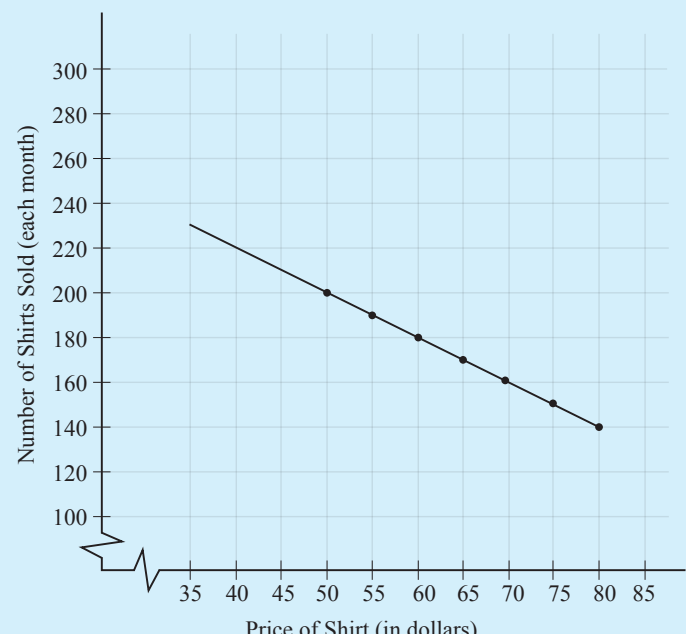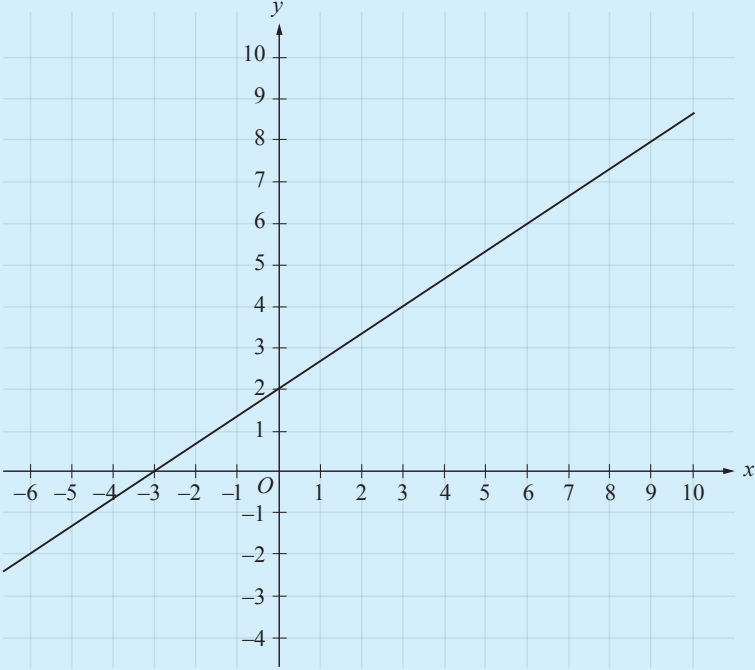<tr><td colspan="3">Proportions, Ratios, Rates and Percentages</td></tr>
<tr><th>Question Number</th><th>Correct Answer</th><th>Rationale</th></tr>
<tr>
<td>1</td>
<td>A</td>
<td>Choice (A) is cworrect. Since 40% of 25 is $\frac{40}{100} \times 25 = 10$, and 52% of 25 is $\frac{52}{100} \times 25 = 13$, Jeron made 3 more free-throws attempts than Sidell did.</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
<td>Choice (D) is correct. Since there 60 minutes in an hour, the 10-minute interval is equivalent to $\frac{1}{6}$ of an hour. The boy's average speed can be calculated as $\frac{\text{number of miles skied}}{\text{time}}$, which is $\frac{4}{\frac{1}{6}} = 4 \times \frac{6}{1} = 24$ miles per hour.</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>Choice (C) is correct. Since every 4th child in line, starting with the fourth in line, gets a toy, it follows that the children who get a toy are in line in positions 4, 8, 12, 16 and 20. Hence, of the 23 children in the line, 5 get a toy, and $23 - 5 = 18$ do not get a toy. Therefore, the ratio of the number of children in line who get a toy to the number of children in line who do not get a toy is $5 : 18$.</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>Choice (B) is correct. Since $\frac{52}{160} = \frac{13}{40} = 0.325$, it follows that 52 is 32.5 percent of 160.</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>Choice (B) is correct. Since there are about 1.6 kilometers in 1 mile, it follows that Jenna's speed in kilometers per hour is $65 \times 1.6 = 104$ kilometers per hour.</td>
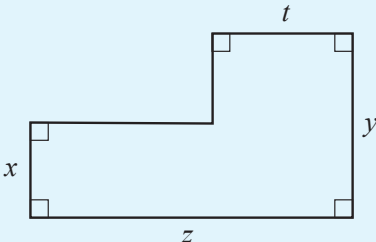</tr>
</table>

