

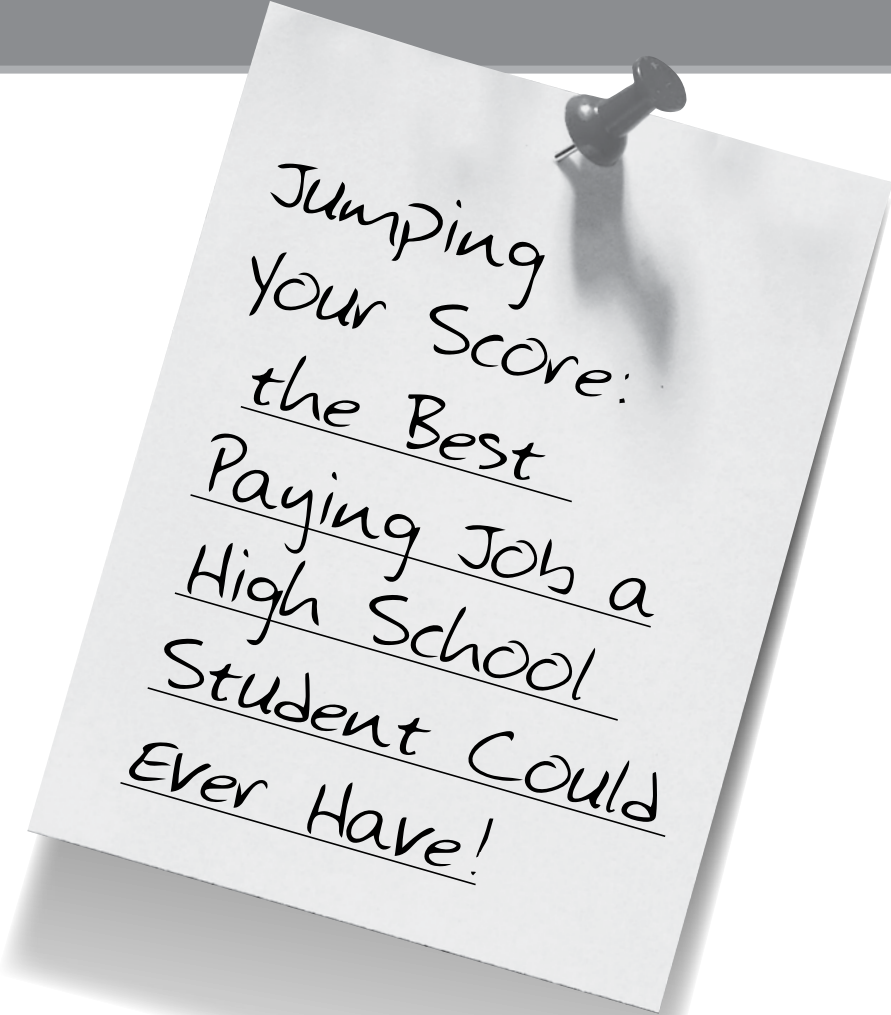
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ENGLISH TEST

45 Minutes—75 Questions

DIRECTIONS: Certain parts of the following five passages have been underlined. In some cases the underlined portion is a word or a phrase; in others it is an entire sentence or parts of two sentences. Each underlined portion is numbered. To the right of the passage you will see numbers which correspond to the underlined portions of the passages. Choose the answer that best expresses the idea, makes the statement correct in Standard English, or is worded in such a way as to convey the tone and style of the passage. If you think the original version of the underlined portion is best, choose “NO CHANGE.”

There are also questions which ask about a section of the passage or the entire passage. These questions don't refer to any underlined portions of the passage, but rather refer to numbers in a box within the passage. For each question, choose the alternative you consider best and fill in the corresponding letter on your answer sheet. Read the entire passage before you begin answering the questions. In some cases, questions require you to read the lines before and after the portion of the passage being questioned. Be sure you have understood the entire section of the passage before answering the question.

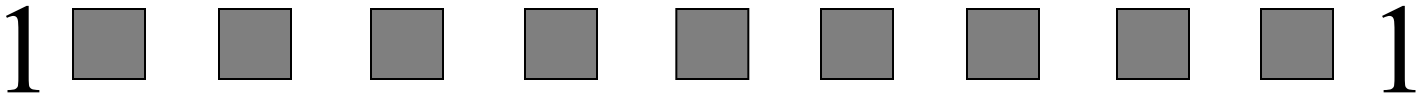
Passage I

Puerto Rican Art in America

It was during the Spanish-American War of 1898 when Spain ceded Puerto Rico to the United States, which became a territory. ¹ Puerto Ricans eventually became U.S. citizens, and—in 1952—the island was declared a Commonwealth of America. This means that ² the island maintains its autonomy, its citizens remain voluntarily ² united with America.

In the late 1940s and 50s Operation Bootstrap, a collaborative ³ effort between the already existing governor of Puerto Rico ⁴ and President Harry Truman, encouraged a massive migration of Puerto Ricans to major Northeastern cities, of particular interest: New York City. The city experienced a major ⁵ ⁶ influx of Puerto Ricans during these years. Many Puerto Ricans ⁶ continue to view both El Barrio (a section of New York City

1. A. NO CHANGE
B. turning the island into
C. that became
D. OMIT the underlined portion
2. F. NO CHANGE
G. This has meant that the island
H. The fact that, eventually, the island
J. This means that, although the island
3. A. NO CHANGE
B. Operation Bootstrap;
C. Operation Bootstrap:
D. Operation Bootstrap
4. F. NO CHANGE
G. already
H. existing
J. OMIT the underlined portion
5. A. NO CHANGE
B. including New York City
C. interestingly, New York City
D. of particular interest – New York City
6. Given that the author wants to use active voice as much as possible, which sentence is the best choice?
F. NO CHANGE
G. A major influx of Puerto Ricans was experienced by the city during these years.
H. A large number of Puerto Rican immigrants were embraced by the city during this time.
J. New York City was enhanced culturally by a new wave of Puerto Rican residents.



being known as Spanish Harlem) and the island of Puerto Rico as

home. 8

A truly Puerto Rican artistic movement did not begin

to emerge until after World War II. At this time, many Puerto Rican artists turned to Mexican Modernism—an art movement popular in the 1920s and 30s. Many studied with Mexican masters.

Mexican approaches to expression were adopted by these Puerto

Rican artists, such as muralism and print-making. Studying with other masters, Puerto Rican artists would learn established techniques while developing their own interpretations of the artistic form. However, the Puerto Rican art movement did not yet have a face.

In the 1950s and 60s, two Puerto Rican artists rose to prominence in New York and on the island. One was Lorenzo Homer, 12 His striking images, augmented with beautiful text, became a hallmark of Puerto Rican art in the 1950s.

Rafael Tufino, another prominent Puerto Rican artist, lived

7.
 - A. NO CHANGE
 - B. having been known
 - C. also known
 - D. also being known

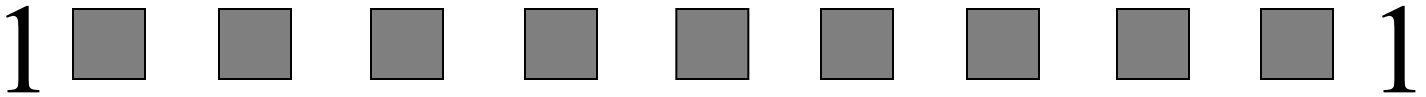
8. Assuming all of the following are true, which of these sentences best concludes this paragraph while introducing the information in the rest of the essay?
 - F. This dichotomy between cultural independence and close ties with the U.S. has greatly influenced Puerto Rican art.
 - G. Though much of the Puerto Rican art world would borrow heavily from Mexican Modernism, it eventually managed to create its own style.
 - H. New York City experienced a massive migration of Puerto Ricans over the years and welcomed them.
 - J. Many Puerto Ricans would eventually serve in the U.S. Army during World War II.

9. Which of the following is LEAST acceptable?
 - A. NO CHANGE
 - B. Modernism: an art movement
 - C. Modernism, an art movement
 - D. Modernism an art movement

10.
 - F. NO CHANGE
 - G. These Puerto Rican artists adopted Mexican approaches to expression, such as
 - H. Mexican approaches to expression were taught to these Puerto Rican artists, such as
 - J. The Mexican approaches to expression adopted by Puerto Rican artists were:

11. Which of the following choices is NOT acceptable?
 - A. NO CHANGE
 - B. Still,
 - C. Nevertheless,
 - D. Therefore,

12. Given that all of the following are true, which of the following, if inserted here, would be most appropriate?
 - F. who began a movement of distinctively Puerto Rican art in the areas of poster making and calligraphy.
 - G. who enjoyed art tremendously.
 - H. who created art that could be called Puerto Rican.
 - J. who became the most famous of the two.



on the island and in New York City, moving regularly between the two. Having studied with Puerto Rican artists on the island before serving in the U.S. Army in Panama, Tufino's distinguished style can be found in his linoleum block prints, book illustrations, and paintings of cultural dances.

Today, New York City remains the center of Puerto Rican art, more because of its now robust history than that of migration trends. New artists have added graffiti works and other mediums to the traditional style. While the names involved have changed, the continuing search for a reconciliation between a sense of belonging and a sense of independence remains the inspiration behind Puerto Rican art.

13. A. NO CHANGE
 B. Tufino ultimately focused on
 C. Tufino's influence ranged far beyond his trademark
 D. Tufino's greatest works were ultimately his
14. F. NO CHANGE
 G. for the migration trends
 H. because of migration trends
 J. the once migration trends

Question 15 poses a question about the passage as a whole.

15. Suppose the writer had intended to write an essay detailing the biographies of Puerto Rico's first great artists. Has the writer accomplished this goal?
- A. Yes, because the essay discusses early Puerto Rican artists.
 B. Yes, because the essay focuses on the lives of Homer, Tufino, and Oller.
 C. No, because the focus of the essay is on the search for a Puerto Rican artistic identity.
 D. No, because the essay talks about how Puerto Rican artists studied with South American masters.

Passage II

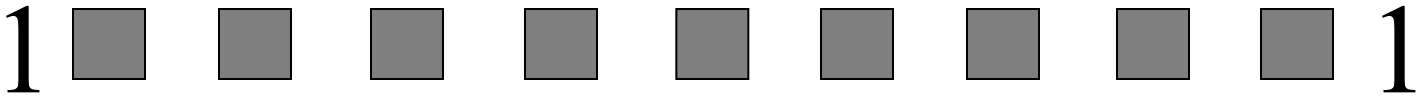
[The following Paragraphs may or may not be arranged in the best possible order. The last question will ask you to choose the most effective order for the paragraphs as numbered.]

Computer Viruses

[1]

The theoretical possibility that computer viruses could exist was first posed by John von Neumann in 1949. His lectures expanded upon the idea that a computer program could be developed with the ability to self-reproduce. In 1972, Veith Risah

16. The LEAST acceptable placement for the underlined word is
- F. where it is now.
 G. before the word *was*.
 H. before the word *by*.
 J. before the word *John*.
17. A. NO CHANGE
 B. the idea, that
 C. the idea that:
 D. the idea that—



published an article which described the code for a fully

functional virus. In 1984, Fred Cohen coined the term 'virus' to
18
refer to a self-reproducing computer program modems.
18

[2]

With the rise of personal computing, new and varied threats
to computer security has also risen. Whenever a new technology
19
is introduced, there are people who develop programs to attack its

weaknesses. They are called 'malware,' short for 'malicious
20

software,' and include computer viruses, adware, spyware,
21

worms, and Trojan Horses. All of these forms of malware either
22
are designed to gain access to data or to wreak havoc on

operating systems. However, the most subtle and cunning form
23
of malware is a computer virus.
23

[3]

Before the rise of computer networking, most viruses spread
through removable media; floppy disks being a common one.
24

Many early viruses installed themselves on a disk's boot sector,

the portion of a disk used to start a computer and make it boot
25

up. This ensured that the virus launched when the computer
26
was turned on.

18. F. NO CHANGE
G. the term, 'virus,' to refer,
H. the term: 'virus' to refer
J. the term 'virus,' to refer

19. A. NO CHANGE
B. have also arisen
C. rised
D. have rose

20. F. NO CHANGE
G. These computers are
H. It is
J. These programs are

21. Which of the following alternatives to the underlined
portion would NOT be acceptable?

- A. which include
B. such as
C. which can include
D. to include

22. The best placement for the underlined word is

- F. where it is now.
G. after the word *designed*.
H. after the word *gain*.
J. after the word *access*.

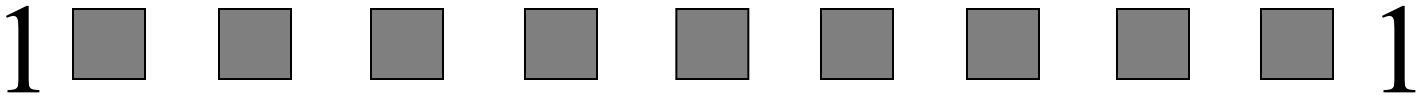
23. Which of the following courses of action involving the
underlined sentence would organize the information in
paragraphs 2 and 3 in the most logical manner?

- A. NO CHANGE
B. Start Paragraph 2 with this sentence
C. Move the sentence to the end of Paragraph 3
D. OMIT the sentence

24. F. NO CHANGE
G. media; which were, at the time, floppy disks
H. media, floppy disks were the most common one
J. media, commonly floppy disks

25. A. NO CHANGE
B. and cause it to begin working
C. and boot it up
D. OMIT the underlined portion.

26. F. NO CHANGE
G. despite
H. where
J. OMIT the underlined portion.



[4]

With the widespread use of computer networks and the Internet, viruses and other malware have spread exponentially.

