READING

QUESTIONS 21-50

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

One hundred and fifty million years ago, flowers were not as colorful as they are today. Blossoms that contained the pigment chlorophyll, such as oak blossoms, were green; otherwise, flowers lacking chlorophyll were white, like dogwood blossoms. Over millions of years, according to current theory, the coloration of individual blossoms was occasionally altered by genetic mutations. Mutations are, in effect, errors in the genetic codes inherited from parent plants. For example, the yellow in daffodils began with a mutation of the gene that carries instructions for the use of carotene, a yellow pigment that the plant uses to make food.

Although the blossoms of most wild plants are still green or white, there are more colors now than there were 150 million years ago. Of these newer colors, yellow shades are the most common, followed by orange and red, including shades of pink. Blue flowers are the rarest, because relatively few mutations resulted in that color.

If a color-related genetic mutation helps a plant to survive, that gene may be passed from the parent to its offspring. Many flowering plants reproduce by means of pollination, a process that requires outside assistance. Some plants are pollinated by the wind, a few by water. Others are pollinated by flying creatures such as insects, bats, and hummingbirds. Moreover, plant breeders deliberately cross-pollinate certain flowers to cultivate desirable traits, such as the unusual colors of some "designer" rose varieties.

Bird and insect pollinators seek out blossoms because they are looking for nectar, the sugary liquid in the heart of a flower. When the first color mutations appeared millions of years ago, the colorful blossoms became more noticeable and were visited more frequently. When the flying creatures drank the nectar from a flower, their bodies brushed against the pollen and carried it to the next plant, unintentionally fertilizing the plants as they went along. As a result, the more colorful plants were more likely to reproduce.

Many plants are pollinated only by day or only by night. Insects that are active during the day notice certain bright colors. Bees, for example, can distinguish hues of yellow and blue, but they cannot see red. Hummingbirds are strongly attracted to red blossoms, and some red flowers, such as the cardinal flower, are pollinated only by hummingbirds. Night-flying moths are attracted by white flowers, whose paleness is visible by moonlight. Many night-pollinated flowers also have fragrances that are attractive to moths.

Over millions of years, the combination of color mutations and pollination by flying creatures has led to an abundance of colorful blossoms across the earth.

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

A. how genetic changes affect birds and insects
B. how bees fertilize flowers
C. how insects see colors
D. how flowering plants reproduce
E. how colorful blossoms developed

22. Which of the following blossoms would most likely be pollinated by night-flying moths rather than bees?

F. red, lightly scented blossoms
G. yellow blossoms with blue centers
H. dark blue, heavily perfumed blossoms
J. bright green blossoms that sway in the wind
K. pale white blossoms with a strong scent

23. Why are blue flowers so rare?

A. There were fewer mutations resulting in blue flowers.
B. Bees and other insects avoid blue flowers.
C. Blue flowers have insufficient pollen.
D. Bees cannot perceive the color blue.
E. Blue flowers do not contain carotene.

24. Why were flowers of 150 million years ago always green or white?

F. Yellow and red flowers were not hardy enough to survive.
G. At that time, the only pigment in flowers was chlorophyll.
H. Yellow and red flowers did not contain nectar.
J. Oak blossoms and dogwood blossoms were the only flowers.
K. Insects were not attracted to colorful flowers.

25. Why do birds and insects fly from one plant to another?

A. to fertilize the plants
B. to help plants with mutations to reproduce
C. to produce more color mutations
D. to create desirable traits in the plants
E. to search for nectar to drink

26. In lines 28-29, what does the author mean by the statement that pollination "requires outside assistance"?

F. Color-related mutations are passed from parent to offspring.
G. Only flowering plants reproduce by pollination.
H. The plants rely on wind, water, or flying creatures for pollination.
J. Some methods of pollination are intentional, while others are not.
K. Blossom colors other than green and white were produced by genetic mutations.

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Most movies about spies and undercover agents feature fascinating special equipment. Many of these gadgets exist only in the imaginations of script writers, but others are actually used in espionage activities. One device with a surprisingly long and colorful history, both in and out of the cloak-and-dagger world, is the concealed camera.

In the late nineteenth century, "detective cameras" were popular with amateur photographers who wanted to take snapshots of unsuspecting people on the street. The camera was usually carried in plain view. Its disguise was simple: it was a plain box resembling a large and rather heavy parcel or a piece of luggage, with no external lens or controls. When people caught on to the deception, though, designers began hiding cameras in other objects, ranging from hats and books to purses and pocket watches. One concealed camera even looked like an ordinary camera, but had mirrors that allowed users to take photographs at a right angle to the direction of whatever the photographer seemed to be viewing.

