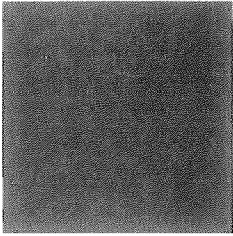# Form 72F

(June 2016)

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2015 | 2016

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ENGLISH TEST
45 Minutes — 75 Questions

DIRECTIONS: In the five passages that follow, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the underlined part. In most cases, you are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose "NO CHANGE." In some cases, you will find in the right-hand column a question about the underlined part. You are to choose the best answer to the question.

You will also find questions about a section of the passage, or about the passage as a whole. These questions do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, choose the alternative you consider best and fill in the corresponding oval on your answer document. Read each passage through once before you begin to answer the questions that accompany it. For many of the questions, you must read several sentences beyond the question to determine the answer. Be sure that you have read far enough ahead each time you choose an alternative.

PASSAGE I

Carving Out the Time

[1]

When winter snows slowed the work on Frank and Joseph Bily's Iowa farm, the brothers would devote more time to their true passion: clockmaking. [A] Between 1913 and 1958, the talented brothers created about forty intricate timepieces—many of them large enough to extend from floor to ceiling. The clocks were embellished with carvings of meticulously detailed scenes and lifelike figures. The Bily farm became famous because of it's clocks; thousands of visitors came each year to admire the brothers' fine craftsmanship.

[2]

The Bilys' earliest projects mimicked European clock designs—specifically the gothic Czech styles Frank and Joseph's parents had grown up with before immigrating to the United States. The Bilys' Apostles' Parade Clock is perhaps the best example of the Czech influence. [B]

1. Which choice provides new information that is relevant to the rest of the paragraph?
   A. NO CHANGE
   B. woodcarvers
   C. farmers
   D. duo

2. F. NO CHANGE
   G. by it's
   H. for its
   J. of its

Complete with music and mechanically animated figures,

a clock is reminiscent of the Czech capital's famous
___
3

Astronomical Clock. As in Prague's Astronomical Clock,

figures of twelve apostles "parade" to the front of the

clock at designated times. [C] The base of the Bilys'

clock featuring carvings of Prague's town hall and
___
4

Charles Bridge.

[3]

By the 1930s, however, the Bily brothers

had developed a style of their own. As they

shifted away from European clock themes, sharp
___
5

cathedral-like points and spires gave way to

round-topped trees and curvy leaves. ⌐6⌐ Their later

clocks reflect the Bilys' keen interest in U.S. history,
___
7

the most notable example have been the American
___
8

Pioneer History Clock. This clock—generally regarded

as the Bilys' masterpiece—has a series of panels depicting

significant historical scenes from, for example, the
___
9

American Revolution, the Oregon Trail migration and,
___
10

the California Gold Rush.

3. Which choice most clearly identifies which clock is being referred to in the paragraph?
   A. NO CHANGE
   B. this Bily clock
   C. that one
   D. that

4. F. NO CHANGE
   G. clock, featuring
   H. clock, features
   J. clock features

5. A. NO CHANGE
   B. themes, then
   C. themes, and
   D. themes;

6. If the writer were to delete the words *round-topped* and *curvy* from the preceding sentence, the sentence would primarily lose:
   F. details that help establish a contrast between the Bilys' earlier and later styles.
   G. examples of how European clock themes influenced the Bilys.
   H. information that explains why the Bilys' style changed over time.
   J. descriptions that reveal characteristics of the Bilys' earliest style.