Answer Key

Expressions, Linear Equations and Linear Inequalities

Question Number	Correct Answer	Rationale
1	C	Choice (C) is correct. The value of x on the number line is $-\dfrac{2}{3}$, and the value of y on the number line is 2. Substituting these values into the expression $y^2 + 2x$ gives $2^2 + 2\left(-\dfrac{2}{3}\right) = 4 - \dfrac{4}{3} = \dfrac{8}{3}$.
2	B	Choice (B) is correct. The rental fee for the costume consists of the initial charge of $20 and a daily charge of $8. Thus if the costume is rented for n days, the total cost, in dollars, is $20 + 8n$.
3	D	Choice (D) is correct. If the original cost of the treadmill is t dollars, an 8% discount on that price is $0.08t$ dollars. Therefore, the discounted price is the original price, in dollars, minus the discount, which is $t - 0.08t$.
4	C	Choice (C) is correct. The cost, in dollars, of n minutes of use is $0.4n$. Therefore, the total cost of this service, in dollars, for a month in which n minutes were used is $20 + 0.4n$.
5	B	Choice (B) is correct. The equation $\dfrac{x}{3} - 2 = 5x - 2$ is equivalent to $\dfrac{x}{3} = 5x$. Multiplying both sides of this equation by 3 gives $15x = x$. It follows that $14x = 0$, so $x = 0$.

Answer Key

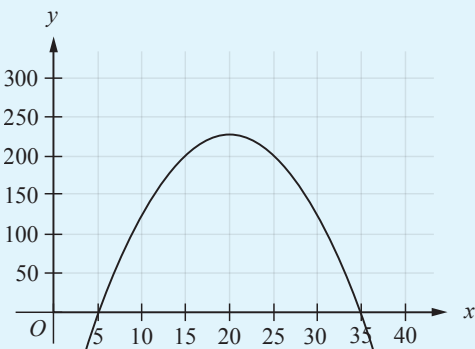## Graphs and Equations of Lines

Question Number	Correct Answer	Rationale
1	C	Choice (C) is correct. The *y*-value represents the total amount of money that the company saved. From the graph, after 5 years the company was opened, they saved $10,000.
2	A	Choice (A) is correct. The graph in (A) is a line with a slope of −10 that contains the point (50, 200).
3	A	Choice (A) is correct. The expression $\dfrac{\$220 - \$140}{4 - 2}$ represents the difference of dollars charged for two different help sessions divided by the difference in the number of hours of help-service used, giving the amount, in dollars, the company charges for each hour of help-service a customer uses.

Answer Key

Graphs and Equations of Lines

Question Number	Correct Answer	Rationale
4	A	Choice (A) is correct. Since y represents the amount of 4 points Jen scored, and the x-intercept is the value of x that satisfies equation $2x + 4y = 16$ when $y = 0$, Jen must have scored only 2 points each round. Since she scored a total of 16 points, she must have scored 2 points in 8 rounds.
5	B	Choice (B) is correct. The y-value of the line increases 2 units for every 3 units of increase in the x-value. Therefore, the slope of the line is $\dfrac{2}{3}$. The line also intersects the y-axis at 2, and therefore the y-intercept is 2.