Although most early spy cameras were meant to be used on the ground, cameras have been hidden in the sky almost from the beginning of photography. In World War I, both sides realized the strategic value of taking aerial photographs of enemy territory from the newly invented airplane. To spy more discreetly, without the use of airplanes, the Germans attached cameras to homing pigeons and sent them over French army positions. Timers were set to trigger the cameras when the pigeons were expected to be flying over their targets. That particular attempt proved impractical, but the idea behind it did not: aerial photography became a staple of World War II.

In the mid-twentieth century, a new era of spying with cameras began under the Cold War. This was a period of worldwide tension and competition between the Communist world, led by the Soviet Union, and the Western world, represented by the United States and its allies. The conflict was expressed through propaganda, arms races, and especially espionage. During the Cold War, both sides competed to develop new technologies to use photography in spying. Sophisticated concealed cameras were put in matchboxes, pens, rings, cigarette lighters, makeup cases, guns, and even hidden in clothing, with the lens concealed in a button. Almost any object that could be carried without attracting attention was probably made into a camera and carried by an undercover agent. Cameras were also hidden in furniture and office machines such as copiers, which took photos of every document that was copied. The development of the long-range telephoto lens even allowed spies to take clear photos from a distance, such as across the street from an embassy.

Today, space has proven to be the ultimate location for hidden cameras, as satellite-mounted cameras can produce highly detailed photographs of objects anywhere on earth.

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

- **A.** the role of hidden cameras in national security
- **B.** the problems associated with hidden cameras
- **C.** the mechanics of the "detective camera"
- **D.** historical information about the concealed camera
- **E.** how cameras are mounted in satellites

28. According to the passage, "detective cameras" were popular with

- **F.** spies.
- **G.** airplane pilots.
- **H.** the German army.
- **J.** professional photographers.
- **K.** amateur photographers.

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29. What was the original purpose of the early detective cameras?

- **A.** to resemble an ordinary object such as a box
- **B.** to take pictures at a right angle
- **C.** to use in espionage activites by secret agents
- **D.** to take pictures without the subjects' knowledge
- **E.** to be carried by homing pigeons for surveillance

30. The camera with mirrors (lines 21-25) allowed the photographer to

- **F.** conceal the camera in a hat or pocket watch.
- **G.** take a picture with no external lens or controls.
- **H.** take aerial photographs.
- **J.** take a picture of one scene while appearing to take a picture of another.
- **K.** determine whether other photographers were using detective cameras.

31. Photographers stopped using the box-type "detective camera" because

- **A.** people were no longer deceived by them.
- **B.** the cameras could not be used with external lenses.
- **C.** they wanted to avoid being mistaken for secret agents.
- **D.** professional photographers refused to use them.
- **E.** espionage was conducted during the war.

32. What was the "idea" referred to in line 40?

- **F.** taking photographs without permission
- **G.** taking photographs from above
- **H.** locating military targets
- **J.** using cameras in wartime
- **K.** attaching cameras to homing pigeons

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The eruption of the Philippine volcano Mount Pinatubo in June 1991 sent a huge cloud of gas and dust encircling the globe. The dust and ash from Mount Pinatubo was blamed for a two-year decrease in global temperature, changes in weather patterns, and damage to the ozone layer. The situation brings to mind a meteorological event that occurred 175 years earlier. At that time, harsh weather conditions plagued much of eastern North America, and, to a lesser extent, northern Europe.

April 1816 brought typical spring weather to upstate New York and New England; trees budded and farmers prepared to plow and plant. In May, however, the expected warm temperatures failed to arrive. Most people remained optimistic, waiting for the summer that was "just around the corner." They waited in vain. June ushered in what modern meteorologists call "The Year Without a Summer." During the first week of June, ten inches of snow fell on New England. Throughout the month, temperatures rarely rose above the 30s. Many farmers replanted crops several times, only to see them stunted or destroyed by sleet, hail, and icy winds. July and August brought little improvement. During most days the temperature stayed in the 40s. Farmers' diaries document their daily struggles with near-freezing temperatures, failing crops, and dying farm animals. The few crops that managed to survive were killed by frost in mid-September. Winter came early in New England and was unusually severe. Even the South was affected; on July 4, the high temperature for Savannah, Georgia, was only 46 degrees!

Some religious leaders warned their congregations that the unusual weather meant that the end of the world was drawing near. Other leaders attributed the cool weather to unusual sunspot activity. The proliferation of the newly invented lightning rod was also blamed. Some people believed that lightning rods had interrupted the natural temperature balance of the earth, causing the cooler temperatures.