New designer viruses can send email from your computer to your contacts without your knowledge, this infects your contacts'

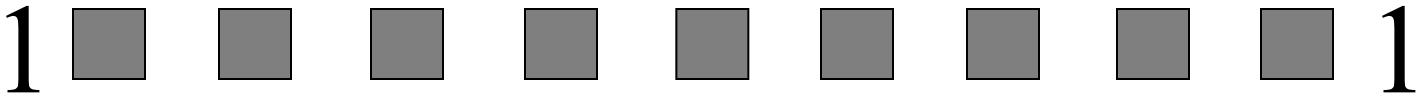
27

computers. Some malicious code can hide on legitimate websites, launching when you open a link, download a program, or click on a pop-up ad. 28

[5]

A virus infects the operating system of a computer, the typical remedy is to wipe the hard drive and reinstall the operating system. This can result in the loss of data that was not properly backed-up. However, savvy users can avoid these viruses by being cautious about using new programs, downloading files, or visiting websites for the first time. 30

- 27. A. NO CHANGE
B. knowledge; infecting
C. knowledge infecting
D. knowledge, infecting
 - 28. Which of the following sentences, if inserted at this point in the passage, would be most logical, relevant, and effective?
 - F. Practicing caution while on the internet is only part of the remedy: all computer users should install and regularly update effective virus protection software.
 - G. Ultimately, these programs will spread to the Australian Internet, causing problems for users.
 - H. Computers were not always in such danger before the invention of the Internet.
 - J. Several people claim credit for the creation of the Internet, but few claim credit for malware.
 - 29. A. NO CHANGE
B. Although a virus infects
C. After a virus infects
D. All viruses infect
- Question 30 asks about the essay as a whole.
- 30. Which of the following changes to the order of the paragraphs would provide the most logical sequence for the essay?
 - F. NO CHANGE
 - G. Switch Paragraphs 1 and 5
 - H. Switch Paragraphs 1 and 2
 - J. Switch Paragraphs 3 and 4



Passage III

A College Experience

[1]

I had spent half of my junior year of high school and all of my senior year working towards, preparing for, anticipating this day.
31

- 31. A. NO CHANGE
- B. prepared for, anticipating
- C. preparing for, and anticipating
- D. prepared for, and anticipating

It was my first day of college, and I was filled with excitement and fear. After four years, students typically have they're high school
32
33

- 32. Which choice would NOT be acceptable?
- F. NO CHANGE
- G. college – I
- H. college; I
- J. college and I

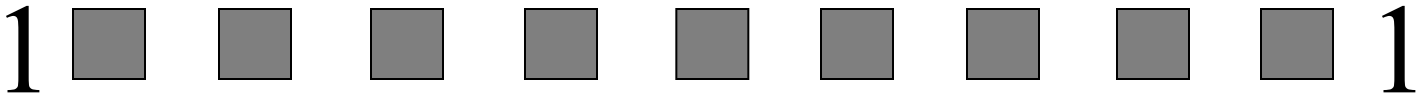
figured out. They know the rules, the groups, and the teachers; all the details that enable them to thrive in their environment. But college is an altogether different challenge, and I was both terrified and exuberant.
34
35

- 33. A. NO CHANGE
- B. there
- C. his
- D. OMIT underlined portion.
- 34. F. NO CHANGE
- G. teachers—it's the
- H. teachers, the
- J. teachers all the

[2]

My first class was with Dr. McGinn, a Shakespearean scholar who had written numerous textbooks on the subject. He was 77 years old at that time. He was an exacting professor who demanded memorization, constant attention, and a grasp of world literature. 37

- 35. Which of the following is NOT acceptable?
- A. NO CHANGE
- B. challenge; I
- C. challenge and I
- D. challenge: I
- 36. Which of the following alternatives for the underlined portion would NOT be acceptable?
- F. then
- G. when I took the class
- H. at that age
- J. that year
- 37. At this point, the writer wants to illustrate how demanding Dr. McGinn could be. Which of the following sentences would best accomplish this goal while remaining relevant and consistent with the information in the paragraph?
- A. In addition, he would lavish praise on those who did well in his class.
- B. In fact, two students dropped the course after the first day.
- C. His tests were easier than his lectures would indicate because they were only two questions long.
- D. At any time, he would call students to the front of the classroom for an oral exam on the assigned reading, and the students would be quizzed until he was certain that they had not only read but also mastered the material.



Being fearful of him, I persevered and learned more about
38

Shakespeare than I would have from any other professor. I learned
that nothing worthwhile comes with ease.
39

[3]

My second class was with Dr. Young, who taught British
History. She walked into the room, I felt at ease. Her informal
40

demeanor and casual style were relaxing me. Dr. Young would
41 42
become my mentor in the history department and a friend. Because
42 43
of the friendships I enjoyed with many of my professors, I
43
recommend small seminar-style classes to all students. Lectures
rarely allow the professor to even learn your name.

[4]

College turned out to be the best four years of my life up to
44
that time. I learned a tremendous amount about history and
literature, but also about how to truly learn by asking questions and
then searching for answers.

38. F. NO CHANGE
G. In fact
H. Though
J. Because

39. Which choice would be most appropriate?
A. NO CHANGE
B. Shakespeare is history's finest English language author.
C. I learned that lessons of value sometimes have no price.
D. Language is culture's foundation.

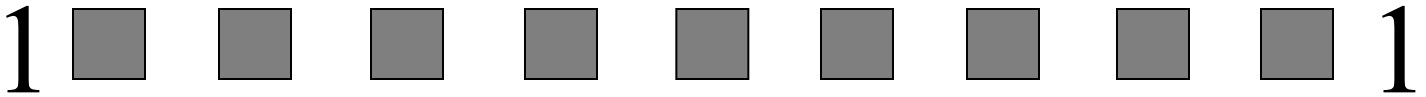
40. F. NO CHANGE
G. Having been walked
H. When she walked
J. OMIT the underlined portion (beginning into with a capital 'I').

41. A. NO CHANGE
B. provided a healthy complement to Dr. McGinn's demanding approach.
C. seemed historical.
D. confounded me.

42. F. NO CHANGE
G. will become
H. becomes
J. had become

43. A. NO CHANGE
B. Despite
C. With regard to
D. Notwithstanding

44. F. NO CHANGE
G. In fact, college
H. With all of these occurrences, college
J. Despite my first impressions, college



Had I not dove⁴⁵ fully into my college experience, I would not know now all that was possible. Those who merely attend college casually miss much.

45. A. NO CHANGE
B. diven
C. dived
D. diving

Passage IV

Texting and Teen Addiction

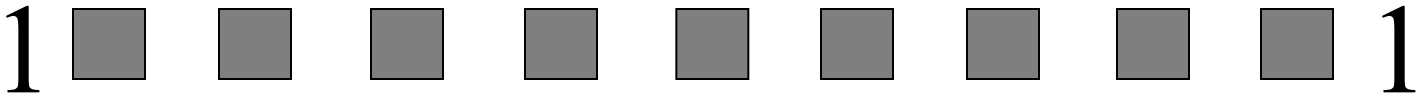
During the last thirty years, one wave of technological innovation after another has broken onto the global scene.

Each of these waves occur⁴⁶ more frequently than ever; the⁴⁷ evolution of the cell phone and the internet-delivered movie

shows⁴⁸ how the pace of change continues to hasten.

Educators and psychologists for example⁴⁹ are becoming concerned about the 600% increase in cell phone SMS, or ‘texting,’ among teenagers.

46. F. NO CHANGE
G. occurs
H. are occurring
J. have occurred
47. Which choice would NOT be acceptable?
A. NO CHANGE
B. ever. The
C. ever and the
D. ever: the
48. F. NO CHANGE
G. have shown
H. are showing
J. show
49. A. NO CHANGE
B. psychologists for example
C. psychologists, for example
D. psychologists, for example,



In 2009, The Pew *Internet and American Life* Project found that one-in-three teenagers send more than 100 text messages a
50

day, in most cases responding immediately to texts. The poll also
51

reports that 54% of teens texted daily during 2009. Girls between 14 and 17 years of age comprise the largest segment of the
52
teenage texting population. In 2009, this age group of girls average more than 100 messages a day. Among teens, texting
53

is more than all other forms of communication, including face-to-
54
face interaction, calling by phone, and instant messaging.

What is especially concerning to educators is that the study reported that 64% of teens texted while in class. Students who
55
are texting during class are distracted from their work.
56

Furthermore, texting is a threat to academic integrity as it creates a new avenue for cheating. Texting has become so pervasive that Dr. Seyffert of the JFK Medical Center at Seton Hall University has found that one-in-five teens routinely interrupts his or her sleep to text. Cases of cyber-bullying within the teenage population has also become increasingly prevalent.
57

50. F. NO CHANGE
G. sends
H. are sending
J. have sent

51. Which of the following alternatives to the underlined portion would NOT be acceptable?
A. often
B. hypothetically
C. typically
D. usually

52. F. NO CHANGE
G. comprises
H. mirror
J. mirrors

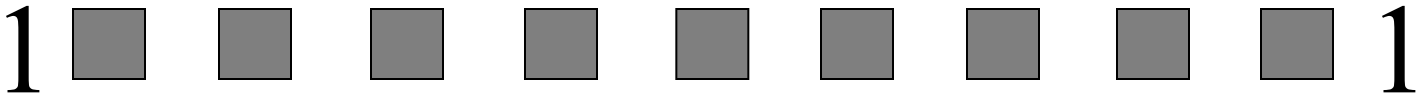
53. A. NO CHANGE
B. are averaging
C. were averaging
D. averaged

54. The writer would like to suggest how much texting has taken control of teenagers' time. Which one best accomplishes the writer's goal?
F. NO CHANGE
G. has become higher than
H. far surpasses
J. is greater than

55. A. NO CHANGE
B. whom are
C. whom were
D. which are

56. F. NO CHANGE
G. by their phones
H. with their gadget
J. OMIT the underlined portion.

57. A. NO CHANGE
B. have also become
C. has also become
D. have also become



Has texting become a new addiction for teens, or is it merely a passing obsession? Dr. Seyffert notes that neuro-imaging studies on texting teens show that the same areas of the brain light up as when a drug addict uses drugs. This explains why many teens report anxiety when they are unable to text. Some argue, though, that the obsession with texting will pass as the novelty wears off and the behavior normalizes into everyday life.

At present, texting raises concerns, especially when teens text in class, lose sleep, or text while driving. Although these behaviors can be brought under control, texting can become a fun diversion rather than a psychological need.

58. F. NO CHANGE
G. he or she are
H. he or she is
J. he or she may be

59. A. NO CHANGE
B. While
C. As long as
D. Most likely,

60. Which of the following best summarizes the purpose of the passage?
F. Texting is an addiction that needs to be treated.
G. Texting may seem harmless, but its growing use, especially among teens, can be harmful.
H. Texting in America has become more prevalent than any experts initially predicted.
J. Texting is a positive, healthy technological advancement.

Passage V

William Jennings Bryan

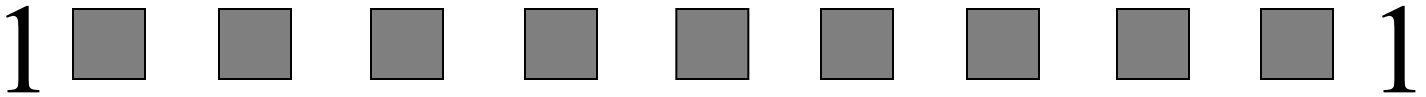
[1]

On March 19, 1860, William Jennings Bryan was born in Salem, Illinois. During Bryans adolescence, William developed a sturdy belief in the goodness and potential of all people.

Nevertheless, he became known as a beacon to the common person, gaining the title “The Great Commoner.”

61. A. NO CHANGE
B. During Bryans’ adolescence
C. During Bryan’s adolescence
D. During the adolescence of Bryan’s

62. F. NO CHANGE
G. However,
H. Ultimately,
J. Yet,



[2]

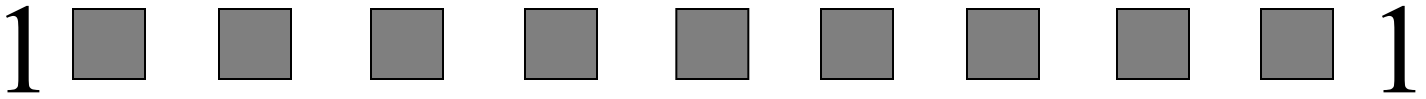
As a young man, Bryan's education was completed at the
Illinois College and then the Northwestern University School of
Law. There he met Mary Elizabeth Baird, a fellow law student.
 They married in 1884. Early in his career as a Nebraska lawyer
 and politician, Bryan found he had a tremendous talent for giving
speeches during which he would espouse the ideals of free-silver,
 trust-busting, and railroad regulation. His outstanding oratorical
 skills included: a dramatic speaking style, the ability to speak
 without notes, and a booming voice that could be easily heard
 without amplification.

[3]

(1) Bryan ran for president of the United States three times
in his political career: in 1896, 1900, and 1908. (2) The
 Republicans, however, portrayed him as a danger to the sturdy
 backbone of the currency gold. (3) Each time, his platform of free
 silver, anti-imperialism, and other populist principles made him
 wildly popular with the struggling farmers in the West and South.
 (4) Consequently, he lost all three campaigns for president as the
 Midwestern middle class and Northeastern elite voted against him.

69

63. A. NO CHANGE
 B. the schools he attended were Illinois College and then the Northwestern University School of Law.
 C. Bryan attended the Illinois College and then the Northwestern University School of Law.
 D. his education was completed at the Illinois College and then the Northwestern University School of Law.
64. Which of the following alternatives to the underlined portion would NOT be acceptable?
 F. speeches;
 G. speeches—
 H. speeches in which
 J. speeches, where
65. A. NO CHANGE
 B. included
 C. includes
 D. includes:
66. Which placement of the underlined word would be LEAST acceptable?
 F. where it is now
 G. after the word *that*
 H. after the word *heard*
 J. after the word *voice*
67. A. NO CHANGE
 B. in his life
 C. which is unusual
 D. OMIT the underlined portion
68. F. NO CHANGE
 G. currency—gold
 H. currency; gold
 J. currency, being gold
69. Which of the following is the best order for the sentences in Paragraph 3?
 A. 1, 2, 3, 4
 B. 1, 3, 2, 4
 C. 2, 4, 3, 1
 D. 4, 2, 3, 1



While upset by the losses, Bryan remained a larger-than-life figure in American politics. 70 In Wisconsin, he

once made 12 speeches in 15 hours. However, he would speak 71

at events for up to six hours at a time. The fame eventually 72 brought him to the attention of President Woodrow Wilson, who appointed Bryan Secretary of State in 1913. However, Bryan left in 1915 because of what he perceived to be 73 Wilson's aggressive views on World War I and imperialist policies in the Philippines.

Bryan would fight for his moral and religious ideals during Prohibition and as a part of the Progressive Movement, but he is probably best known for his role in the Scopes Monkey Trial. Bryan led the prosecution against John W. Scopes, a high school teacher accused of teaching evolution. Bryan was religiously opposed to the Theory of Evolution because he believed it to be based on laws of cruelty and indifference rather than on love. He won the trial but died in 74 his sleep five days later on July 26th, 1925.

70. Upon reviewing the essay, the writer has decided that a sentence is needed at this point that will provide a logical, effective connection between the sentence that precedes it and the sentence that follows it. Which of the following sentences would best accomplish this objective?
- F. The 1900 election took a particular toll on Bryan, and he felt that the party had betrayed him by becoming more moderate.
 - G. Bryan would eventually reenter the national stage, but that was still to come.
 - H. Bryan remained incredibly popular for the fiery speeches that he continued to make across the country.
 - J. Bryan's religious ideals continued to influence his political outlook.

71. A. NO CHANGE
B. In those times,
C. Consequently,
D. OMIT the underlined portion (capitalizing 'he').

72. F. NO CHANGE
G. That
H. Bryan's
J. Wilson's

73. Given that all of the choices are true, which one provides the most specific detail and maintains the style and tone of the essay?
- A. NO CHANGE
 - B. walked out
 - C. resigned in protest
 - D. eventually went away

74. F. NO CHANGE
G. for love
H. about love
J. in love

Question 75 asks about the passage as a whole.