Answer Key

Polynomials and Quadratic Applications

Question Number	Correct Answer	Rationale
1	C	 Choice (C) is correct. The figure can be divided into three nonoverlapping rectangles. One has area $x(z-t)$, one has area $t(y-x)$ and one has area xt. The sum of the areas is then $(xz-xt)+(ty-tx)+tx = xz - xt + ty$.
2	B	Choice (B) is correct. By the law of exponents that $(xy^3z^4)(x^{-4}y^{-3}z^{-1}) = x^{(1-4)}y^{(3-3)}z^{(4-1)}$. Therefore, $(xy^3z^4)(x^{-4}y^{-3}z^{-1}) = x^{-3}y^0z^3$. This is equivalent to $\dfrac{z^3}{x^3} = \left(\dfrac{z}{x}\right)^3$.
3	C	Choice (C) is correct. By definition, the expression $\left(\dfrac{a}{2}-b\right)^2$ is $\left(\dfrac{a}{2}-b\right)\left(\dfrac{a}{2}-b\right)$. This expression is equivalent to $\left(\dfrac{a}{2}\right)^2 - b\left(\dfrac{a}{2}\right) - \left(\dfrac{a}{2}\right)b + b^2$. It follows that $\left(\dfrac{a}{2}-b\right)^2$ is equivalent to $\left(\dfrac{a}{2}\right)^2 - \dfrac{ab}{2} - \dfrac{ab}{2} + b^2$, which simplifies to $\dfrac{a^2}{4} - ab + b^2$.
4	C	Choice (C) is correct. The expression $x^2 - 3x - 18$ factors as $(x-6)(x+3)$. Since $x^2 - 3x - 18 = 0$, either $x-6=0$ or $x+3=0$. It follows that $x=6$ or $x=-3$. Of the options given, only 6 is a possible value for x.

Answer Key

Polynomials and Quadratic Applications

Question Number	Correct Answer	Rationale
5	B	 Choice (B) is correct. The quadratic expression $-x^2 + 40x - 175$ factors as $(x-5)(35-x)$. It follows that the graph of $f(x) = -x^2 + 40x - 175$ intersects the x-axis at $x = 5$ and at $x = 35$. The greatest value of $f(x)$ occurs at the vertex, and the x-coordinate of the vertex of the parabola is the point halfway between 5 and 35 on the x-axis. This is $5 + \dfrac{35-5}{2} = 20$. So the value of x for which $f(x)$ is greatest is $x = 20$.

Answer Key

Reading		
Question Number	**Correct Answer**	**Rationale**
1	B	Choice (B) is correct. The main idea of the passage is that PVC, the durable plastic used in many water pipes, was discovered by accident when Henri Victor Regnault—who it seems was not trying to invent a plastic— "observed a mysterious white solid plastic forming inside some test tubes that were left exposed to sunlight in his lab." Choices (A), (C), and (D) are incorrect. The author of the passage gives no indication that PVC is formed from a rare or unusual chemical compound, that PVC was Regnault's only major scientific discovery, or that PVC is less pliable or flexible than metal.
2	A	Choice (A) is correct. The first sentence of the passage indicates that "old bone cells" are constantly "dying and being discarded," and the second sentence refers to the body "adding bone tissue to replace dying tissue." It is clear that the human body adds bone mass to replace dead bone tissue—the old cells that are being discarded. Choices (B), (C), and (D) are incorrect. The author of the passage does not indicate that adding bone mass *prevents* bone tissue from being discarded, and there is no mention of exercise or stress.
3	B	Choice (B) is correct. In the first sentence of the passage, the author explains that the 1924 "discovery of the Bornean rainbow toad" was originally "thought to be a case of mistaken identity" but "was recently verified by scientists." In this context, "verified" most nearly means "confirmed." The author's point is that scientists confirmed, or established the truth of, the discovery when they found "three specimens." The author is not indicating that scientists "revealed" or "documented" the 1924 discovery; it is clear that the *explorers* made records of their discovery and then told others about it. Therefore, choices (A) and (D) are incorrect. And choice (C) is incorrect because it is illogical to suggest that scientists today could have "controlled" the discovery that occurred in 1924.
4	A	Choice (A) is correct. The author points out that the film *Nosferatu* is "closely based on"—but not exactly the same as—"Bram Stoker's 1897 novel, *Dracula*." He or she explains that the vampire in *Nosferatu* is "called 'Count Orlok' rather than 'Count Dracula'" in order to show that the makers of *Nosferatu* made minor changes to Stoker's story as a result of being "unable to secure the rights" to *Dracula*. Choices (B), (C), and (D) are incorrect because the author does not indicate that the characters in *Nosferatu* were based on real people, and he or she neither criticizes *Nosferatu* for its differences from *Dracula* nor praises the makers of the film for their imagination in recreating Stoker's novel.
5	C	Choice (C) is correct. The author of the passage states that the public pillow fights were planned by an organization whose goal is "to foster community enjoyment of public spaces." It makes sense to say, then, that the organization probably planned the pillow fights as a way to "encourage people to make greater use of public areas." Choices (A), (B), and (D) are incorrect because they do not relate to the enjoyment of public spaces (the goal of the "Public Space Movement").
6	D	Choice (D) is correct. The author of the passage states that the desert locust, which "has been responsible for damage to populations across three continents," causes damage by "consuming its body weight in food each day." He or she notes that "when millions of locusts swarm into an area," it is "catastrophic" to food supplies. This information implies that the locust does its greatest damage by consuming the food supplies of other species (including humans). Although the author mentions locusts destroying vegetation by devouring it, he or she makes no mention of locusts destroying infrastructure; therefore, choice (A) is incorrect. Choices (B) and (C) are incorrect because the author does not mention locusts either spreading disease or attacking other insects.