It was not until October that the first plausible explanation for "The Year Without a Summer" was suggested. A German astronomer, Friedrich Bessel, reported seeing thick clouds of dust in the upper atmosphere. He theorized that these dust particles screened portions of the earth from the warming rays of the sun. It was discovered that, in April 1815, Mount Tambora, an Indonesian volcano, had erupted with such force that it had sent an estimated 100 cubic miles of fine dust into the atmosphere. Witnesses to the eruption reported that the sky remained dark for two days. The dust then rose high into the stratosphere, where it encircled the world for several years to come.

Skeptics in 1816 doubted that a far-away volcano could steal their summer. However, most present-day researchers believe Bessel's explanation to be generally correct, demonstrating the global nature of weather. The dust in the atmosphere eventually settled, and the spring of 1817 was back to normal.

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

- **A.** why some religious leaders believed the end of the world was coming in 1816
- **B.** a summer of strange weather and its probable cause
- **C.** the importance of summer weather to agriculture in New England
- **D.** two volcanic eruptions
- **E.** a comparison of the weather of 1816 and 1991

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34. What is the most likely reason farmers persisted in replanting their crops?

F. They believed that the cold weather could not continue all summer long.
G. They were attempting to increase crop yields to higher levels than they had ever before achieved.
H. They thought that crops would be able to survive even though the weather remained cold.
J. The weather had warmed up by July.
K. They thought the June snowfalls would provide needed moisture.

35. Which of the following was probably true about the winter of 1816-1817?

A. The government decided to establish a weather forecasting service.
B. Temperatures were warmer than usual for that time of year.
C. New Englanders faced shortages of fruits and vegetables.
D. Bessel's theory was completely discredited.
E. People quickly forgot about "The Year Without a Summer."

36. Which of the following is implied by the phrase "the global nature of weather" (line 70)?

F. Meteorologists around the world need to stay in close contact.
G. Extreme weather conditions may stimulate volcanic eruptions in other parts of the world.
H. Natural disasters tend to occur in the same part of the world at the same time.
J. Conditions in one part of the world can affect weather in another part.
K. A single storm may cover the entire world.

37. Which of the following situations, if it had occurred, would lend further support to the conclusion that "The Year Without a Summer" was caused by the eruption of Mount Tambora?

A. Volcanoes all over the world erupted at the same time as Mount Tambora.
B. Other parts of the world also experienced unusually cold weather in 1816.
C. Temperatures in Indonesia in 1816 were higher than average.
D. Subsequent summers in New England were warmer than average.
E. The eruption of Mount Pinatubo was larger than the eruption of Mount Tambora.

38. Which of the following best summarizes Bessel's theory?

F. The cold weather would end when the winter of 1816-1817 began.
G. The cold summer of 1816 indicated that the world was about to end.
H. The eruptions of Mount Tambora and Mount Pinatubo affected global weather in the same way.
J. The eruption of Mount Pinatubo is responsible for numerous weather changes.
K. Dust particles in the air blocked the warmth of the sun.

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As France moved toward revolution at the end of the eighteenth century, a new artistic style, Neoclassicism, gave expression to the changed attitudes that contributed to the fall of the French monarchy. Most art from the first half of the eighteenth century had been decorative and sentimental. Subjects of paintings were typically domestic scenes or stories from mythology containing simple moral lessons. With the advent of the Neoclassical movement, however, art began to return to the classical style and heroic themes of the ancient Greeks and Romans.

The new movement was largely defined by the work of Jacques-Louis David, although he was not its founder. His 1785 painting *The Oath of the Horatii* is considered to be the finest example of Neoclassicism. It is also one of the finest examples of French Revolutionary art. David admired the ancient Roman republic, governed by its elected consuls and senate rather than by a king (the way that France was governed). He chose as his subject a famous story from Roman history in which the Horatius brothers swear an oath of loyalty to the republic. The setting of the painting resembles a bare stage, with only three shadowy stone arches to provide a backdrop for the figures. Three brothers stand together, their hands raised dramatically toward the swords held by their father. Behind the father's back, the mother and sisters are slumped in grief. All of the figures are positioned so closely to the foreground that it is difficult for viewers to distance themselves from the scene. Light falls from an unseen window, illuminating the family against the dark background.

At first, some critics condemned David's composition as too stark and severe. However, the French middle class, for whom the work was intended, had no trouble interpreting it in terms of their own times. To them, *The Oath of the Horatii* represented a call to civic devotion and the promise of a future in which the wasteful, self-indulgent excesses of the French royal family and aristocracy would be replaced by honor, self-sacrifice, and patriotism. Four years after the painting was first shown in 1785, the social trends reflected in the work of David and other Neoclassicists exploded into revolution against King Louis XVI.