7. A. NO CHANGE
   B. make clear and evident to an observing viewer
   C. show an indication of the existence of
   D. are proof to indicate evidence of

8. F. NO CHANGE
   G. being
   H. been
   J. to be

9. A. NO CHANGE
   B. from: for example
   C. from for example:
   D. from for example

10. F. NO CHANGE
    G. Revolution, the Oregon Trail migration, and
    H. Revolution the Oregon Trail migration, and
    J. Revolution the Oregon Trail migration and
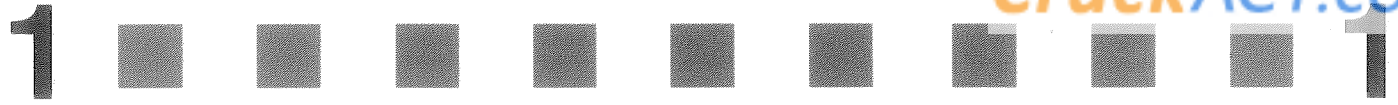
[4]

|11| Instead,

they were donated the magnificent
_____
12

timekeepers to a museum in Spillville, Iowa,

stipulating that the clocks never be sold. The
_____
13

Bily clocks remain there today, telling their

stories as time ticks on. [D]

11. Given that all the following statements are true, which one most effectively leads into the paragraph?
   A. The Bilys' interest in history is also apparent in their History of Transportation Clock.
   B. Despite receiving numerous offers, the Bily family never sold the clocks.
   C. The Bilys wanted the clocks to be viewable by the public.
   D. Frank and Joseph Bily relocated their collection in 1946.

12. F. NO CHANGE
    G. they were donated,
    H. they donated
    J. donating

13. Which of the following alternatives to the underlined portion would NOT be acceptable?
    A. with the stipulation
    B. on the condition
    C. admitting
    D. requiring

Questions 14 and 15 ask about the preceding passage as a whole.

---

14. Upon reviewing the essay and finding that some information has been left out, the writer composes the following sentence incorporating that information:

    Using tools that they'd fashioned from farming implements and household objects, Frank and Joseph spent many years developing their skills as clockmakers.

    If the writer were to add this sentence to the essay, it would most logically be placed at Point:
    F. A in Paragraph 1.
    G. B in Paragraph 2.
    H. C in Paragraph 2.
    J. D in Paragraph 4.

15. Suppose the writer's goal had been to write a profile of Frank Bily. Would this essay accomplish that goal?
    A. Yes, because it explains that Frank Bily was a farmer who made clocks.
    B. Yes, because it describes how Frank Bily and his brother Joseph became famous clockmakers.
    C. No, because it focuses more broadly on a profile of the whole Bily family.
    D. No, because it focuses more specifically on the clocks that Frank and Joseph Bily made.

PASSAGE II

A Tribute to Teococuilco

When artist Alejandro Santiago returned to his hometown of Teococuilco de Marcos Perez, Mexico, in 2000 after having been absent in France for several years, many of the familiar faces he remembered were nowhere to be seen. More than half the town's residents had left the area, primarily to seek work.

[1] Dismayed by the loss, felt both personal and cultural, Santiago responded through his art.

[2] Within the year, he established as his mission a project to symbolically repopulate Teococuilco. [3] His plan was to create human figures in clay—2,500 of them—each one unique, each one a tribute, nor an exact portrait in the traditional sense. [4] He would create one more to represent himself and in that way show his ties to those who had left and others had returned. [5] First Santiago built a workshop. [6] Then he hired local residents and taught them how to shape, glaze, and finally fire the figures in the kiln he had installed. [7] From start to finish, a single sculpture would take three days to complete. [24]

16. F. NO CHANGE
    G. departed
    H. there
    J. away

17. Which choice provides the explanation for the situation described in the first part of the sentence?
    A. NO CHANGE
    B. the place where he was born in 1964.
    C. an astonishing amount of people.
    D. located in southern Mexico.

18. F. NO CHANGE
    G. which felt
    H. they were
    J. feeling

19. A. NO CHANGE
    B. the establishment
    C. in establishing
    D. established

20. F. NO CHANGE
    G. them each—
    H. them each,
    J. them each

21. A. NO CHANGE
    B. though not
    C. neither
    D. nor as

22. F. NO CHANGE
    G. to those who
    H. they
    J. some

23. A. NO CHANGE
    B. fire,
    C. fire;
    D. fire:

24. The writer wants to divide this paragraph into two in order to separate information about Santiago's vision of the project from information about him taking practical steps to realize it. The best place to begin the new paragraph would be after:
    F. Sentence 2.
    G. Sentence 3.
    H. Sentence 4.
    J. Sentence 5.