75. Which of the following titles best captures the essence of the essay?
- A. William Jennings Bryan: One of America's Best Orators
 - B. William Jennings Bryan: Pathway from Illinois to Nebraska
 - C. William Jennings Bryan: Man of the Plains and the People
 - D. William Jennings Bryan: Those Who Are Quiet Are Rarely Heard.

END OF SECTION 1
STOP! DO NOT TURN THE PAGE
UNTIL TOLD TO DO SO.
12 DO NOT RETURN TO THE PREVIOUS TEST.

MATHEMATICS TEST
60 Minutes—60 Questions

DIRECTIONS: Solve each problem, choose the correct answer from among the choices presented, and fill in the corresponding oval on your answer sheet.

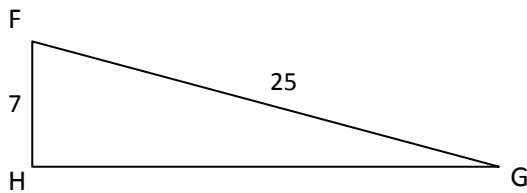
Do not spend too much time on any one problem. Solve as many problems as you can, coming back to difficult problems if you have time.

You may use a calculator on any problem you wish, though some problems are better solved without the use of a calculator.

Note: Unless the problem states otherwise, the following will always be true.

1. Illustrated figures are not necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* refers to a straight line.
4. The word *average* always refers to the arithmetic mean

1. Given right triangle $\triangle FGH$ below, how many units long is \overline{HG} ?



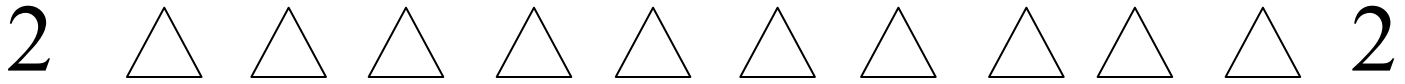
- A. 18
 B. 20
 C. 23
 D. 24
 E. 26
2. Eric hiked $5\frac{3}{4}$ miles on Monday and $2\frac{5}{8}$ miles on Tuesday. What is the total distance in miles that Eric hiked over the two days?
- F. $7\frac{7}{8}$
 G. 8
 H. $8\frac{3}{8}$
 J. $8\frac{1}{2}$
 K. $8\frac{3}{4}$
3. Jill's photography studio charges a sitting fee of \$50.00. If she raises this fee by 17.5%, what will the new sitting fee be?
- A. \$50.88
 B. \$58.75
 C. \$62.50
 D. \$67.50
 E. \$85.00

4. All six grades at an elementary school raised money to help establish a community garden on the school grounds. The amount raised by each class is listed in the table below.

Grade Level	K	1	2	3	4	5
Money Raised	\$225	\$300	\$150	\$375	\$100	\$275

What is the median dollar amount raised?

- F. \$225.00
 - G. \$237.50
 - H. \$250.00
 - J. \$262.50
 - K. \$275.00
5. Cameron drives 55 miles per hour for 3 hours; Kellan drives 70 miles per hour for $2\frac{1}{2}$ hours. What is the difference, in miles, between the distance Cameron drove and the distance Kellan drove?
- A. 0
 - B. 10
 - C. 15
 - D. 20
 - E. 45
6. If $3(x + 7) = -9$, then $x = ?$
- F. -10
 - G. -9
 - H. -4
 - J. 0
 - K. 2
7. In the standard (x,y) coordinate plane, if the y coordinate of each point on a line is 2 less than $\frac{1}{2}$ the x coordinate, what is the slope of the line?
- A. -2
 - B. $-\frac{1}{2}$
 - C. $\frac{1}{4}$
 - D. $\frac{1}{2}$
 - E. 4



8. $\frac{5f}{7} + \frac{3g}{2}$ is equivalent to:

- F. $\frac{8fg}{9}$
- G. $\frac{15fg}{14}$
- H. $\frac{5f+3g}{14}$
- J. $\frac{10f+21g}{14}$
- K. $\frac{31fg}{14}$

9. Angel Falls, located in Venezuela, is the world's tallest waterfall. Its height is 3,212 feet. Given that there are approximately 3.28 feet in a meter, to the nearest meter, how many meters tall is Angel Falls?

- A. 105
- B. 979
- C. 1,021
- D. 9792
- E. 10,535

10. The sum of j and k is 14. Their difference is 4. What is their product?

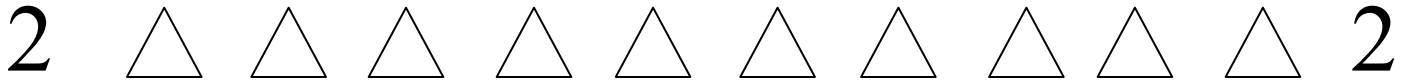
- F. 4
- G. 5
- H. 9
- J. 45
- K. 48

11. Which of the following is a polynomial factor of $x^2 - 11x + 28$?

- A. $(x - 14)$
- B. $(x - 4)$
- C. $(x - 2)$
- D. $(x + 2)$
- E. $(x + 7)$

12. In the standard (x, y) coordinate plane, a rectangle has vertices at points $(6, 2)$, $(-2, 2)$, and $(6, -4)$. Which of the following is the fourth vertex?

- F. $(-2, 4)$
- G. $(2, -4)$
- H. $(-2, -4)$
- J. $(-2, 6)$
- K. $(2, 6)$



13. The perimeter of a square is 16. What is the length of one of its diagonals?

- A. 4
- B. $4\sqrt{2}$
- C. 8
- D. $8\sqrt{2}$
- E. 12

14. Which of the following is greater than $\frac{6}{7}$?

- F. $\frac{7}{9}$
- G. $\frac{9}{11}$
- H. $\frac{13}{15}$
- J. $\frac{14}{17}$
- K. $\frac{16}{19}$

15. What is the slope of any line parallel to the line $4x + 7y = 28$?

- A. -4
- B. $-\frac{7}{4}$
- C. $-\frac{4}{7}$
- D. $\frac{7}{4}$
- E. 4

16. A triangle has sides that measure 8, 10, and 16 inches. How many inches long is the longest side of a similar triangle with a perimeter of 102 inches?

- F. 16
- G. 20
- H. 32
- J. 48
- K. 64

17. Which of the following operations will produce the largest result when substituted for the blank in the expression: $8 \underline{\hspace{1cm}} .25$?

- A. plus
- B. minus
- C. multiplied by
- D. divided by
- E. averaged with

18. Which of the following is equivalent to $-(3ab^4)^3$:

- F. $-27a^3b^{12}$
- G. $-27a^3b^7$
- H. $-3ab^{12}$
- J. $-3ab^7$
- K. $27a^3b^{12}$

19. If $f(x) = 4x^2 - 7x - 2$, then $f(-3) = ?$

- A. -59
- B. -17
- C. 13
- D. 55
- E. 63

20. $(5x^3 - 4xy^2 + 12y) - (3y - 2x^3 - 4xy^2) = ?$

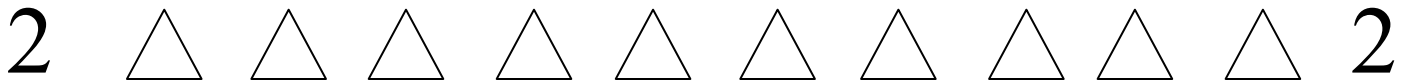
- F. $2x^3 - 2xy^2 + 16y$
- G. $7x^3 - 8xy^2 - 9y$
- H. $7x^3 - 8xy^2 + 15y$
- J. $7x^3 + 15y$
- K. $7x^3 + 9y$

21. A 60-foot-long rope is cut into three pieces. The longest piece is 4-feet longer than two times the length of the middle-sized piece. The shortest piece is half the length of the middle-sized piece. What is the length of the shortest piece?

- A. 7
- B. 8
- C. 10
- D. 11
- E. 16

22. Kyson was x years old 5 years ago. Which equation below will give the age he will be in 7 years?

- F. $(x - 5) + 7$
- G. $(x - 5) - 7$
- H. $(x + 7) - 5$
- J. $(x + 5) + 7$
- K. $(x + 5) - 7$



23. In the (x, y) coordinate plane, the endpoints of segment \overline{FG} are located at point F $(-2, 8)$ and point G $(6, 4)$. What is the midpoint of segment \overline{FG} ?

- A. $(2, 6)$
- B. $(4, 4)$
- C. $(-4, 6)$
- D. $(2, -4)$
- E. $(4, 6)$

24. What is the length of the line segment between point A located at $(-6, 2)$ and point B located at $(6, -5)$?

- F. $\frac{7}{12}$
- G. $\sqrt{168}$
- H. 13
- J. $\sqrt{193}$
- K. 14

25. In Scott's T-shirt drawer, there are 6 blue shirts, 4 green shirts, 1 purple shirt, and 7 red shirts. How many additional blue shirts must be added to the drawer so that the probability of randomly selecting a blue shirt is $\frac{1}{2}$?

- A. 2
- B. 4
- C. 6
- D. 8
- E. 10

26. The expression $\frac{5x^4 + (10xc^2d^3)^2 \cdot x^2}{5x \cdot x^3}$ is equivalent to:

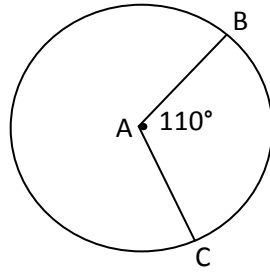
- F. $1 + 2c^4d^6$
- G. $1 + 10c^4d^6$
- H. $1 + 20c^4d^6$
- J. $5x^4 + 25x^4c^4d^6$
- K. $10x^4 + c^4d^6$

27. If $f(x) = \frac{4x+3}{3}$ and $g(x) = (3x^2 - 3)$, which of the following represents $f(g(x))$?

- A. $4x + 3$
- B. $4x^2 - 3$
- C. $12x^2 - 9$
- D. $12x^2 - 12$
- E. x^2

28. Circle A has an area of 81π . What is the length of arc BC?

- F. 5.5π
- G. 8π
- H. 24.75π
- J. 81π
- K. 324π



29. 150 people have tickets to attend the play at the community theater. The average age of the ticket holders is 48. If 30 additional tickets are purchased by a group of people with the average age of 30, what is the new average age of all 180 ticket holders?

- A. 37
- B. 39
- C. 42
- D. 45
- E. 47

30. Which of the following is equivalent to the expression $\sqrt[3]{a^6b^{12}c^9}$?

- F. $\sqrt{a^2b^4c^3}$
- G. $a^2b^4c^3$
- H. $a^{\frac{1}{2}}b^{\frac{1}{4}}c^{\frac{1}{3}}$
- J. $\sqrt{a^{\frac{1}{2}}b^{\frac{1}{4}}c^{\frac{1}{3}}}$
- K. abc

31. $4(x + 3) < 5(x - 3)$ is equivalent to which of the following inequalities?

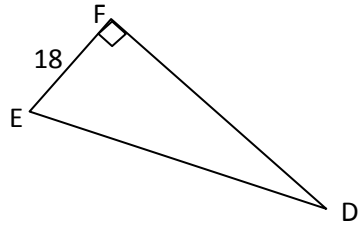
- A. $x > 27$
- B. $x < 27$
- C. $\frac{3}{5} < x < \frac{3}{4}$
- D. $12 < x < 15$
- E. $-15 < x < 12$

32. The original price of an airplane ticket is reduced by 50% for a sale. Then, this new sale price is increased by 50%. Finally, that price is increased by 10%. As a percentage of the original ticket price, what is the final price of the ticket?

- F. 57.5%
- G. 60%
- H. 77.5%
- J. 82.5%
- K. 110%

33. In triangle $\triangle DEF$ shown below, $\tan D = \frac{4}{9}$ and segment \overline{FE} measures 18 inches. To the nearest tenth of an inch, what is the measure of segment \overline{DF} ?

- A. 8
- B. 27
- C. 36.3
- D. 40.5
- E. 44.3

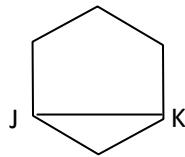


34. To get from Springfield to Stoneville, you drive 20 miles due west and 10 miles due north. To get from Springfield to Overton, you drive 6 miles due south and 10 miles due east. Assuming flat ground for all roads, if a new road took the shortest route from Stoneville to Overton, how long would it be?

- F. 30
- G. 34
- H. $3\sqrt{149}$
- J. $10\sqrt{26}$
- K. 51

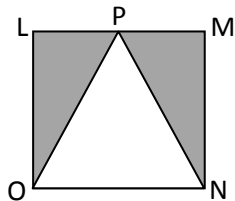
35. The regular hexagon below has 6 equal sides. How many degrees are in the figure above diagonal \overline{JK} ?

- A. 360
- B. 450
- C. 540
- D. 630
- E. 720



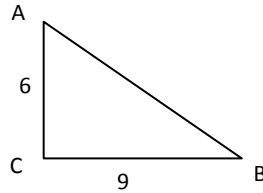
36. The sides of square LMNO are each 8 inches long. Point P is the midpoint of segment LM. What is the area of the shaded region?

- F. $16\sqrt{2}$
- G. $16\sqrt{3}$
- H. 32
- J. 48
- K. 64



37. For right triangle $\triangle ABC$ below, what is $\sin \angle B$?

- A. $\frac{2}{3}$
- B. $\frac{3}{2}$
- C. $\frac{6\sqrt{117}}{117}$
- D. $\frac{9\sqrt{117}}{9}$
- E. $\frac{6}{15}$



38. In a skateboarding race, Joe finished a 2.1 mile race in 3 minutes and 36 seconds. What was his average speed in miles per hour for the race?

- F. 35
- G. 47
- H. 65
- J. 97
- K. Cannot be determined from the information given.

39. The formula for computing the area of a trapezoid is $A = \frac{(b_1 + b_2) \cdot h}{2}$, where b_1 and b_2 are the bases and h is the height. Which of the following is an expression for b_1 ?

- A. $\frac{2A}{h} - b_2$
- B. $\frac{2A - b_2}{h}$
- C. $\frac{A}{2h} - b_2$
- D. $\frac{A - b_2}{2h}$
- E. $\frac{h}{2A} - b_2$

40. The side of a square is the same length as the diameter of a circle. If the area of the circle is 36π square units, what is the area of the square in square units?