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

- **A.** The French aristocracy were among the first supporters of Neoclassicism.
- **B.** Jacques-Louis David was a great French artist and patriot.
- **C.** Neoclassicism began with *The Oath of the Horatii*.
- **D.** The French Revolution was the result of the extravagance and wastefulness of the French monarchy.
- **E.** David's painting in the Neoclassic style expressed the political mood of late-eighteenth-century France.

40. Why did late-eighteenth-century art critics give *The Oath of the Horatii* negative reviews?

- **F.** They did not understand the story of the Horatius brothers.
- **G.** They thought the style of the painting was too harsh.
- **H.** They feared that David would become the leader of a new art movement.
- **J.** They objected to a French painter's using a Roman setting for the painting.
- **K.** They knew that King Louis XVI would not like the painting.

41. Which of the following was most likely to have been the subject of a Neoclassical painting?

- **A.** a simple story from mythology
- **B.** a portrait of King Louis XVI
- **C.** a soldier defending the city gates
- **D.** a mother and her three small children sitting at the dinner table
- **E.** a vase of flowers, a basket, and spilled fruit lying on a plush drapery

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42. David's painting *The Oath of the Horatii* depicts three brothers

F. pledging their allegiance to Rome.
G. acting on the set of a stage play.
H. handing their swords to their father.
J. slumped in grief.
K. fighting in the French Revolution.

43. The Neoclassicism movement was an advance indication of

A. the decorative art of the eighteenth century.
B. the French Revolution.
C. the Roman Republic.
D. the self-indulgence of the French monarchy.
E. the popularity of stories from mythology.

44. How did the French middle class interpret *The Oath of the Horatii*?

F. The father represented King Louis XVI.
G. The light from an unseen window symbolized the call to arms.
H. The story of the Horatius brothers was an appeal to French patriotism.
J. The three brothers represented the new Neoclassical painters.
K. The three stone arches suggested honor, self-sacrifice, and patriotism.

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On Monday evening, September 26, 1960, sixty million Americans turned on their TV sets to view the first televised political debate in a campaign for the presidency of the United States. As of that date, it was by far the largest number ever to witness a political discussion. The novelty of the event drew even those with little or no interest in politics.

The candidates, Republican Vice President Richard M. Nixon and Democratic Senator John F. Kennedy, had agreed to face each other and the nation in four one-hour sessions that the press dubbed the "Great Debates." Many expected Vice President Nixon to win the debates easily. He was ahead in the newspaper polls, he was an experienced public speaker, and he had served as vice president for nearly eight years. Senator Kennedy was less well-known and, at forty-three, was the youngest man ever to run for president. Throughout the presidential race, his opponents criticized him for his relative youth and inexperience.

By mutual agreement, the first session was limited to domestic issues. Each candidate was given eight minutes to make his opening remarks. During the remainder of the hour, the candidates took turns responding to questions posed by selected reporters. Both Kennedy and Nixon dealt with the issues calmly and carefully. Viewers who expected to see a free-for-all were disappointed. The way the two men appeared on the television screen, however, may have been as important as what they said. Kennedy looked at the camera while answering questions, appearing to speak directly to his viewers and give them straight answers. Nixon was recovering from a severe bout of influenza, and he appeared tense and tired. He looked at the reporters who asked the questions instead of at the camera, giving some viewers the impression that he avoided eye contact with his audience, and thus suggesting that he was not trustworthy. Most commentators agreed that Kennedy gained from the encounter: many viewers who had previously felt he lacked the maturity necessary to be president were won over by his charm, poise, and confident manner.

While far fewer people watched the three later sessions, much discussion ensued regarding the influence of the Great Debates on the outcome of the 1960 presidential election. Some feared that the better TV performer was bound to come across as being the better candidate. "Is this a good way to judge a person's ability to serve as president of the United States?" they asked.

Kennedy ultimately won the election, but it was by the narrowest popular vote margin in more than eighty years. Some observers concluded that, had the Great Debates been broadcast on radio and not on television, Nixon would have won.

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

- **A.** the careers of Nixon and Kennedy
- **B.** how elections have changed since 1960
- **C.** domestic issues in the Kennedy-Nixon debates
- **D.** the presidential debates of 1960
- **E.** the qualifications of Nixon and Kennedy

46. According to the passage, why did people who were not normally interested in politics tune in to the first of the Great Debates?

- **F.** Vice President Nixon was a popular politician.
- **G.** Television had never before been used in this way.
- **H.** They had heard that Kennedy was young and attractive.
- **J.** They wanted to see if the newspaper polls were correct.
- **K.** The election was expected to be very close.

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47. Which of the following issues was most likely to be discussed during the first debate?