[1] The artist expected some challenges along the way. [2] He nearly gave up, however, when a heavy rain destroyed three hundred unfired sculptures in one night. [3] The workers' efforts inspired Santiago to advance to
₂₅

the long-term project. [26]

Six years later, *2501 Migrantes*, as the artist titled the work traveled, to Monterrey, Mexico. There it had its first
₂₇

formal exhibition, even then, it was still a work in progress
₂₈
as the artist and his crew continued to add figures to the growing family of "Migrantes." Both ironically and fittingly, the sculptures have not stayed in one place: they travel in groups to various exhibition spaces. Many, though, as originally planned, are permanent residents of Teococuilco. A successful project to build on, Santiago
₂₉
envisions establishing a bronze foundry in Teococuilco

to provide jobs for residents and continuing with them
₃₀
to revitalize their beloved town.

25. A. NO CHANGE
    B. express persistence
    C. engage his efforts
    D. recommit

26. The writer wants to add the following sentence to the paragraph:

    > Santiago's crew responded to the disaster by rebuilding all the ruined figures in less than a month.

    The most logical place to add this sentence would be:
    F. before Sentence 1.
    G. after Sentence 1.
    H. after Sentence 2.
    J. after Sentence 3.

27. A. NO CHANGE
    B. work, traveled
    C. work traveled:
    D. work traveled

28. F. NO CHANGE
    G. exhibition, even then
    H. exhibition. Even then,
    J. exhibition even then,

29. A. NO CHANGE
    B. Building on the success of the project,
    C. On which to build a successful project,
    D. A project to build on successfully,

30. F. NO CHANGE
    G. in town
    H. there
    J. DELETE the underlined portion.

PASSAGE III

The New Acropolis Museum

After thirty years of being planned, designed, and built, the Acropolis Museum in Athens, Greece, opened in June 2009. It provides
₃₁
more than 150,000 square feet of exhibition space, the museum replaces a smaller one built in 1874.

31. A. NO CHANGE
    B. This new museum is providing
   C. Even though it provides
    D. Providing

The modern glass, marble, stainless steel, and concrete structure stands in striking contrast to the ancient monuments, such as the Parthenon, on the nearby Hill of the Acropolis. [32]

In collaboration with Athenian architect, Michael
Photiadis, Swiss-born architect, Bernard Tschumi designed
<u>_____</u>
33
a bright and airy, three-tiered space to display more than 4,000 treasured artifacts from ancient Greece. Construction of the new museum had barely begun, <u>however,</u> when the
34
architects encountered an unusual problem. While digging the <u>foundation, builders'</u> discovered the remains of an
35
ancient Athenian <u>neighborhood in the fourth century BC.</u>
36
Construction was halted so that the architects, engineers, and archaeologists could <u>move on.</u> Many archaeological
37
digs run into unusual circumstances. [38]

32. If the writer were to delete the words *modern*, *striking*, and *ancient* from the preceding sentence, the sentence would primarily lose details that:
   F. make clear that the design of the Acropolis Museum mimics that of a nearby monument while using contemporary building materials.
   G. reveal that the Acropolis Museum offers a greater visual contrast to nearby monuments than what museum architects had intended.
   H. emphasize the contrast between the look and design of the Acropolis Museum and that of the monuments near it.
   J. provide an overview of the shape and structure of each of the three sections of the Acropolis Museum.

33. A. NO CHANGE
   B. architect Michael Photiadis, Swiss-born architect Bernard Tschumi
   C. architect, Michael Photiadis, Swiss-born architect, Bernard Tschumi,
   D. architect Michael Photiadis, Swiss-born architect, Bernard Tschumi

34. F. NO CHANGE
   G. consequently,
   H. specifically,
   J. moreover,

35. A. NO CHANGE
   B. foundation, builders
   C. foundation builders'
   D. foundation builders

36. F. NO CHANGE
   G. neighborhood, settled with an origination of
   H. neighborhood, a settlement dating back to
   J. neighborhood settled on

37. A. NO CHANGE
   B. begin preparing for the cause of a solution.
   C. decide how to continue the project.
   D. consider getting ahead.