Answer Key

7	C	Choice (C) is correct. The author is impressed by plywood's qualities; he or she seems to admire the flexibility, low cost, and strength that make plywood "an incredibly important building material in house construction." Choice (A) is incorrect because the author does admire plywood's qualities but does not seem ecstatic, or overjoyed. Although the author notes that plywood has become important despite not being aesthetically pleasing, there is no indication that the author is surprised by plywood's qualities; therefore, choice (B) is incorrect. Finally, choice (D) is incorrect because the author certainly is not dismissive of plywood's qualities; he or she admires them rather than dismissing or rejecting them.
8	A	Choice (A) is correct. The author states that the dentures of the 18th and 19th centuries, which were made of ivory and porcelain, had a more "natural" look than the previous dentures, which had been made of wood and animal teeth. Teeth made of ivory or porcelain would likely look more "natural"—that is, more like human teeth—than animal teeth or wooden teeth would. Choices (B) and (C) are incorrect because the passage does not indicate that the dentures of the 18th and 19th centuries contained real human teeth or animal teeth. Choice (D) is incorrect because the author uses the word "natural" to describe the appearance of the dentures, not the materials used to make the dentures.
9	B	Choice (B) is correct. The author of Passage 1 finds it very troubling that so many children spend their time on computers and other electronic devices instead of playing outside. The author of Passage 2, on the other hand, thinks technology should be an even bigger part of children's lives than it already is. It is likely that the author of Passage 1 would criticize the author of Passage 2 for failing to think about the drawbacks of this increased time spent on technology—such as a decreased amount of time to spend "learn[ing] and develop[ing] through outdoor activities." Choice (A) is incorrect because the author of Passage 2 states that there is very little "reliable data," and choice (C) is incorrect because he or she does not discuss and dismiss development during outdoor activities. Choice (D) is incorrect because the author of Passage 1 makes no mention of careers, and there is no indication that the author of Passage 2 is exaggerating when speaking of careers.
10	C	Choice (C) is correct. The author of Passage 2 discusses the high costs of "going paperless" and concludes that "for many small businesses, it's just not worth the expense." The author of Passage 1 acknowledges the costs of going paperless ("it may be expensive in the long run"), but he or she proposes another option: using less paper. The author of Passage 1 would most likely criticize the author of Passage 2 for failing to consider the option of reducing, but not completely eliminating, paper in an office. Choice (A) is incorrect because the author of Passage 2 does not place much emphasis on the size of a company. Choice (B) is incorrect because the author of Passage 2 does note "the 'green' advantages" of going paperless. And choice (D) is incorrect because the author of Passage 2 speaks of technological considerations throughout the passage.