A. problems of American industry
B. politics of the Middle East
C. world nuclear disarmament
D. trade with Europe
E. the status of Cuba

48. What evidence does the author provide to support the last sentence of the passage?

F. Far fewer people watched the three later debates.
G. Both candidates dealt with the issues calmly and carefully.
H. The candidates did not cause a free-for-all.
J. The debate sessions were each limited to specific issues.
K. Nixon was more experienced and well-known than Kennedy.

49. According to the passage, how did Kennedy benefit from the debates?

A. His grasp of domestic issues was shown to be superior to Nixon's.
B. The debates focused on his years of experience in the Senate.
C. He appeared to have attractive personal characteristics.
D. He maintained eye contact with the reporters asking the questions.
E. He spoke well despite his recent illness.

50. According to the passage, which of the following would have been the most likely result if the candidates had **not** debated on television in 1960?

F. Kennedy would have won the election anyway.
G. The election results would have been much closer.
H. Nixon would have had a better chance of winning the election.
J. The candidates would not have debated at all.
K. Nixon would not have improved his on-screen performance.

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Part 2 — Mathematics

Suggested Time — 75 Minutes

50 QUESTIONS

General Instructions

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

IMPORTANT NOTES:

(1) Formulas and definitions of mathematical terms and symbols are **not** provided.

(2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be figured out from the information given.

(3) Assume that a diagram is in one plane unless the problem specifically states that it is not.

(4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, (on a graph) lines that appear to be parallel can be assumed to be parallel; likewise for concurrent lines, straight lines, collinear points, right angles, etc.

(5) Reduce all fractions to lowest terms.

51. If $\frac{4}{5}$ of P is 48, what is $\frac{3}{5}$ of P?

A. 12
B. 15
C. 20
D. 36
E. 60

52. 1 sind = 5.6 ricks
1 sind = 12.88 dalts

Using the conversions above, how many dalts are equivalent to 1 rick?

F. 0.43 dalts
G. 2.3 dalts
H. 7.28 dalts
J. 18.48 dalts
K. 72.128 dalts

53. Jack scored a mean of 15 points per game in his first 3 basketball games. In his 4th game, he scored 27 points. What was Jack's mean score for the 4 games?

A. 15
B. 16
C. 17
D. 18
E. 21

54. If $0.00102 = \frac{102}{N}$, what is the value of N?

F. 10,000
G. 100,000
H. 1,000,000
J. 100,000,000
K. 1,000,000,000

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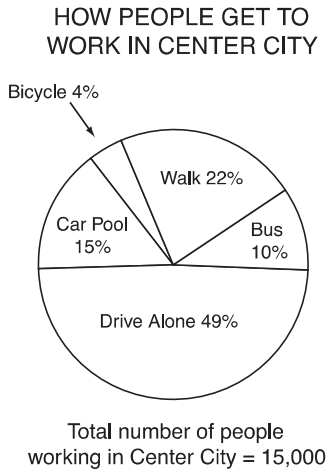
55.



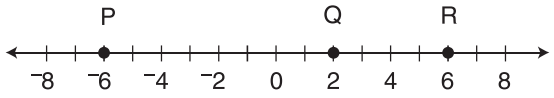
How many more people walk to work than ride their bicycles to work in Center City?

A. 18
B. 22
C. 2,700
D. 2,800
E. 3,000

56. Judy is n years older than Carmen and twice as old as Frances. If Frances is 15, how old is Carmen in terms of n?

F. $30 + n$
G. $15 + n$
H. $15 + 2n$
J. $15 - n$
K. $30 - n$

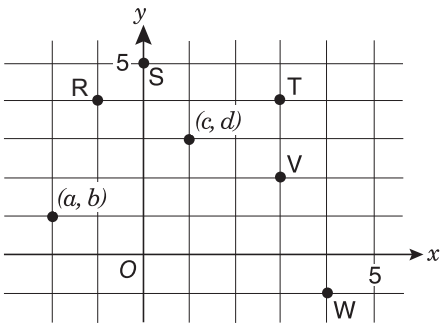
57.



How many units is it from the midpoint of $\overline{PQ}$ to the midpoint of $\overline{QR}$?

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

58.



The figure above is drawn to scale. Which point best shows the location of $(c + a, d + b)$?

F. R
G. S
H. T
J. V
K. W

59. $\dfrac{(-51)^2}{17^3} =$

A. -2

B. $-\frac{1}{17}$

C. $\frac{9}{17}$

D. $\frac{16}{17}$

E. 2

60. What is the greatest common factor of 2,205 and 3,675?

F. 147
G. 245
H. 441
J. 735
K. 1,225

61. $|190 - 210| + |19 - 21| + x = 100$

In the equation above, what is the value of x?