38. The writer is considering deleting the preceding sentence. Should the sentence be kept or deleted?
   F. Kept, because it suggests that it is as common for archaeologists as it is for builders to have to modify plans in the middle of an excavation.
   G. Kept, because it complements the paragraph's discussion of problems that may occur during a major construction project.
   H. Deleted, because it provides information that's too general to effectively contribute to the discussion in the paragraph.
   J. Deleted, because it presents a negative perspective that isn't consistent with the tone of the essay as a whole.
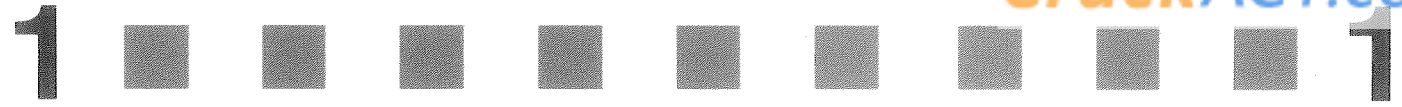
The result was an altered plan that incorporates the ongoing excavation into the building. To preserve the 43,000-square-foot site, the architects designed concrete pillars that suspend the museum over
39

the archaeological dig. When visitors enter the
40
museum, they look down through a glass floor to see the ancient streets and homes below and then climb a glass ramp lined with artifacts found during the excavation.

The second level of the museum is a gallery, filled with natural light, for displaying ancient art. The interior design is intentionally spare; Tschumi has decided to display the art this way. The
41

third level is a huge glass-walled box that, set at, an angle
42

holds treasures from the site of the Parthenon. Then,
43

visitors can enjoy panoramic views of Athens, including
44

the Acropolis. The Acropolis Museum, that is, is a
45
structure worthy of housing the greatest art of ancient Greece. And by comparison to that art, the museum will always remain "new."

39. A. NO CHANGE
B. suspensions
C. suspension
D. suspends

40. F. NO CHANGE
G. the site that would therefore be preserved.
H. that.
J. DELETE the underlined portion and end the sentence with a period.

41. Which choice provides the clearest and most specific explanation for why Tschumi created a second-level interior that is intentionally spare?
A. NO CHANGE
B. Tschumi wants the collection of objects to draw all the attention.
C. and Tschumi has designed the interior accordingly.
D. on this level Tschumi has displayed ancient art.

42. F. NO CHANGE
G. box set that, at an angle
H. box, set at an angle, that
J. box, set at an angle that

43. Which choice provides the best transition into the information that follows in the sentence by making clear that the writer is referring to the third level of the museum?
A. NO CHANGE
B. From this top section,
C. Given that,
D. On the top,

44. F. NO CHANGE
G. panoramically in
H. the panorama
J. panoramical

45. A. NO CHANGE
B. Museum, nonetheless,
C. Museum, likewise,
D. Museum

PASSAGE IV

A Hunt for Red Balloons

In December 2009, the research arm of the
U.S. Department of Defense, known as DARPA,
sponsored a high-tech scavenger hunt. For this challenge,
ten eight-foot-wide, red, weather, balloons were delivered
46

to nine states across the country tethered to the ground in
47
a public place, and sent one hundred feet into the air. The

winner would be the team to identify the latitude and
48
longitude of all ten balloons first. By the end of the

contest, many teams had competed for the prize.
49

DARPA had anticipated it would take nine

days to track down the balloons, since the team from
50
Massachusetts Institute of Technology (MIT) did

it in just under nine hours. Not even a week! Team
51

leader, Riley Crane, explained that their plan was to
52
build a system that encouraged collaboration, deliberately

spread misinformation, and offered monetary incentives.