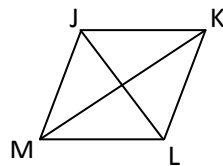
- F. 36
- G. 48
- H. 72
- J. 144
- K. 324

41. A set of five integers averages 27. If one of the integers in the set is 21, what is the average of the other four numbers in the set?
- A. 21
 - B. 27
 - C. 28.5
 - D. 29.5
 - E. 30.25

42. Steve is building a home theater room onto his house. The rectangular room is 4 feet longer than it is wide. The area of the room is 165 square feet. What is the width of the room?
- F. 10
 - G. 11
 - H. 14
 - J. 15
 - K. 16

43. If $x = -2$, $y = \frac{1}{2}$, and $z = -4$, what is the value of $\frac{4yz^2 - 2x}{y}$?
- A. 18
 - B. 34
 - C. 36
 - D. 72
 - E. 136

44. In Rhombus JKLM, if $JL = 8$ meters and $KM = 10$ meters, what is its area in square meters?



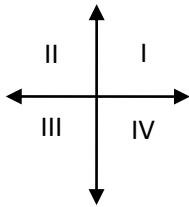
- F. 30
- G. 33
- H. 36
- J. 40
- K. 41

45. The volume of a square-based pyramid is given by $\frac{1}{3}l^2h$, where l is the length of a side of the base and h is the height of the pyramid. If l is doubled and h is quadrupled, how many times larger is the resulting pyramid than the original pyramid.
- A. 2
 - B. 4
 - C. 9
 - D. 10
 - E. 16

46. What is the value of $(\sin x + \cos x)^2 + (\sin x - \cos x)^2$?

- F. $\tan x$
- G. -1
- H. 0
- J. 1
- K. 2

47. In the standard (x, y) coordinate plane, triangle $\triangle DEF$ has vertices at $D(4, 1)$, $E(1, 4)$, and $F(1, 2)$. If a translation is performed on triangle $\triangle DEF$, where the value of each x coordinate is decreased by 3 and the value of each y coordinate is decreased by 5, the translated triangle occupies which of the following quadrants?



- A. Quadrant I only
- B. Quadrant II only
- C. Quadrant I and II
- D. Quadrant III only
- E. Quadrant III and IV

48. What is the value of $\log_9 729$?

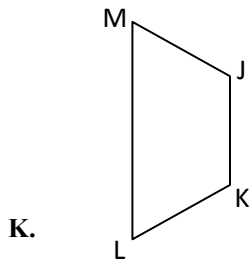
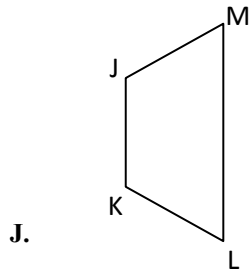
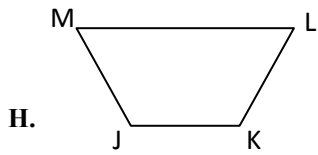
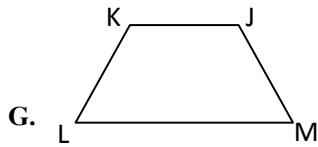
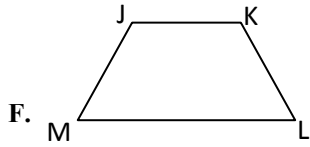
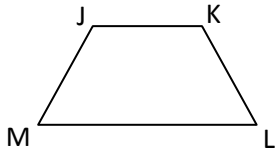
- F. 2
- G. 3
- H. 9
- J. 18
- K. 36

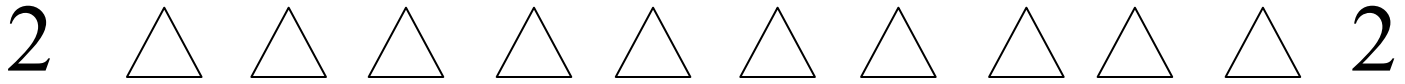
49. Given that the imaginary number i is defined as $i^2 = -1$, $i^{66} = ?$

- A. i
- B. -1
- C. $-i$
- D. 1
- E. Cannot be determined from the information given.

50. Interest can be calculated using the formula $I = prt$, where I equals the amount of interest earned, p equals the amount of the original investment, r equals the annual percentage yield the investment earned, and t equals the amount of time in years the money was invested. Linden invested \$2,000.00. After 15 months, her investment had grown to a total of \$2,125.00. The annual percentage yield of her investment is closest to which of the following?
- F. 4%
G. 5%
H. 6.25%
J. 8.5%
K. 9.75%
51. If you flip a quarter 12 times, what is the probability the coin will land on 'heads' all 12 times?
- A. $\frac{1}{2}$
B. $\frac{1}{12}$
C. $\frac{1}{24}$
D. $\frac{1}{12^2}$
E. $\frac{1}{2^{12}}$
52. If a and b are real numbers such that $3 \leq a \leq 9$ and $1 \leq b \leq 3$, then the minimum value for $\frac{a}{b}$ is:
- F. 0
G. $\frac{1}{3}$
H. 1
J. 3
K. 6
53. If $(x + y + z)^3 = x^3 + y^3 + z^3$, which of the following conditions make the statement true?
- I. $x, y,$ and z all equal zero
II. Two out of the three variables equal zero
III. Two of the variables are negative, one is positive
IV. Two of the variables are positive, one is negative
- A. I only
B. II only
C. III only
D. I and II
E. III and IV

54. If trapezoid JKLM is reflected over ML and then rotated 180° counterclockwise about point L , which of the following shows the final orientation of the trapezoid?





55. Given the function $2x^2 + 2x$, what is the value of $f(f(2))$?

- A. 168
- B. 202
- C. 288
- D. 312
- E. 512

56. Given that $0 \leq x \leq 2\pi$, which of the following values for x will create the greatest y in the equation $y = \sin 2x$?

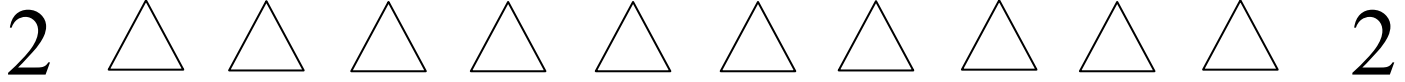
- F. 0
- G. $\frac{\pi}{2}$
- H. π
- J. $\frac{5\pi}{4}$
- K. 2π

57. Betty purchased loaves of bread for her restaurant. She always purchases in the same ratios. The ratio of wheat to rye is 6:2. The ratio of rye to white is 3:5. Assuming Betty's purchase followed these ratios and that she bought only whole loaves, what is the fewest number of loaves Betty could have purchased?

- A. 17
- B. 24
- C. 34
- D. 36
- E. 40

58. $\frac{\sin \theta (\sin^2 \theta + \cos^2 \theta)}{\cos \theta} = ?$

- F. $\frac{1}{2}$
- G. 1
- H. $\frac{1}{\tan \theta}$
- J. $\sin^3 \theta$
- K. $\tan \theta$



59. In a geometric sequence, the first term is 1 and the second term is x , what is the *fourth* term?
- A. z
 - B. xyz
 - C. x^2
 - D. x^3
 - E. $2x$
60. A total of s scouts went to summer camp at Camp Crystal Lake. Each of the c cabins could house up to g guests. If one cabin had 3 unoccupied beds and all the rest of the cabins were filled to capacity, which of the following equations accurately describes the relationship between c , s , and g ?
- F. $c + g - 3 = s$
 - G. $\frac{s}{c} - 3 = g$
 - H. $cg + 3 = s$
 - J. $sc - 3 = g$
 - K. $cg - 3 = s$

END OF SECTION 2
STOP! DO NOT TURN THE PAGE
UNTIL TOLD TO DO SO.

27 DO NOT RETURN TO THE PREVIOUS TEST.

JOHN BAYLOR
TEST • PREP



READING TEST

35 Minutes—40 Questions

DIRECTIONS: There are four passages in the following pages. Each passage is followed by ten questions that pertain to it. Choose the best answer to each of the questions based on what you have read in the passage. You may refer to the passages as often as you need.

PASSAGE I

PROSE FICTION: The following is an excerpt from *The Prince and the Pauper* by Mark Twain (originally published in 1881), in which a poor boy meets the Prince of Wales. Granddam means Grandmother.

Tom discovered Charing Village presently, and rested himself at the beautiful cross built there by a bereaved king of earlier days; then idled down a quiet, lovely road, past the great cardinal's stately palace, toward a far more mighty and majestic palace beyond—Westminster. Tom stared in glad wonder at the vast pile of masonry, the wide-spreading wings, the frowning bastions and turrets, the huge stone gateway, with its gilded bars and its magnificent array of colossal granite lions, and the other signs and symbols of English royalty. Was the desire of his soul to be satisfied at last? Here, indeed, was a king's palace. Might he not hope to see a prince now—a prince of flesh and blood, if Heaven were willing?

Poor little Tom, in his rags, approached, and was moving slowly and timidly past the sentinels, with a beating heart and a rising hope, when all at once he caught sight through the golden bars of a spectacle that almost made him shout for joy. Within was a comely boy, tanned and brown with sturdy outdoor sports and exercises, whose clothing was all of lovely silks and satins, shining with jewels; at his hip a little jeweled sword and dagger; dainty buskins on his feet, with red heels; and on his head a jaunty crimson cap, with drooping plumes fastened with a great sparkling gem. Several gorgeous gentlemen stood near—his servants, without a doubt. Oh! he was a prince—a prince, a living prince, a real prince—without the shadow of a question; and the prayer of the pauper-boy's heart was answered at last.

Tom's breath came quick and short with excitement, and his eyes grew big with wonder and delight. Everything gave way in his mind instantly to one desire: that was to get close to the prince, and have a good, devouring look at him. Before he knew what he was about, he had his face against the gate-bars. The next instant one of the soldiers snatched him rudely away, and sent him spinning among the gaping crowd of country gawks and London idlers. The soldier said, — "Mind thy manners, thou young beggar!"

The crowd jeered and laughed; but the young prince sprang to the gate with his face flushed, and his eyes

flashing with indignation, and cried out,—

40 "How dar'st thou use a poor lad like that? How dar'st thou use the King my father's meanest subject so? Open the gates, and let him in!"

You should have seen that fickle crowd snatch off their hats then. You should have heard them cheer, and shout, "Long live the Prince of Wales!"

The soldiers presented arms with their halberds, opened the gates, and presented again as the little Prince of Poverty passed in, in his fluttering rags, to join hands with the Prince of Limitless Plenty. Edward Tudor said—
50 "Thou lookest tired and hungry: thou'st been treated ill. Come with me."

Half a dozen attendants sprang forward to—I don't know what—interfere, no doubt. But they were waved aside with a right royal gesture, and they stopped stock still where they were, like so many statues. Edward took Tom to a rich apartment in the palace, which he called his cabinet. By his command a repast was brought such as Tom had never encountered before except in books. The prince, with princely delicacy and breeding, sent away the servants, so that his humble guest might not be embarrassed by their critical presence; then he sat near by, and asked questions while Tom ate.

"What is thy name, lad?" asked the Prince. "Tom Canty, an' it please thee, sir." "'Tis an odd one. Where dost live?" the Prince asked. "In the city, please thee, sir. Offal Court, out of Pudding Lane." "Offal Court! Truly 'tis another odd one," the Prince responded. "Hast parents?" "Parents have I, sir, and a grand-dam likewise—also twin sisters, Nan and Bet." The Prince thought a moment.

"Then is thy grand-dam not over kind to thee, I take it?" he asked at last. "Neither to any other is she, so please your worship. She hath a wicked heart, and worketh evil all her days." "Doth she mistreat thee?" asked the Prince. "There be times that she stayeth her hand, being asleep."

"Is thy father kind to thee?" the Prince asked. "Not more than Gammer Canty, sir." "Fathers be alike, mayhap," replied the Prince.

1. It can be inferred from the passage that Tom Canty most wants:
 - A. to dine at the palace.
 - B. to see a prince.
 - C. to find a new place to live.
 - D. to see Westminster Palace.
2. The description in the first paragraph (lines 1-13) suggests that Tom:
 - F. has heard of these places but never seen them before.
 - G. is lost in the city and trying to find his way back to Charing Village.
 - H. knows the prince well and has come to have lunch with him.
 - J. did not know that the palace would be protected by so many guards.
3. The reference to Tom's rags (line 14) helps the reader to know that:
 - A. Tom is searching for someone to give him money.
 - B. Tom will not be welcomed by the prince.
 - C. Tom is poor and seemingly out of place there.
 - D. Charing Village is a place of great poverty.
4. It can be inferred from the passage that watching the prince within the palace yard was:
 - F. unusual for the citizens of London.
 - G. a common activity among the people.
 - H. something Tom did every day.
 - J. a forbidden activity at the time.
5. As revealed in the passage, Prince Edward can best be characterized as :
 - A. arrogant and aloof.
 - B. confused and simple-minded.
 - C. sad and morose.
 - D. kind and attentive.
6. The Prince's response to Tom's description of his father (lines 78-79) indicates:
 - F. that the King can be harsh at times.
 - G. that he has never met anyone like Tom before.
 - H. that Tom's life is very different from his own.
 - J. that he doesn't believe Tom's account of his family.
7. How do the Prince's attendants respond to Tom's entry into the palace?
 - A. They immediately bring something for Tom to eat.
 - B. They leave to tell the King what is happening.
 - C. They attempt to stop the Prince from bringing him in.
 - D. They attend to Tom despite the Prince's objections.
8. As it is used in the passage, the word *repast* (line 57) most nearly means:
 - F. sumptuous meal.
 - G. encyclopedia.
 - H. wooden train.
 - J. regal robe.
9. Tom's response about whether his grandmother mistreats him in line 75-76 is an example of:
 - A. foreshadowing.
 - B. metaphoric speech.
 - C. symbolism.
 - D. sarcasm.
10. Why does the author describe the crowd outside the palace as "fickle" (line 43)?
 - F. Because they laughed when Tom was mistreated, but cheered when the Prince let him inside.
 - G. Because they cheered for the Prince of Wales when he appeared, even though they'd been mocking him earlier.
 - H. Because they became infuriated at the guards when they mistreated Tom.
 - J. Because they acted as though seeing the Prince was not significant, despite his title.

PASSAGE II

SOCIAL SCIENCE: The following is an article on the need for data deletion in regard to privacy issues, reprinted from an article published in the *Indiana Journal of Global Legal Studies*, Vol. 16, p. 363 (2009) by Benjamin J. Keele.

While the idea of a data deletion principle is not entirely novel, the international consensus that has coalesced around other data protection principles has not yet encompassed a deletion principle. Global data protection standards should cover the entire life cycle of information, up to and including the necessary destruction of personal information. Until a data deletion principle is adopted as an integral part of a data protection regime that protects privacy while permitting global data transfers, no data protection scheme will be complete.

With the advent of digital information storage and processing, personal information can be more easily collected, stored, transferred, and processed. This raises important privacy concerns. Data protection principles have been developed at the national and regional levels to allow for the use of personal data in beneficial ways while reducing the risk of abuse. A data deletion principle would help achieve these goals, but unlike many data protection principles, data deletion has not yet been generally accepted. Privacy and data protection implicate numerous social values and civil rights, including autonomy over one's body, freedom from unjustified searches, control over one's public persona, and privacy in one's personal thoughts.

Data protection principles seek to address one particular aspect of privacy: maintaining appropriate control over non-public data that relate to and identify a particular individual. Examples of such personal information include records of financial transactions, medical conditions, private online activities, and academic and employment histories. An appropriate balance must be struck between permitting economically beneficial and socially essential uses of personal data while preventing harm to data subjects and giving data subjects sufficient control to maintain a minimum degree of autonomy. Data protection principles generally regulate the collection, storage, transfer, and processing of personal data. These are important functions because as individuals' lives become more susceptible to recording and analysis, entities and institutions are more likely to use personal data to make important decisions.