A. 78
B. 88
C. 100
D. 122
E. 123

62. The set P consists of all prime numbers greater than 6 and less than 36. What is the median of the numbers in P?

F. 17
G. 17.75
H. 18
J. 18.75
K. 19

63. A pitcher contained 32 ounces of orange juice and 12 ounces of grapefruit juice. More grapefruit juice was added to the pitcher until grapefruit juice represented $\frac{1}{3}$ of the pitcher's contents. How many ounces of grapefruit juice were added?

A. 2 oz
B. 4 oz
C. 8 oz
D. 16 oz
E. 44 oz

64. DISTRIBUTION OF EYE AND HAIR COLOR FOR 64 CHILDREN

		Eye Color		
		Brown	Blue	Total
Hair Color	Blond	11	18	29
	Black	15	20	35

The table above shows the distribution of eye color and hair color for 64 children. How many of these children have blond hair or brown eyes, but **not both**?

F. 22
G. 33
H. 44
J. 53
K. 55

65. On a scale drawing, a distance of 1 foot is represented by a segment 0.25 inch in length. How long must a segment on the scale drawing be to represent a 36-inch distance?

A. 0.25 in.
B. 0.75 in.
C. 3 in.
D. 9 in.
E. 144 in.

66. There are 45 eighth graders and 20 seventh graders in a school club. The president of this club wants 40% of the club's members to be seventh graders. How many **more** seventh graders must join the club in order to meet the president's wishes? (Assume that the number of eighth graders remains the same.)

F. 6
G. 7
H. 8
J. 10
K. 27

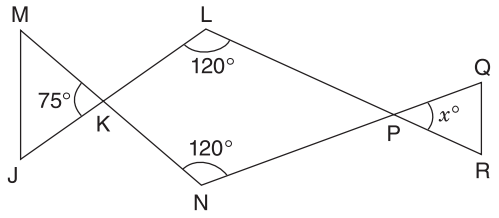
67. How many different two-digit numbers can be formed from the digits 7, 8, 9 if the numbers must be even and no digit can be repeated?

A. 0
B. 1
C. 2
D. 3
E. 6

68. The fuel mix for a small engine contains only 2 ingredients: gasoline and oil. If the mix requires 5 ounces of gasoline for every 6 ounces of oil, how many ounces of gasoline are needed to make 33 ounces of fuel mix?

F. 3
G. 6
H. 15
J. $27\frac{1}{2}$
K. 165

69.



In the figure above, $\overline{JKL}$, $\overline{MKN}$, $\overline{NPQ}$, and $\overline{LPR}$ are straight line segments. What is the value of x?

A. 25
B. 45
C. 50
D. 60
E. 75

70. A roofing contractor uses shingles at a rate of 3 bundles for each 96 square feet of roof covered. At this rate, how many bundles will he need to cover a roof that is 416 square feet?

F. 5
G. 12
H. 13
J. 14
K. 15

71. How many integers are between $\frac{5}{2}$ and $\frac{20}{3}$?

A. 3
B. 4
C. 5
D. 10
E. 15

72. What is the prime factorization of 714?

F. $2 \cdot 357$
G. $2 \cdot 3 \cdot 119$
H. $2 \cdot 7 \cdot 51$
J. $6 \cdot 7 \cdot 17$
K. $2 \cdot 3 \cdot 7 \cdot 17$

73. If R, S, and T are integers and R + S and T − S are both odd numbers, which of the following must be an **even** number?

A. R + T
B. S + T
C. R
D. S
E. T

74.

On the number line above, point E (not shown) is the midpoint of $\overline{AC}$ and point F (not shown) is the midpoint of $\overline{BD}$. What is the length of $\overline{EF}$?

F. 1 unit
G. 2 units
H. 2.5 units
J. 3 units
K. 11 units

75.

Regular Price	$2.49
Discount	– $0.60
Sale Price	$1.89
6% Tax	$0.15
Total	$2.04

Nikolai bought a packet of pens. His receipt is shown above. Assume that sales tax is rounded to the nearest cent. If the 6% sales tax had been computed on the sale price instead of on the regular price, how much lower would the tax have been?

A. $0.01
B. $0.02
C. $0.03
D. $0.04
E. $0.36

76. Jack and Roberto were assigned to guard a tower. Each was to watch for 5 hours, then rest 5 hours while the other watched. If Roberto began his first watch at 6:00 p.m., at what time will he begin his third watch?

F. 11:00 p.m.
G. 4:00 a.m.
H. 9:00 a.m.
J. 7:00 p.m.
K. 2:00 p.m.

77. On a particular vehicle, the front tire makes three revolutions for every one revolution the back tire makes. How many times larger is the radius of the back tire than the radius of the front tire?