Answer Key

Revising and Editing Writing Section

Question Number	Correct Answer	Rationale
1	C	Choice (C) is correct. Sentence 2 indicates that the sport of "urban mushing" resembles "traditional dogsledding, only without the sleds or the...frozen terrain." Sentence 3 states that this sport is "for city residents"—a fact that readers who are paying attention already know, since "urban" means "city." Of the options, the best transition between sentence 2 and sentence 3 is "As the name indicates." Choices (A), (B), and (D) suggest relationships between the two sentences that are not supported by the passage.
2	C	Choice (C) is correct. The new sentence refers to "The American Dog Derby" and notes that this event began in Idaho in 1917 and is still in existence. The Derby is also an "example" of something ("The American Dog Derby, for example..."). Sentence 7 indicates that "dogsled races were popping up throughout Alaska and the Northwest" in the years following the "Alaska Gold Rush in the late 1800s" (mentioned in sentence 6). "The American Dog Derby," which began in the northwestern state of Idaho in 1917, is an example that supports the claim made in sentence 7. The new sentence makes the most sense if placed directly after sentence 7.
3	D	Choice (D) is correct. Sentence 11 uses the pronoun "they" ambiguously; it is unclear at first glance who "sought out a way to keep the dogs in shape during winter seasons." To find the answer, readers must look closely at the passage. Sentence 10 refers to "dogsled races," and sentence 11 states that "As participation in the races grew," people looked for a way to keep dogs in shape. These people started the sport of "urban mushing" in Seattle. Who were "they"? There is no reason to think that "Eskimos," "Olympic athletes," or "Californians" created the sport; context indicates that it was "dogsled racers."
4	B	Choice (B) is correct. Sentence 5 remarks that "Interestingly, the people known as Eskimos in the United States are called Inuit in Canada." The passage does mention Eskimos indirectly (they are the "indigenous peoples" referred to in sentence 4). However, sentence 5 is not about the passage's main topic, urban mushing, and does not provide a key link with any other sentence in the passage. Sentence 5 is essentially irrelevant and should be deleted. In contrast, sentences 2, 12, and 13 all provide important information and links to other sentences.
5	A	Choice (A) is correct. The new sentence notes that the term "spaghetti western" is usually meant by "film critics and historians" to refer to "four Leone films." Sentence 1 introduces the term "spaghetti westerns" and associates them with "the Italian director Sergio Leone," so the new sentence makes sense if placed after sentence 1. In addition, sentence 2 refers to "the spotlight on one director," which fits nicely following the new sentence's focus on films by Sergio Leone. On the other hand, placing the new sentence after sentences 2, 6, or 7 interrupts the flow of the passage.

Answer Key

6	C	Choice (C) is correct. The passage opens by explaining that Sergio Leone was the most famous director of the Italian films known as "spaghetti westerns," but that there were other films of this type made by other people. Paragraph 2 focuses on these other films. Paragraph 3 turns back to Leone and his accomplishments, arguing in sentence 8 that "Leone deserves the attention he received." The appropriate transition word to insert before sentence 8 is "Regardless"—in other words, "regardless" of the fact that there were all these other films being made, Leone was still great.
7	A	Choice (A) is correct. The two existing sentences indicate that "Leone hired his star..." and "Eastwood [the star] played a sullen gunslinger." However, it is not especially helpful or efficient to include the clause "Leone hired his star" as a separate or main piece of information because it merely repeats information in sentence 8 (Leone "made Clint Eastwood an international star"). Rather, the two sentences should be combined into a single sentence explaining what Leone hired Eastwood to do: "Leone hired his star, who was on hiatus from the television show *Rawhide*, to play a sullen gunslinger..." Additionally, choices (B), (C), and (D) all include the ambiguous pronoun "he."
8	D	Choice (D) is correct. Sentence 12 is the only sentence in the passage that is not about "spaghetti westerns" (except for sentence 10, which should be combined with sentence 11). It is linked to the previous sentences through to its reference to Eastwood's fame, but it is not necessary to the passage as a whole. The passage has already established that Leone "made Clint Eastwood an international star." No additional information about Eastwood's career is necessary or relevant to the topic of "spaghetti westerns."

Diagnostic and Placement Test Sample Questions