Many important decisions about individuals are based upon their personal information. Most applications for credit cards, car loans, or mortgages are screened on the basis of personal information contained in credit bureau reports. Many employers run criminal background checks on prospective employees. Insurers check personal data before issuing insurance policies. It is clear that many essential tasks require the collection, storage, and analysis of individuals' personal information.

Bureaucratic decision-making processes are being exercised ever more frequently over a greater sphere of our lives, and we have little power or say within such a system, which tends to structure our participation along standardized ways that fail to enable us to achieve our goals, wants, and needs. Thus, while bureaucratic processing of personal data is necessary and even beneficial, it must be regulated to give individuals some measure of control over their personal information, thereby forcing data controllers to respect the individuals' autonomy and allowing the individual to participate in these important decision-making processes. Data protection principles (and, through modeling and harmonization, national data protection laws) can regulate data controllers to protect individual dignity and autonomy in the use of personal information.

Aside from allowing sufficient individual control in personal data processing, data protection principles also help reduce the risk of abuses of personal data. There are myriad ways in which personal information may be used to the severe detriment of data subjects, ranging from the financially crippling (fraud, identity theft, or insurance discrimination) to the relatively innocuous but irritating (unwanted telephone or mail solicitations). In addition to causing the loss of individuals' money, time, patience, or reputation, abuse of personal information also reduces individuals' confidence in the systems that utilize personal data, thus limiting the potential social benefits of such systems.

For example, widespread adoption of electronic health records, an innovation that could reduce health care costs and facilitate valuable medical research, has been slowed, in part, by disagreements over rules balancing patient privacy against beneficial uses of data. Data protection principles that help reduce the risk of these harms will protect data subjects' interests and increase confidence in legitimate and useful personal information systems. These perceived benefits have prompted several attempts to develop global data protection standards.

When there is a need for personal data, those data are collected, processed, transferred, and stored. Take the development of the credit reporting system. Lenders wanted a way to separate reliable borrowers from risky ones. By collecting the borrowing histories of potential clients, lenders could decide to whom to lend and at what interest rate. Credit reporting agencies collect information from creditors and process it (aggregating it into useful reports and producing credit scores), disclose it (sending credit reports about loan applicants to lenders), and store it for later use.

11. According to the passage, what conflict exists with the collection and storage of personal data?
- A. The benefits and necessity of data collection and the privacy rights of individuals.
 - B. The right of the government to use preferred processes and the need for easy data access.
 - C. The need for better collection of medical information and the rights of insurance companies.
 - D. The harmful use of data against individuals and the need for better policing strategies.
12. It can reasonably be inferred that a “data deletion principle” (line 1) would govern:
- F. how data is collected and stored within each individual country.
 - G. what specific rights to privacy individuals have.
 - H. under what circumstances personal data could be destroyed.
 - J. whether certain types of data can be collected and transferred.
13. The word *legitimate* as used in line 84 most nearly means:
- A. legal.
 - B. unwarranted.
 - C. appropriate.
 - D. personal.
14. According to the passage, what is the purpose of credit reporting systems?
- F. to distinguish reliable borrowers from risky ones.
 - G. to collect marketing information.
 - H. to discriminate based on income.
 - J. to determine federal interest rates.
15. The author gives which of the following as an example of an essential task that requires access to personal information?
- A. tracking driving trends and fuel usage
 - B. running criminal background checks
 - C. executing identity theft
 - D. tracking marketing trends
16. As a whole, the passage is best described as:
- F. a moral defense of the collection and storage of personal information.
 - G. an account of specific ways in which personal information is used.
 - H. a study of the history of the data protection principles around the world.
 - J. a discussion of the pros and cons of data collection and the need for protective guidelines.
17. The main idea of the fifth paragraph (lines 48-63) is that:
- A. data protection principles will increase the risk of abuses of personal data.
 - B. individuals have less control over their own data despite the vast bureaucracy that has grown up around data collection.
 - C. some amount of bureaucracy is to be expected in the collection and storage of data and must be tolerated.
 - D. individuals can retain autonomy over their data by constantly challenging processes already in place.
18. The author lists all of the following as harmful effects of data collection EXCEPT:
- F. vote tampering.
 - G. identity theft.
 - H. insurance discrimination.
 - J. unwanted solicitations.
19. As it is used in the passage, the word *coalesced* (line 2) most nearly means:
- A. united.
 - B. explained.
 - C. reiterated.
 - D. objected to.
20. According to the passage, what is the purpose of data protection principles?
- F. to give individuals control over data that relate to their identities.
 - G. to determine how data is processed and transferred between agencies.
 - H. to aid law enforcement in investigating cases of identity theft.
 - J. to deal with the huge amount of data that is collected and stored each year.

PASSAGE III

HUMANITIES: The following passage focuses on the history of the British postal system and is excerpted from an essay entitled “Mail” included in the collection *At Large and At Small* by Anne Fadiman, ©2007.

We get what we need. In 1680, London had mail service nearly every hour because there were no telephones. If you wished to invite someone to tea in the afternoon, you could send him a letter in the morning and receive his reply before he showed up at your doorstep. Postage was one penny.

If you wished to send a letter to another town, however, delivery was less reliable and postage was gauged on a scale of staggering complexity. By the mid-1830s, “the postage on a single letter delivered within eight miles of the office where it was posted was . . . twopence, the lowest rate beyond that limit being fourpence. Beyond fifteen miles it became fivepence; after which it rose a penny at a time, but by irregular augmentation, to one shilling, the charge for three hundred miles. . . . There was as a general rule an additional charge of a half-penny on a letter crossing the Scotch border; while letters to or from Ireland had to bear, in addition, packet rates, and rates for crossing the bridges over the Conway and the Menai.”

So wrote Rowland Hill, the greatest postal reformer in history, who in 1837 devised a scheme to reduce and standardize postal rates and to shift the burden of payment from the addressee to the sender.

Until a few years ago, I had no idea that if you sent a letter out of town—and if you weren’t a nobleman, a member of Parliament, or some other VIP who had been granted the privilege of postal franking—the postage was paid by the recipient.

Hill had grown up poor, and, as Christopher Browne notes in *Getting the Message*, his splendid history of the British postal system, “Hill had never forgotten his mother’s anxiety when a letter with a high postal duty was delivered, nor the time when she sent him out to sell a bag of clothes to raise 3s for a batch of letters.”

Thirty years later, he published a report called “Post Office Reform: Its Importance and Practicability.” Why, he argued, should legions of accountants be employed to figure out the byzantine postal charges? Why should Britain’s extortionate postal rates persist when France’s revenues had risen, thanks to higher mail volume, after its rates were lowered? Why should postmen waste precious time waiting for absent

addressees to come home and pay up? A national Penny Post was the answer, with postage paid by the senders, “using a bit of paper . . . covered at the back with a glutinous wash, which the bringer might, by the application of a little moisture, attach to the back of the letter.”

After much debate, Parliament passed a postal reform act in 1839. On January 10, 1840, Hill wrote in his diary, “Penny Postage extended to the whole kingdom this day! . . . I guess that the number dispatched to-night will not be less than 100,000, or more than three times what it was this day twelve-months. If less I shall be disappointed.” On January 11, he wrote, “The number of letters dispatched exceeded all expectation. It was 112,000, of which all but 13,000 or 14,000 were prepaid.” On May 6, the Post Office introduced the Penny Black, a gummed rectangle, printed with lampblack in linseed oil, that bore the profile of Queen Victoria: the first postage stamp. The British press, pondering the process of cancellation, fretted about the untoward disfiguration of the royal person,” but Victoria became an enthusiastic philatelist who waived the royal franking privilege for the pleasure of walking to the local post office from Balmoral Castle to stock up on stamps and gossip with the postmaster. When Rowland Hill—by that time *Sir* Rowland Hill—retired as Post Office Secretary in 1864, a *Punch* cartoon was captioned, “Should Rowland Hill have a statue? Certainly, if Oliver Cromwell should. For one is celebrated for cutting off the head of a bad King, and the other for sticking on the head of a good Queen.”

And yet (to raise a subversive question), might it be possible that, whatever the benefit in efficiency, there may have been a literary cost associated with the conversion from payment by addressee to payment by sender? If you knew that your recipient would have to bear the cost of your letter, wouldn’t courtesy motivate you to write an extra good one? On the other hand, if you paid for it yourself, wouldn’t you be more likely to feel you could get away with “Having a great time, wish you were here”?

21. Based on the information in the first paragraph (lines 1-6), with which of the following statements would the author of the passage be LEAST likely to agree?
- A. Postage in London was swift and easy.
 - B. The reason there was postage every hour was that it was the most efficient means of communication with people beyond shouting distance.
 - C. The postal system in London was comprehensive.
 - D. Residents of London were probably the inspiration for reform.
22. Which of the following best expresses the “staggering complexity” of the postal system before it was reformed?
- F. The routes were irregular and a different postal carrier could arrive at your door every day.
 - G. The rates were devised with complex guidelines and were difficult to calculate.
 - H. The addresses in England were constantly changing with changing rulers.
 - J. Parliament kept introducing new stamp taxes that kept the rates irregular.
23. The word *augmentation* (line 15) refers to
- A. increases in rates based on distance.
 - B. the addition of accountants to calculate rates.
 - C. the additional prices levied by other countries.
 - D. the reform of the system to the penny post.
24. Based on information in the passage, Rowland Hill:
- F. was a member of Parliament.
 - G. wanted addressees to continue paying.
 - H. invented the modern stamp.
 - J. wanted rates to be calculated by distance.
25. Which of the following arguments for reform did Rowland Hill NOT present in his report?
- A. Many accountants were required to figure out national postal rates.
 - B. When France dropped their postal rates, usage soared and revenues increased.
 - C. New stamps could create the new hobby of collection and exhibition.
 - D. Postal workers had to wait for addressees to collect the postal charge.
26. Why does the author lament the postal reforms of Rowland Hill?
- F. She enjoys collecting old stamps that existed before the reforms.
 - H. She thinks it unfair that the sender should pay for a letter.
 - G. She was unaware that recipients had to pay for letters before Rowland Hill.
 - J. She believes the art of letter writing may have been diminished by the reforms.
27. It can be inferred from information in the seventh paragraph that the “process of cancellation” (line 63) involved:
- A. marking the stamp used.
 - B. adding more postage.
 - C. notifying the queen.
 - D. delivering the letter.
28. According to the passage, what aspect of the postal system had most inspired Rowland Hill to reform it?
- F. The fact that Londoners had an easier system than rural towns.
 - G. The fact that postage was paid by the recipient.
 - H. The fact that no stamps were required to send a letter.
 - J. The fact that postal carriers had to wait for the addressee to come home.
29. As it is used in the passage, the word *byzantine* (line 40) most nearly means:
- A. efficient.
 - B. complex.
 - C. resplendent or regal.
 - D. quixotic.
30. It can be reasonably inferred from the passage that the act of “franking” (line 66) was:
- F. using the postal service for free.
 - G. using more stamps than necessary.
 - H. having stamps delivered to your home.
 - J. talking to the post master about modern affairs.

PASSAGE IV

NATURAL SCIENCE: The following passage focuses on how summer reading and stereotypes affect learning. The passage was written by Benjamin Wiese (©2010).

A complete intellectual shutdown over the summer can be detrimental to the reading comprehension skills necessary for future learning. Equally important to academic achievement is the mindset of students. Both positive and negative stereotypes have real impact on how students evaluate their abilities and on their actual learning outcomes.

Professors Richard Allington and Anne McGill-Frantzen conducted a three-year study from 2001-2004 at the University of Tennessee-Knoxville. They demonstrated that students engaged in summer reading have a significantly higher reading achievement level than those without access to books. The researchers concluded that this activity is the primary reason for the current reading achievement gap.

“Just like hockey players lose some of their skills if they stay off their skates and off the ice for three months, children who do not read in the summer lose two to three months of reading development,” Allington stated, “while kids who do read tend to gain a month of reading proficiency. This creates a three to four month gap every year.”

This study differed from those conducted by others in the same field. These studies focused only on a one-year period, generally finding no material increase or decrease in reading level. The Tennessee three-year study allowed for a broader view into summer reading’s effect on students. “Every two to three years the kids who don’t read in the summer fall a year behind the kids who do,” Allington said.

Academic achievement is earned through a complicated process, intertwining basic skills and the psychological state of young minds. Mindset is a key factor in student success, and stereotypes have been found to play a major role in this area.

A University of Chicago study involving 17 teachers, 52 boys, and 65 girls, investigated the effect of a teacher subconsciously reinforcing a negative stereotype on student performance. The researchers found that math performance by boys was unrelated to their teacher’s math anxiety. Girls, however, were affected adversely by their teacher’s uncertainty with math. The study concluded that this adverse effect on female confidence with math occurred because teacher anxiety reinforced the ‘women lack ability in math’ stereotype—a myth completely unfounded in other research.

“Having a highly math-anxious female teacher may push girls to confirm the stereotype that they are not as good as boys at math, which in turn, affects girls’ math achievement,” said Sian Beilock, the lead researcher. Girls exposed to an environment that fostered the stereotype of boys outperforming girls in math scored a 102 on a math achievement test, versus a score of 108 for the control group.

Another study, led by Dr Robert Rydell at the Indiana University, determined that stereotypes affect more than student performance – they cripple learning itself.

“The effect on learning could be cumulative. If women do not learn relatively simple skills early on, this could spell trouble for them later when they need to combine a number of simple skills in new, complicated ways to solve difficult problems,” Rydell said.

Each test within the Indiana study involved Chinese characters and color judgment tasks with two separate groups: women in the control group and women in the stereotype threat group. The researchers discovered that when women were reminded of the negative stereotypes involving women’s math and visual processing ability, no learning occurred. This group tried too hard to overcome the stereotype. Group members searched for the characters in an extremely focused, yet unproductive way, instead of simply letting the figures “pop out.”

But Rydell may have found a cure to this problem. In a series of four experiments involving between 57 and 112 college students, individuals were found to focus on a positive stereotype when presented with both negative and positive models, yielding improved results.

“People seem motivated to align themselves with positively stereotyped groups and, as a byproduct, can eliminate the worry, stress, and cognitive depletion brought about by negative performance stereotypes, increasing actual performance.”

Studies on summer reading and stereotypes have shown that effort and attitude correlate with achievement. The primary means to learning are a strong will and self-belief.