A. $\frac{1}{3}$
B. 3
C. $\frac{3}{2}\pi$
D. 3π
E. 9

CONTINUE ON TO THE NEXT PAGE ▶

78. The regular price of a 12-ounce bag of candy is \$2.90. Lily has a coupon for 30% off one of these bags. What is the price per ounce (to the nearest cent) that Lily will pay if she uses the coupon?

F. \$0.07
G. \$0.15
H. \$0.17
J. \$0.22
K. \$0.24

79. $|(^-6) - (^-5) + 4| - |3 - 11| =$

A. $^-7$
B. $^-5$
C. $^-1$
D. 1
E. 11

80. To paint a room, Suzanne uses blue and white paint in the ratio of blue:white = 8:3. What was the **total** number of gallons of paint used if she used 6 gallons of blue paint?

F. $2\frac{1}{4}$ gal.

G. $8\frac{1}{4}$ gal.

H. 9 gal.

J. 16 gal.

K. 22 gal.

81. Which sum below can be expressed as a non-repeating decimal?

A. $\frac{1}{2} + \frac{1}{6}$

B. $\frac{1}{3} + \frac{1}{4}$

C. $\frac{1}{3} + \frac{1}{5}$

D. $\frac{1}{4} + \frac{1}{5}$

E. $\frac{1}{4} + \frac{1}{6}$

82. There are 1,000 cubic centimeters in 1 liter and 1,000 cubic millimeters in 1 milliliter. How many cubic millimeters are there in 1,000 cubic centimeters?

F. 1,000
G. 10,000
H. 100,000
J. 1,000,000
K. 1,000,000,000

83. A box contains 11 marbles—7 red and 4 green. Five of these marbles are removed at random. If the probability of drawing a green marble is now 0.5, how many red marbles were removed from the box?

A. 1
B. 2
C. 3
D. 4
E. 5

84. On the first leg of its trip, a plane flew the 900 miles from New York City to Atlanta in 2 hours. On the second leg, it flew the 1,400 miles from Atlanta to Albuquerque in $2\frac{1}{2}$ hours. How much greater was the plane's mean speed, in miles per hour, on the second leg than on the first?

F. 110 mph
G. 150 mph
H. 200 mph
J. 250 mph
K. 500 mph

85. A water tank is $\frac{1}{3}$ full; then, 21 gallons of water are added to the tank, making it $\frac{4}{5}$ full. How many gallons of water could the tank hold if it were completely full?

A. 35 gal.
B. 45 gal.
C. 56 gal.
D. 84 gal.
E. 105 gal.

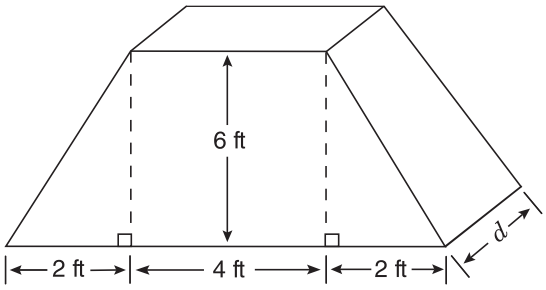
86. Today, Tom is $\frac{1}{4}$ of Jordan's age. In 2 years, Tom will be $\frac{1}{3}$ of Jordan's age. How old is Jordan today?

F. 4 yr
G. 6 yr
H. 12 yr
J. 16 yr
K. 22 yr

87. In how many different ways can you make exactly \$0.75 using only nickels, dimes, and quarters, if you must have at least one of each coin?

A. 2
B. 4
C. 6
D. 7
E. 12

88.



The end of a tent has a cross-section as shown above. What is the depth (d) of the tent if its volume is 216 cubic feet?

F. $4\frac{1}{2}$ ft
G. 6 ft
H. $6\frac{1}{2}$ ft
J. 7 ft
K. 8 ft

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

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

90. Set R contains all integers from 10 to 125, inclusive, and Set T contains all integers from 82 to 174, inclusive. How many integers are included in R, but **not** in T?

F. 23
G. 48
H. 49
J. 71
K. 72

91. Joe began to increase the speed of his car at 2:00 p.m. Since that time, the speed of Joe's car has been steadily increasing by $1\frac{1}{2}$ miles per hour for each half minute that has passed. If the car is now traveling $65\frac{1}{2}$ miles per hour, for how many minutes has the car been exceeding the speed limit of 55 miles per hour?

A. $3\frac{1}{3}$ min
B. $3\frac{1}{2}$ min
C. $4\frac{1}{2}$ min
D. 5 min
E. 7 min

92. How many positive two-digit numbers are evenly divisible by 4?

F. 22
G. 23
H. 24
J. 25
K. 26

93. Ang has x dollars in his savings account, and Julia has y dollars in her savings account. Ang gives Julia $\frac{1}{3}$ of the money in his savings account, which Julia deposits into her savings account. Julia then spends $\frac{1}{4}$ of the total in her savings account. Express the amount of money Julia spent in terms of x and y.