31. The author's description of the University of Tennessee study (lines 8-15) strongly supports the assertion that reading achievement:
- A. should be measured by academic years.
 - B. is influenced by students' access to books and willingness to read during vacations.
 - C. is affected by negative stereotypes.
 - D. is adversely affected by the length of summer vacation.
32. It can be inferred from the passage that the "reading achievement gap" (line 15) is:
- F. an inability to perform well on tests.
 - G. the effect of student stereotypes.
 - H. the difference in reading ability between students.
 - J. a measurement of reading ability based on performance.
33. The passage supports all of the following statements EXCEPT:
- A. negative stereotypes affect student performance.
 - B. educational studies can be an effective tool.
 - C. lack of summer reading causes kids to fall behind.
 - D. teaching methods in reading contribute greatly to student success.
34. The stereotyped learners mentioned in paragraph ten (lines 65-74) are most analogous to:
- F. a person who discovers they have a hidden gift that they have never used before.
 - G. an athlete overcompensating for an alleged shortcoming and making mistakes because of it.
 - H. an artist who allows the music to simply flow rather than trying to control it.
 - J. a child who finds a task impossible and refuses to perform.
35. The author mentions the importance of the student mindset in academic success (lines 33-35) in order to:
- A. argue that the psychology of reading is important.
 - B. dispute the claim that stereotypes exist in education.
 - C. claim that teaching methods are the primary determinant in educational outcomes.
 - D. introduce data showing that stereotyping affects educational outcomes.
36. Based on information in the sixth paragraph (lines 36-47), which of the following would be the best example of a teacher subconsciously reinforcing a negative stereotype?
- F. A female teacher who always calls on boys to answer math questions.
 - G. A male math teacher who is new and unsure of his skills.
 - H. A female math teacher who is confident in her ability to teach the subject.
 - J. A math class where girls were chosen to perform complex problems in front of the class.
37. As it is used in the passage, the word *cripple* (line 58) most nearly means:
- A. physically injure.
 - B. impede.
 - C. enable.
 - D. mentally challenge.
38. Based on the information in paragraph four (lines 23-30), the University of Tennessee study was superior to other studies because it:
- F. determined that there was a reading achievement gap.
 - G. was funded by educators in the field.
 - H. focused on a three year period rather than a one year period.
 - J. focused exclusively on summer reading habits.
39. With which of the following statements would the author of the passage agree?
- A. Exposure to stereotypes, positive and negative, affects performance outcomes.
 - B. Negative stereotypes cannot be overcome and must be avoided.
 - C. Educators never take students' mindsets into account.
 - D. Educational studies do not yield reliable results.
40. The author's primary purpose in the passage is to:
- F. discuss, through empirical studies, different habits and mindsets that affect student achievement.
 - G. argue that educators are using stereotypes in order to affect test scores.
 - H. state that the mindset of students is exaggerated as an indicator of student success.
 - J. refute the idea that educators should use stereotypes in their classrooms.

END OF SECTION 3

**STOP! DO NOT TURN THE PAGE
UNTIL TOLD TO DO SO.**



SCIENCE TEST

35 Minutes—40 Questions

DIRECTIONS: This test consists of seven passages. Questions follow each passage. Choose the best answer from among the choices given and fill in the corresponding oval on your answer sheet.

Passage I

In the full electromagnetic spectrum, waves vary greatly in length and frequency. Radio waves, which can measure up to many miles, are approximately 10 million times longer than visible light rays, which are 10 million times longer than gamma rays. How we use the waves is indicative of these characteristics. For instance, television, AM/FM broadcasts, and short-wave signals are types of radio waves that can travel long distances.

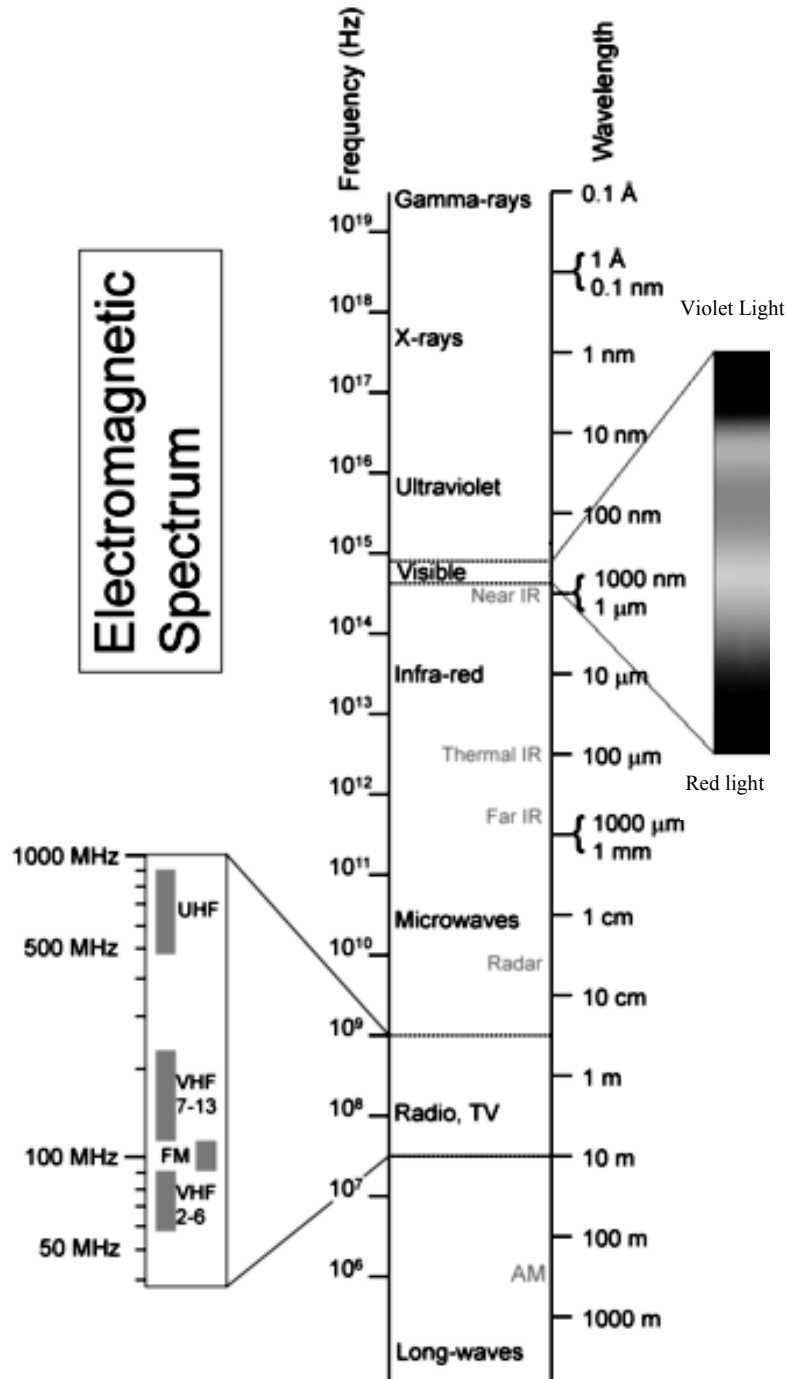
Visible light rays are composed of several waves at different wavelengths. White light can be refracted through a prism to display the different color components of the light. Each color band represents a distinct wavelength. Figure 1 below depicts the wavelengths (cm) and frequencies (cycles/second) of some common waves.

Table 1 below lists equivalent speeds of wavelengths on the chart.

Table 1

1 Å	= 1×10^{-10} meters per second
1 nm	= 1×10^{-9} meters per second
1 μm	= 1×10^{-6} meters per second
1 mm	= 1×10^{-3} meters per second
1 cm	= 1×10^{-2} meters per second

Figure 1



- According to Figure 1, between which of the following frequencies do television waves fall?
 - 10^7 and 10^9 Hz
 - 10^{10} and 10^{11} Hz
 - 10 m and 1 m
 - 100 m and 10 m
- An unknown wave has been detected in space. It is traveling at 1×10^{-9} meters per second. According to Table 1 and Figure 1, what type of electromagnetic wave might it be?
 - ultraviolet light
 - infrared light
 - a microwave
 - an x-ray
- According to Figure 1, which frequency falls within the range used by most FM radio stations?
 - 50 MHz
 - 1000 MHz
 - 100 MHz
 - 500 MHz
- According to Table 1 and Figure 1, how fast do microwaves travel?
 - 1×10^{-10} meters per second
 - 1×10^{-2} meters per second
 - 1×10^{-9} meters per second
 - 1×10^{-3} meters per second
- According to Figure 1, which of the following best describes the relationship between frequency and wavelength?
 - The higher the frequency, the longer the wavelength.
 - The wavelength and the frequency are directly proportional.
 - There is no relationship between wavelength and frequency.
 - The higher the frequency, the shorter the wavelength.
- Waves traveling at shorter wavelengths and higher frequencies are more harmful to the human body. Given that this is true, according to Figure 1, which is the most dangerous wave listed?
 - long-waves
 - microwaves
 - gamma-rays
 - ultraviolet waves

Passage II

Colony Collapse Disorder (CCD) is the name given to the phenomenon of honey bees disappearing from their hives. Many bee farmers have found that hundreds of living, active hives are suddenly devoid of bees, even though larvae and eggs remain intact. In a healthy hive, 10% to 20% of the bees originally within the hive can be absent. This attrition generally peaks in the winter.

Several possible causes have been proposed as the reason for CCD. One theory postulates that a *neonicotinoid*, or nicotine-based pesticide, attacks a bee’s nervous system, causes memory loss, and makes it impossible for the bee to find its way back to the hive once it has left. Another theory is that the *Israeli Acute Paralysis Virus* (IAPV) kills bees once they have left the hive. A third theory states that bee farmers, who transport bees long distances to various crop fields, have caused undue stress to the bees, causing them to die.

Experiment 1

A group of environmental students decided to determine which theory was correct. They obtained two live, healthy hives and placed each in a field of identical vegetation away from the other hives to avoid cross contamination. On Day One, Hive #1 was the control hive and was left alone. The bees in this hive were not exposed to anything unusual in their environment. Hive #2 was sprayed with a neonicotinoid. The remaining bees in the hive were counted over a period of five days. The results are shown in Table 1.

Table 1

	Initial Count	Day 1	Day 2	Day 3	Day 4	Day 5
Hive 1	1, 200	1,099	943	822	704	651
Hive 2	1, 200	987	1,089	502	332	159

Experiment 2

The students decided to add a third hive of 1,200 bees which they exposed to IAVP. In this experiment, Hive #1 was a control hive of 1,200 bees. Hive #2, also consisting of 1,200 bees, was sprayed with a neonicotinoid. Hive #3, beginning with the same number of bees, was exposed to IAVP. All three hives were kept completely separated in fields of identical flora. The results of the study are shown in Table 2.

Table 2

	Day 1	Day 2	Day 3	Day 4	Day 5
Hive 1	1,200	1,045	951	712	599
Hive 2	1,200	901	765	511	220
Hive 3	1,200	887	523	120	0

Experiment 3

Students added a fourth hive to test the theory that bees were being over stressed. All four hives were healthy and began with 1,200 bees. Hive #1 was a control. Hive #2 was again sprayed with a neonicotinoid. Hive #3 was exposed to IAVP. Hive #4 was transported by truck 200 miles to its field. The bees returning to the hive were again counted over the course of five days. The results are shown in Table 3.

Table 3

	Day 1	Day 2	Day 3	Day 4	Day 5
Hive 1	1,200	1, 101	903	882	641
Hive 2	1,200	889	701	564	190
Hive 3	1,200	875	499	98	0
Hive 4	1,200	1,115	1,003	855	603

7. Based on the results of all three experiments, which of the following was the greatest contributing factor to Colony Collapse Disorder?
 - A. neonicotinoids
 - B. IAVP
 - C. stress
 - D. cross contamination

8. Students realized that there was a possibility that some of the fields they used may have been previously sprayed with a pesticide, skewing the results of their experiments. What further control could they place on their experiment that would remove this variable?
 - F. increase the number of bees
 - G. add a hive that is contained indoors as a control
 - H. use the same field in each experiment, rotating hives
 - J. decrease the number of hives

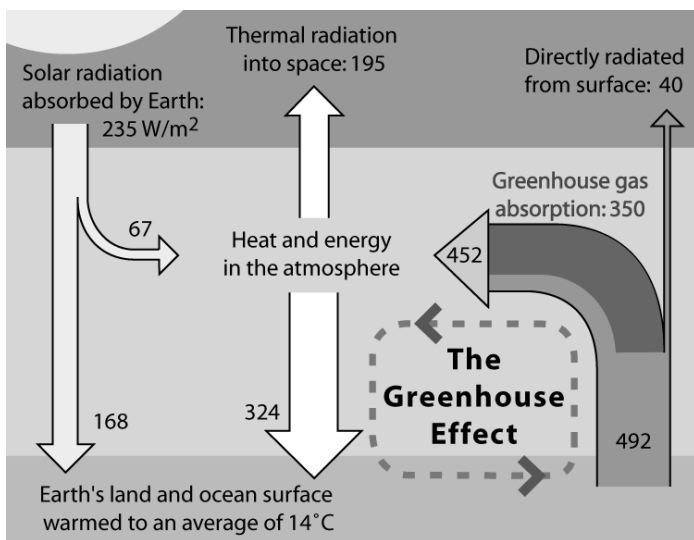
9. The data collected from Experiment 1 shows that:
- A. neonicotinoids have no effect on bees.
 - B. neonicotinoids have a minimal effect on bees.
 - C. neonicotinoids are a significant contributing factor to Colony Collapse Disorder.
 - D. neonicotinoids are the only cause of Colony Collapse Disorder.
10. Based on the data from Experiment 3, in the hive subject to IAVP, how many bees returned to the hive on day four when the bees were counted?
- F. 98
 - G. 499
 - H. 564
 - J. 882
11. The purpose of the control hive in all three experiments was to:
- A. prove that Colony Collapse Disorder does not exist.
 - B. show that neonicotinoids are the primary cause of CCD.
 - C. determine if the fields used were safe for the bees.
 - D. measure the hive activity in a normal environment.
12. The students have determined that many factors work together to contribute to Colony Collapse Disorder. Is this conclusion supported by the data?
- F. Yes, because the number of bees declined in every hive in each experiment.
 - G. Yes, because only the control hive maintained its numbers over time.
 - H. No, because IAVP reduced a colony's bee count to zero over four days.
 - J. No, because neonicotinoids were introduced in all three experiments.
13. Based on the experimental data, which of the following conclusions is the most supported?
- A. IAVP is the only cause of Colony Collapse Disorder.
 - B. Bees rarely abandon hives naturally without any cause.
 - C. Some of the contributing factors to Colony Collapse Disorder remain unknown.
 - D. Neonicotinoids do not play a role in Colony Collapse Disorder.

Passage III

Both the Earth and the Sun emit electromagnetic radiation (e.g. light) which can be predicted based solely on their respective temperatures. For the sun, these emissions peak in the visible region and correspond to a temperature of approximately 5500 Kelvin. Emissions from the Earth vary following variations in temperature across different locations and altitudes but always peak in the infrared.

Figure 1 is a simplified, schematic representation of the flows of energy between space, the atmosphere, and the Earth's surface and shows how these flows combine to trap heat near the surface and create the greenhouse effect.

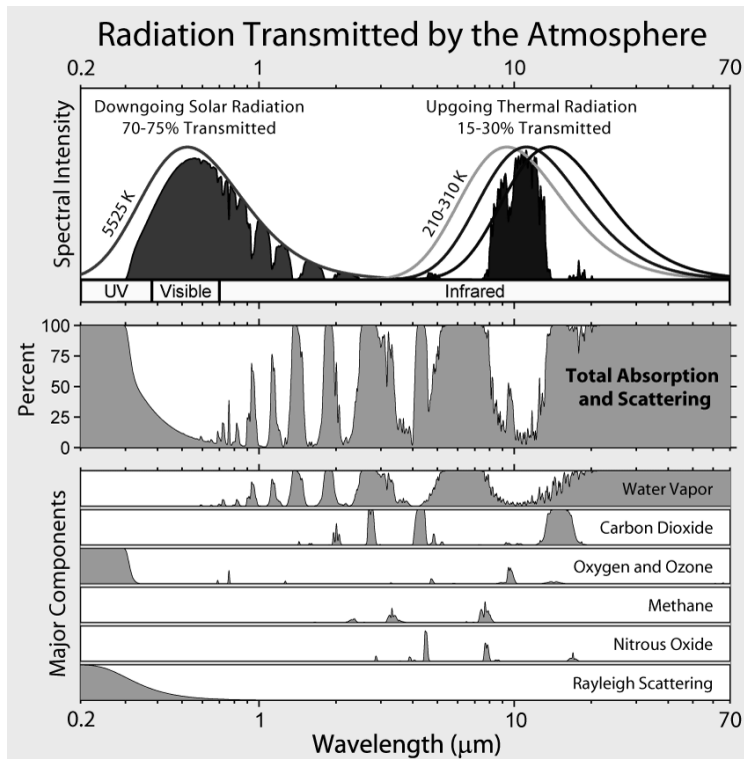
Figure 1



The position and number of absorption bands are determined by the chemical properties of the gases present. In the present atmosphere, water vapor is the most significant of these greenhouse gases, followed by carbon dioxide and various other minor greenhouse gases. In addition, *Rayleigh scattering*, the physical process that makes the sky blue, also disperses some incoming sunlight. Collectively these processes capture and redistribute 25-30% of the energy in direct sunlight passing through the atmosphere. By contrast, the greenhouse gases capture 70-85% of the energy in up-going thermal radiation emitted from the Earth surface.

Figure 2 shows the absorption bands in the Earth's atmosphere (middle panel) and the effect that this has on both solar radiation and up-going thermal radiation (top panel). Individual absorption spectrum for major greenhouse gases plus Rayleigh scattering are shown in the lower panel.

Figure 2



14. According to Figure 2, which greenhouse components absorb the shortest radiation wavelengths?
 - F. Oxygen and Ozone, and Rayleigh Scattering
 - G. Nitrous Oxide and Carbon Dioxide
 - H. Water Vapor, Methane, and Nitrous Oxide
 - J. Rayleigh Scattering and Water Vapor
15. Which of the following absorb the least radiation?
 - A. Methane and Nitrous Oxide
 - B. Water Vapor and Methane
 - C. Oxygen and Ozone
 - D. Carbon Dioxide and Nitrous Oxide
16. According to the information in the passage, which absorbs the most radiation?
 - F. carbon dioxide
 - G. Rayleigh Scattering
 - H. water vapor
 - J. nitrous oxide

17. According to Figure 2, 100% of thermal radiation absorption and scattering occurs:

- A. within the UV spectrum of light.
- B. at a wavelength of $70 \mu\text{m}$
- C. because of Methane gas.
- D. in space at 5525K.

18. Which of the following conclusions can be drawn from Figure 1?

- F. Almost all the radiation absorbed by Earth is returned to space.
- G. 235 W/m^2 of solar radiation is sufficient to heat the Earth's surface to 14°C .
- H. Greenhouse gases absorb very little of the Earth's upgoing radiation.
- J. Greenhouse gases are emitted from space and enter the atmosphere of Earth.

19. According to Figure 2, downgoing solar radiation that is transmitted to Earth is primarily:

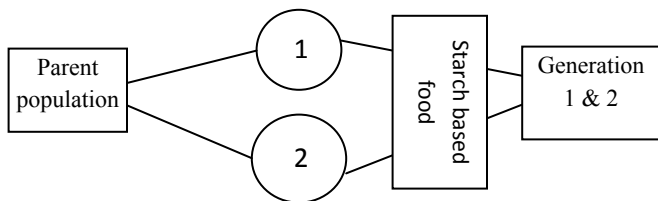
- A. in the infrared spectrum.
- B. returned to space in upgoing radiation.
- C. within the visible spectrum of light.
- D. absorbed by Rayleigh Scattering.

Passage IV

Speciation is the evolutionary process by which new species arise. There are four modes of speciation based upon geographic proximity of the parent species. One type, *allopatric* speciation, occurs when biological populations of the same species are completely isolated from one another. The isolated populations may diverge from each other genetically because they are subjected to different pressures, they independently undergo genetic drift, or different mutations arise in the populations' gene pools. The separate populations may evolve distinct characteristics. If the two populations are later reunited, members of the two populations may be unable to mate with each other successfully. This would indicate that the isolated groups have emerged as distinct species.

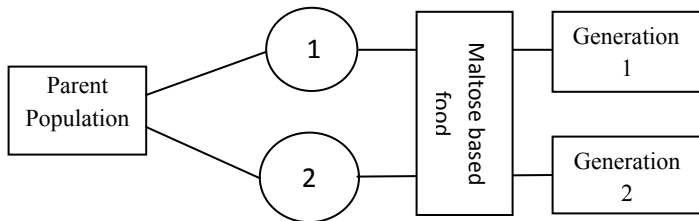
Experiment 1

A single population of fruit flies was divided into two groups. Both groups were fed a starch-based food while they were separated from one another for many generations. The groups were then mixed together again. It was found that the flies mated randomly without regard to the original generation. The results are shown in Figure 1.



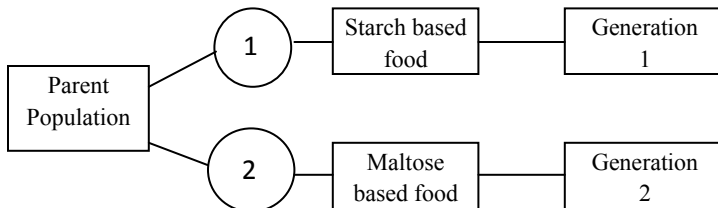
Experiment 2

A single population of fruit flies was divided into two groups. Both groups were fed a maltose-based diet while they were separated from one another for many generations. The groups were then mixed together again. It was found that the flies preferred to mate with flies from the same original group.



Experiment 3

A single population of fruit flies was divided into two, with one of the populations fed with starch-based food and the other with maltose-based food. After the populations were separated over many generations, they were brought back together. It was found that the flies preferred to mate with flies from the same original group.



20. In which experiment(s) did the food fed to the flies have no bearing on ultimate mating patterns?
- F. Experiment 2 & 3
 - G. Experiment 1
 - H. Experiment 3
 - J. Experiment 1, 2, and 3
21. Biologists in these experiments wanted to determine if the species of fruit fly used in the experiment is prone to avoid members of its species that have lost their distinctive scent. Based on this information, which of the following conclusions can be drawn from the experimental data?
- A. The biologists randomly selected two species of fruit fly in order to determine if one was affected by food intake.
 - B. The biologists believed that separating and adjusting food intake may affect the scent given off by fruit flies.
 - C. The biologists had already done a control experiment in which different foods yielded different results.
 - D. The biologists thought that feeding fruit to the fruit flies would change their scent.
22. Biologists in these experiments have become concerned that the starch-based food used in this experiment had become tainted and that the bacteria which tainted the food is the cause of the results of their experiments. How can they test to see if this is the case?
- F. Repeat Experiment 3 using new starch-based food.
 - G. Conduct a new experiment that utilizes the original starch-based food, the maltose-based food, and a third food.
 - H. Repeat Experiment 1 twice, once using the original starch-based food and once using a new supply of starch-based food.
 - J. Conduct all three experiments again using a new species of fruit fly and a fresh supply of both starch-based and maltose-based food.

23. What was the purpose of dividing the population into two for several generations before reintroducing them to one another?
- A. to determine if separation resulted in evolution
 - B. to determine if different fruit fly species would intermate
 - C. to determine if food supply would result in allopatric speciation
 - D. disprove that various food supplies were related to mating habits
24. Which of the following hypotheses do the experimental data best support?
- F. Feeding fruit flies different foods after separation results in allopatric speciation.
 - G. Starch-based food intake results in a loss of species identification among fruit flies.
 - H. Maltose-based food intake results in allopatric speciation in fruit flies.
 - J. Maltose-based food intake causes fruit flies to mate indiscriminately.

Passage V

There are typically two situations which cause soil erosion. One is when the intensity of the rainfall exceeds the *infiltration rate*, or rate at which the soil can absorb water. The other is when the soil surface becomes saturated with water and the rainfall intensity exceeds the *percolation*, or flow through the soil. In the second instance, there will be a downward or lateral movement of the seepage soil.

There are several ways in which to measure soil erosion. In the *reconnaissance method*, changes in soil surface at the point of soil loss are measured. The *volumetric method*, involves three-dimensional observations of soil run-off, typically when it is caught by a reservoir.

Study 1

Four 1m² erosion plots were designated in locations with different land use types: (1) on bare soil in a blueberry bush grove; (2) in an overgrown meadow; and (3) in a forest. The erosion plots in the forest were placed on soil with two different slopes: 8° and 21°. The reconnaissance method was used during two years on the plots to determine the amount of soil erosion in each region after an erosive event. The results are shown in Table 1.

Table 1

Unit	Year	Bare soil (blueberry bush)	Overgrown meadow	Forest slope of 8°	Forest slope of 21°
mm/m ²	2008	5.320	0.09	0.101	0.102
mm/m ²	2009	7.012	0.10	0.116	0.118

Study 2

Scientists repeated experiment 1 using the volumetric method. Reservoirs were built at the point of greatest seepage collection. Run off was collected and heated to 105°C in the laboratory where the concentration of undissolved particles was determined. The results are shown in Table 2.

Table 2

Unit	Year	Bare soil (blueberry bush)	Overgrown meadow	Forest slope of 8°	Forest slope of 21°
kg/m ²	2008	8.433	0.102	0.136	0.192
kg/m ²	2009	10.129	0.064	0.094	0.107

25. Based on the data from the studies, which of the following factors makes the greatest contribution to soil retention during erosive events?
 - A. a steep land slope
 - B. a coverage of meadow plants
 - C. bushy plants over bare soil
 - D. a coverage of trees

26. It was originally hypothesized that increased slope dramatically affects the level of erosion during a rainfall. Do the data support this conclusion?
 - F. Yes, because the forest with a 21° slope suffered the worst soil loss.
 - G. Yes, because the forest with a slope of 21° lost more soil than that of the forest with a slope of 8°.
 - H. No, because the forest with a slope of 21° had only a slightly higher soil loss than the forest with a slope of 8°.
 - J. No, because the greatest soil loss was suffered by the bare soil in the blueberry bush grove.

27. At a forest slope of 12°, which result would be expected in 2009 using the volumetric method?
 - A. .086
 - B. .090
 - C. .097
 - D. .117

28. What was the purpose in heating the seepage samples in Study 2?
 - F. to remove water before weighing
 - G. to purify the soil
 - H. to decrease the weight
 - J. to remove plant debris

29. According to the data, which type of plant coverage results in the greatest erosion?
 - A. steep forested slopes
 - B. slightly sloped forests
 - C. dense small plant life
 - D. bare soil with occasional bushes

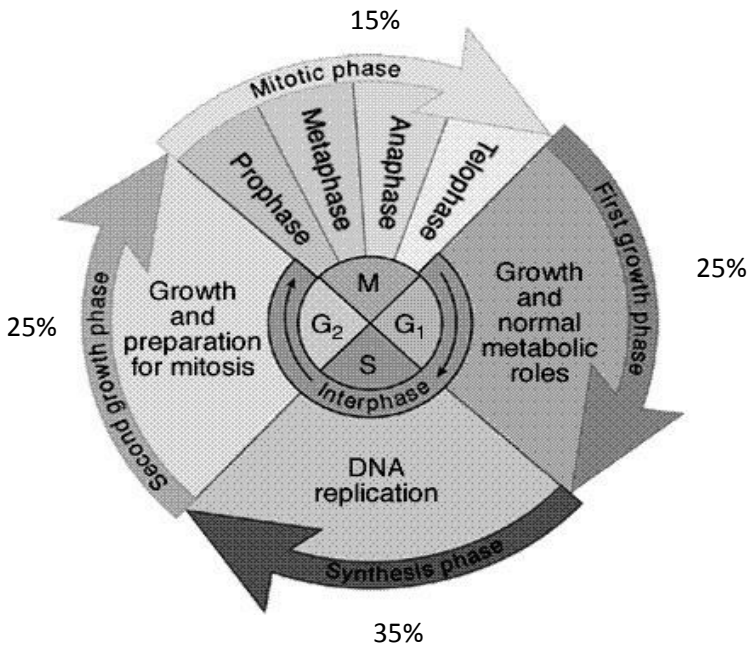
Passage VI

During human growth, cells divide in order to create new cells in the body. Cell division occurs in four stages: gap 1 (G1), synthesis (S), gap 2 (G2), and mitosis (M). *Interphase* prepares the cell for division and comprises the G1, S, and G2 phases. The physical division of two cells from one cell occurs during *mitosis*. Once the cell goes through mitosis, it *differentiates*.

Differentiation is the process by which a cell becomes a particular part of the body (i.e. a bone cell, a skin cell, etc) as opposed to any other part of the body.

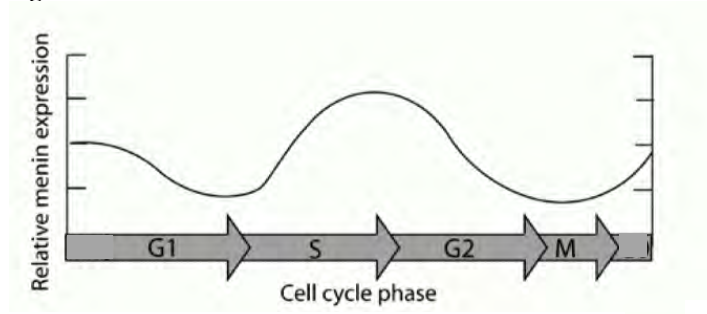
Figure 1 represents the amount of time a typical cell spends in each of the four phases of the cell cycle.

Figure 1



A particular protein, called *menin*, has been discovered within a dividing cell, but scientists are still trying to understand its role in cell division and differentiation. Figure 2 graphically represents menin levels during the cell cycle.

Figure 2



30. How much of a cell's division cycle time does the cell spend actually dividing?
 - F. 15%
 - G. 25%
 - H. 35%
 - J. 100%
31. Just before a cell begins the process of reproducing itself and actually dividing, it undergoes:
 - A. metaphase.
 - B. mitosis.
 - C. growth.
 - D. DNA replication.
32. The process of interphase ends at:
 - F. DNA replication.
 - G. metabolization.
 - H. prophase.
 - J. telophase.
33. Which of the following conclusions is supported by the data within the passage?
 - A. The expression of menin subsides when growth phases end.
 - B. DNA replication causes the expression of menin to subside.
 - C. The expression of menin peaks during mitosis.
 - D. The expression of menin is never as low as it is during mitosis.
34. Over the four stages of human growth, a developing cell spends the most time:
 - F. in DNA replication.
 - G. in mitosis.
 - H. in prophase.
 - J. in growth phases.