A. $\frac{y}{4}+\frac{x}{12}$

B. $\frac{y}{4}+\frac{x}{3}$

C. $\frac{y}{4}+\frac{x}{7}$

D. $\frac{3y}{4}+\frac{x}{4}$

E. $\frac{3y}{4}+\frac{x}{3}$

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

F. \$1,875
G. \$2,500
H. \$3,125
J. \$3,750
K. \$4,375

95. In a restaurant, the mean annual salary of the 4 chefs is \$68,000, and the mean annual salary of the 8 waiters is \$47,000. What is the mean annual salary of all 12 employees?

A. \$47,000
B. \$54,000
C. \$55,500
D. \$57,500
E. \$61,000

96. If x can be any integer, what is the greatest possible value of the expression $1 - x^2$?

F. $^{-}1$
G. 0
H. 1
J. 2
K. Infinity

97. A steel container is shaped like a cube 10 feet on each side. This container is being filled with water at a rate of 7 cubic feet per minute. At the same time, water is leaking from the bottom of the container at a rate of 2 cubic feet per minute. If the container is exactly half-filled at 9:00 a.m., at what time will the container begin to overflow?

A. 9:55 a.m.
B. 10:00 a.m.
C. 10:11 a.m.
D. 10:40 a.m.
E. 12:20 p.m.

CONTINUE ON TO THE NEXT PAGE ▶

98.

PRICES FOR AD SPACE

Space	Price
$\frac{1}{4}$ page	\$200
$\frac{1}{2}$ page	\$350
full page	\$600

The table above shows prices for newspaper advertising. A store purchased quarter pages, half pages, and full pages of space in equal numbers for a total of \$11,500. What is the total amount of page space the store purchased?

F. $1\frac{3}{4}$ pages

G. 10 pages

H. $16\frac{1}{2}$ pages

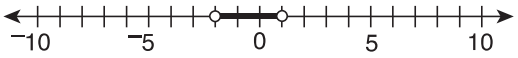
J. $17\frac{1}{4}$ pages

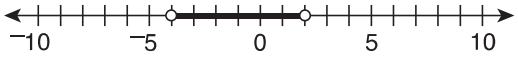
K. $17\frac{1}{2}$ pages

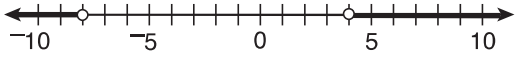
99. A rectangular floor is 12 feet wide and 16 feet long. It must be covered with square tiles that are 8 inches on each side. Assume there is no space between adjacent tiles. If the tiles cost \$8 each, how much will it cost to buy the tiles needed to cover the floor?

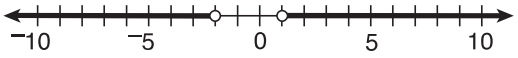
A. \$24
B. \$64
C. \$192
D. \$2,304
E. \$3,456

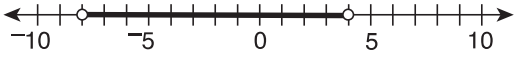
100. Which number line below shows the solution to the inequality $-4 < \frac{x}{2} < 2$?

F.


G.


H.


J.


K.


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

99. (**E**) Since the floor measurement is in feet and the tile measurement is in inches, change inches into feet:

$8 \text{ in.} = \frac{8}{12} = \frac{2}{3} \text{ ft}$

The floor is 12 ft wide. To find the number of tiles needed along the width of the floor, divide the width by the size of a tile:

$12 \text{ ft} \div \frac{2}{3} = 12 \cdot \frac{3}{2} = 18 \text{ tiles}$

The floor is 16 ft long. Find the number of tiles needed along the length of the floor:

$16 \text{ ft} \div \frac{2}{3} = 24 \text{ tiles}$

To find the total number of tiles needed, multiply the number needed along the width by the number needed along the length:

$18 \cdot 24 = 432 \text{ tiles}$

To find the total cost, multiply the total tiles by the cost per tile:

$432 \text{ tiles} \cdot \$8 = \$3{,}456$

100. (**K**) First, multiply each term by 2 to eliminate the fraction:

$-4(2) < x < 2(2)$
$-8 < x < 4$

Therefore, x must be between -8 and 4, which is Option K.

Answer Key for Sample Form A

Paragraph 1
T U S R Q

Paragraph 2
S R U Q T

Paragraph 3
U T R S Q

Paragraph 4
U S T R Q

Paragraph 5
Q S R U T

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