Passage VII

A debate has arisen during the past ten years over whether birds are modern day descendants of theropod dinosaurs, which include Tyrannosaurus Rex and the Velociraptor. The idea that birds descended from dinosaurs was introduced by Thomas Henry Huxley in the late 19th century and revived in the 1970s by scientists in the biological field of *cladistics*, a field of study that charts interrelationships between organisms. Using cladistics, biologists have plotted *junctions* (or common ancestors) of dinosaurs, which may have evolved into birds.

Still, many detractors argue that the same fossils used to support the dinosaur-to-bird theory also support their own theory of separated evolution.

Dinosaurs-to-Birds Theory

Birds are clearly descended from dinosaurs because of similarities in anatomy between the raptor family and modern birds. For example, birds share many anatomical characteristics with the mairaptor. Both have a pubis (one of the three pelvic bones) that tilts backward. Both have elongated arms and hands as well as larger than normal orbits (eye sockets in the skull). Both also have expanded sinus cavities. Velociraptor has the rudimentary beginnings of a wing-stroke in the presence of a pectoral girdle.

Also, birds have 9 air sacs that extend into the skeleton. This evolutionary leap allowed a dinosaur to become airborne by lightening its frame without sacrificing size. Some dinosaur fossils show the beginnings of this pneumatization (presence of air holes within the bone structure).

Separate-Evolution Theory

The belief that birds descended from theropods is seriously hindered by a gap in the fossil record—no common ancestor has been definitively identified. While some feathered dinosaurs have been unearthed in China, these are not evidence of the dinosaurs-to-birds theory. They prove that birds may have lost flight and evolved into dinosaurs. Three-dimensional models of a microraptor, long thought to be a junction point between theropods and birds, have determined that, though feathered, microraptors were incapable of flight. They merely glided from a high point to the ground, much like a flying squirrel. Microraptors quite probably were once birds who lost the ability to fly.

The other problem of the dinosaurs-to-birds theory is one of simple anatomy. A bird's lungs could not have evolved from a theropod's, or reptilian, lungs. Reptilian lungs have partitioning, while birds have sacs that act as bellows rather than a partitioned lung. While it is possible for lungs to evolve in order to better function, it is not anatomically possible for one type of function to switch to another.

35. Which of the following fossil discoveries would pose the most serious difficulties for the proponents of separate evolution theory?
- A. a new type of feathered, flightless dinosaur
 - B. a feathered dinosaur with a combination of partitioned and air sac lungs
 - C. a raptor with an elongated, single digit that resembles the primary wing bone
 - D. a microraptor that lived in the trees and laid eggs in nests
36. Proponents of the Dinosaurs-to-Birds theory rest much of their arguments on:
- F. anatomical similarities.
 - G. fossil discoveries.
 - H. flight models.
 - J. research into lung function.
37. A proponent of the Separate Evolution Theory, when presented with the anatomical evidence of the opposing theory, might counter that:
- A. the fossil evidence for these anatomical similarities is unlimited.
 - B. this evidence proves the two had a common ancestor.
 - C. feathered dinosaurs shared these characteristics with birds but were incapable of flight.
 - D. the difference in lung function between reptilians and birds is minimal in these animals.
38. Supporters of the Dinosaurs-to-Birds theory assume that:
- F. reptilian lungs could never have evolved from bird lungs.
 - G. anatomical similarities point to the beginning of an evolutionary branch rather than the end of one.
 - H. fossils of feathered dinosaurs do not automatically equate to an animal capable of flight.
 - J. birds and dinosaurs could not have shared a common ancestor.
39. Supporters of both theories would probably disagree about:
- A. whether at one point, birds and dinosaurs shared a common ancestor.
 - B. whether volcanoes led to the extinction of dinosaurs.
 - C. whether dinosaurs were merely flightless birds who adapted to life on the ground.
 - D. whether air sacs can evolve from partitioning within a lung structure.

40. Researchers excavating in the plains of China discovered a new species of dinosaur that was feathered and possessed a fully developed pectoral girdle. Proponents of the dinosaurs-to-birds theory hypothesized that this was the missing animal in their fossil record that would prove the junction point between dinosaurs and birds. Which of the following three-dimensional model results would these proponents expect?
- F. That the animal was capable of ground-to-air flight.
 - G. That the animal had air sacs acting as bellows.
 - H. That the animal would prove to be flightless.
 - J. That the animal would have a tilted pubis.

**END OF SECTION 4.
STOP! DO NOT RETURN TO
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Procedures and Conversation Table Used to Obtain Scale Scores from Raw Scores for JBTP Test #3

Use the JBTP table below to convert your raw score to scale scores. For each test, locate and circle your raw score in the table below. Then, read across to an outside column to find the scale score that corresponds to that raw score. Enter your scale scores in the blanks on p.49. The highest possible scale score for each test is 36.

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scores and divide by 4. If the resulting number ends in a fraction, round it off to the nearest whole number. (Round down any fraction less than one-half; round up any fraction that is one-half or more.) This is your composite score. The highest possible Composite score is 36. The national average composite score is between 20 and 21.

Scale Score	Raw Scores				Scale Score
	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science	
36	75	60	39-40	40	36
35	—	—	38	—	35
34	74	59	37	39	34
33	73	58	36	—	33
32	72	57	35	38	32
31	70-71	55-56	34	—	31
30	68-69	53-54	33	37	30
29	66-67	52	32	36	29
28	64-65	51	31	34-35	28
27	61-63	49-50	30	33	27
26	58-60	47-48	29	31-32	26
25	56-57	45-46	27-28	29-30	25
24	53-55	42-44	26	28	24
23	51-52	40-41	25	26-27	23
22	49-50	37-39	23-24	24-25	22
21	46-48	34-36	22	23	21
20	43-45	32-33	20-21	21-22	20
19	41-42	31	19	19-20	19
18	38-40	29-30	18	17-18	18
17	35-37	26-28	17	14-16	17
16	32-34	23-25	16	13	16
15	29-31	20-22	15	11-12	15
14	26-28	17-19	13-14	9-10	14
13	24-25	14-16	12	8	13
12	22-23	10-13	10-11	6-7	12
11	20-21	6-9	8-9	5	11
10	17-19	5	7	—	10
9	14-16	4	6	4	9
8	12-13	—	5	3	8
7	10-11	3	—	2	7
6	8-9	2	4	—	6
5	6-7	—	3	—	5
4	5	—	—	1	4
3	3-4	1	2	—	3
2	2	—	1	—	2
1	0-1	0	0	0	1

Test 1: English—Scoring Key

<u>Key</u>	<u>Key</u>	<u>Key</u>	<u>Key</u>
1. B	21. D	41. B	61. C
2. J	22. G	42. F	62. H
3. A	23. D	43. A	63. C
4. J	24. J	44. F	64. J
5. B	25. D	<u>45. C</u>	65. B
6. F	26. F	46. G	66. J
7. C	27. D	47. C	67. D
8. F	28. F	48. F	68. G
9. D	29. C	49. D	69. B
10. G	<u>30. H</u>	50. G	70. H
11. D	31. C	51. B	71. D
12. F	32. J	52. F	72. H
13. B	33. D	53. D	73. C
14. H	34. H	54. H	74. F
<u>15. C</u>	35. C	55. A	75. C
16. J	36. H	56. J	
17. A	37. D	57. B	
18. F	38. H	58. F	
19. B	39. A	59. C	
20. J	40. H	<u>60. G</u>	

Test 2: Mathematics—Scoring Key

<u>Key</u>	<u>Key</u>	<u>Key</u>	<u>Key</u>
1. D	16. J	31. A	46. K
2. H	17. D	32. J	47. E
3. B	18. F	33. D	48. G
4. H	19. D	34. G	49. B
5. B	20. K	35. C	50. G
6. F	21. B	36. H	51. E
7. D	22. J	37. C	52. H
8. J	23. A	38. F	53. D
9. B	24. J	39. A	54. G
10. J	25. C	40. J	55. D
11. B	26. H	41. C	56. J
12. H	27. B	42. G	57. A
13. B	28. F	43. D	58. K
14. H	29. D	44. J	59. D
15. C	30. G	45. E	60. K

Test 3: Reading—Scoring Key

<u>Key</u>	<u>Key</u>	<u>Key</u>	<u>Key</u>
1. B	11. A	21. D	31. B
2. F	12. H	22. G	32. H
3. C	13. C	23. A	33. D
4. G	14. F	24. H	34. G
5. D	15. B	25. C	35. D
6. F	16. J	26. J	36. F
7. C	17. B	27. A	37. B
8. F	18. F	28. G	38. H
9. D	19. A	29. B	39. A
10. F	20. F	30. F	40. F

Test 4: Science—Scoring Key

<u>Key</u>	<u>Key</u>	<u>Key</u>	<u>Key</u>
1. A	11. D	21. B	31. C
2. J	12. F	22. H	32. H
3. C	<u>13. C</u>	23. C	33. A
4. G	14. F	<u>24. H</u>	<u>34. J</u>
5. D	15. A	25. B	35. B
<u>6. H</u>	16. H	26. H	36. F
7. B	17. B	27. C	37. B
8. H	18. G	28. F	38. G
9. C	<u>19. C</u>	<u>29. D</u>	39. A
10. F	20. G	30. F	<u>40. F</u>

Number Correct (Raw Score) for:	
English	_____ (75)
Mathematics	_____ (60)
Reading	_____ (40)
Science	_____ (40)

Practice ACT Exam	Scale Score (see next page)
English	_____
Mathematics	_____
Reading	_____
Science	_____
Total (sum of all four)	
Composite (Total/4)	<div style="border: 1px solid black; width: 50px; height: 20px; display: inline-block;"></div>



JOHN BAYLOR

TEST • PREP



Name: _____ Date: _____

TEST 1

1 (A B C D)	14 (F G H J)	27 (A B C D)	40 (F G H J)	53 (A B C D)	66 (F G H J)
2 (F G H J)	15 (A B C D)	28 (F G H J)	41 (A B C D)	54 (F G H J)	67 (A B C D)
3 (A B C D)	16 (F G H J)	29 (A B C D)	42 (F G H J)	55 (A B C D)	68 (F G H J)
4 (F G H J)	17 (A B C D)	30 (F G H J)	43 (A B C D)	56 (F G H J)	69 (A B C D)
5 (A B C D)	18 (F G H J)	31 (A B C D)	44 (F G H J)	57 (A B C D)	70 (F G H J)
6 (F G H J)	19 (A B C D)	32 (F G H J)	45 (A B C D)	58 (F G H J)	71 (A B C D)
7 (A B C D)	20 (F G H J)	33 (A B C D)	46 (F G H J)	59 (A B C D)	72 (F G H J)
8 (F G H J)	21 (A B C D)	34 (F G H J)	47 (A B C D)	60 (F G H J)	73 (A B C D)
9 (A B C D)	22 (F G H J)	35 (A B C D)	48 (F G H J)	61 (A B C D)	74 (F G H J)
10 (F G H J)	23 (A B C D)	36 (F G H J)	49 (A B C D)	62 (F G H J)	75 (A B C D)
11 (A B C D)	24 (F G H J)	37 (A B C D)	50 (F G H J)	63 (A B C D)	
12 (F G H J)	25 (A B C D)	38 (F G H J)	51 (A B C D)	64 (F G H J)	
13 (A B C D)	26 (F G H J)	39 (A B C D)	52 (F G H J)	65 (A B C D)	

TEST 2

1 (A B C D E)	11 (A B C D E)	21 (A B C D E)	31 (A B C D E)	41 (A B C D E)	51 (A B C D E)
2 (F G H J K)	12 (F G H J K)	22 (F G H J K)	32 (F G H J K)	42 (F G H J K)	52 (F G H J K)
3 (A B C D E)	13 (A B C D E)	23 (A B C D E)	33 (A B C D E)	43 (A B C D E)	53 (A B C D E)
4 (F G H J K)	14 (F G H J K)	24 (F G H J K)	34 (F G H J K)	44 (F G H J K)	54 (F G H J K)
5 (A B C D E)	15 (A B C D E)	25 (A B C D E)	35 (A B C D E)	45 (A B C D E)	55 (A B C D E)
6 (F G H J K)	16 (F G H J K)	26 (F G H J K)	36 (F G H J K)	46 (F G H J K)	56 (F G H J K)
7 (A B C D E)	17 (A B C D E)	27 (A B C D E)	37 (A B C D E)	47 (A B C D E)	57 (A B C D E)
8 (F G H J K)	18 (F G H J K)	28 (F G H J K)	38 (F G H J K)	48 (F G H J K)	58 (F G H J K)
9 (A B C D E)	19 (A B C D E)	29 (A B C D E)	39 (A B C D E)	49 (A B C D E)	59 (A B C D E)
10 (F G H J K)	20 (F G H J K)	30 (F G H J K)	40 (F G H J K)	50 (F G H J K)	60 (F G H J K)

TEST 3

1 (A B C D)	8 (F G H J)	15 (A B C D)	22 (F G H J)	29 (A B C D)	36 (F G H J)
2 (F G H J)	9 (A B C D)	16 (F G H J)	23 (A B C D)	30 (F G H J)	37 (A B C D)
3 (A B C D)	10 (F G H J)	17 (A B C D)	24 (F G H J)	31 (A B C D)	38 (F G H J)
4 (F G H J)	11 (A B C D)	18 (F G H J)	25 (A B C D)	32 (F G H J)	39 (A B C D)
5 (A B C D)	12 (F G H J)	19 (A B C D)	26 (F G H J)	33 (A B C D)	40 (F G H J)
6 (F G H J)	13 (A B C D)	20 (F G H J)	27 (A B C D)	34 (F G H J)	
7 (A B C D)	14 (F G H J)	21 (A B C D)	28 (F G H J)	35 (A B C D)	

TEST 4

1 (A B C D)	8 (F G H J)	15 (A B C D)	22 (F G H J)	29 (A B C D)	36 (F G H J)
2 (F G H J)	9 (A B C D)	16 (F G H J)	23 (A B C D)	30 (F G H J)	37 (A B C D)
3 (A B C D)	10 (F G H J)	17 (A B C D)	24 (F G H J)	31 (A B C D)	38 (F G H J)
4 (F G H J)	11 (A B C D)	18 (F G H J)	25 (A B C D)	32 (F G H J)	39 (A B C D)
5 (A B C D)	12 (F G H J)	19 (A B C D)	26 (F G H J)	33 (A B C D)	40 (F G H J)
6 (F G H J)	13 (A B C D)	20 (F G H J)	27 (A B C D)	34 (F G H J)	
7 (A B C D)	14 (F G H J)	21 (A B C D)	28 (F G H J)	35 (A B C D)	

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