46. F. NO CHANGE
G. ten, eight-foot-wide red weather,
H. ten eight-foot-wide red, weather
J. ten eight-foot-wide red weather

47. A. NO CHANGE
B. country, tethering them
C. country, tethered
D. country to tether

48. F. NO CHANGE
G. would have been
H. has been
J. will be

49. The writer is considering revising the underlined portion to read "4,367 teams had competed for the $40,000 prize." Should the writer make this revision?
A. Yes, because it clarifies how the scavenger hunt used technology to attract players.
B. Yes, because it makes a vague claim stronger by including specific figures.
C. No, because it adds unnecessary facts to what is supposed to be an entertaining news story.
D. No, because it makes the transition between the first two paragraphs awkward.

50. F. NO CHANGE
G. being that
H. because
J. but

51. A. NO CHANGE
B. A much shorter time period.
C. Less than nine days.
D. DELETE the underlined portion.

52. F. NO CHANGE
G. leader Riley Crane
H. leader Riley Crane,
J. leader, Riley Crane

Using e-mail, instant messaging, texting, social networking, and phone calls, information was gathered and shared by the MIT team. Their winning strategy mobilized spotters

who sometimes drove for hours to verify balloon locations. The team's incentive plan paid balloon spotters $2,000; in addition, the team offered smaller amounts to people who found the people who had found a balloon.

The balloons were red, so easily spotted. When the picture of a balloon in Rhode Island spread through the Internet like a virus, spotters raced to Providence to verify the sighting. The ruse worked, but there was no red balloon in Rhode Island, only a computer-generated decoy.

According to Dr. Regina Dugan, DARPA's director, the game had a serious purpose. To analyze the way technology can be used to share information in order to solve a problem too big for one person to solve alone. In a natural disaster, however, how quickly can the military locate twenty heavy equipment operators and dispatch them to a scene? That imagined scenario might not prove whether social networking have value beyond chatting with friends, but it does raise the question. DARPA's balloon hunt may have answered it.

53. **A.** NO CHANGE
B. gathering and sharing information was MIT's first tactic.
C. the information the MIT team had gathered was shared.
D. the MIT team gathered and shared information.

54. **F.** NO CHANGE
G. whom had sometimes driven
H. who had sometimes drove
J. who sometimes driven

55. Which choice best introduces the topic of the paragraph?
A. NO CHANGE
B. DARPA's director declared the hunt a success.
C. The balloons looked tiny from the ground.
D. Considerable tricks were played.

56. **F.** NO CHANGE
G. worked. There was
H. worked there was
J. worked

57. **A.** NO CHANGE
B. purpose, to
C. purpose: to
D. purpose to

58. **F.** NO CHANGE
G. it might be said,
H. for example,
J. first of all,

59. **A.** NO CHANGE
B. have values
C. are valued
D. has value

Question 60 asks about the preceding passage as a whole.

60. Suppose the author's primary purpose was to give a profile of an innovative team leader who led his team to a win. Would this essay accomplish that purpose?
F. Yes, because Crane is cited as the person who explained his team's strategy to win the contest.
G. Yes, because the MIT team solved the hunt for the balloons in just under nine hours.
H. No, because the essay primarily relates the story and purpose of the weather balloon hunt.
J. No, because Crane is the only MIT team member mentioned in the essay.

GO ON TO THE NEXT PAGE.

PASSAGE V

Knit One for the Home Team

[1]

Accepting that poster giveaways, free batting
helmets, and $1 hot dogs are tried-and-true ways to
coax fans to a baseball game, but newer promotions offer
"something for everyone." My home team, the Seattle
Mariners, didn't draw me with Beach Towel Day or Retro
T-shirt Night, but with Stitch N' Pitch Night at Safeco
Field, they finally got me to a Mariners game. I'd probably

be knitting, anyway, on a lazy summer evening. [A]

[2]

Before entering the stadium, I bought homespun
yarn from a huge knitting supply booth, set up by a
local shop owner, right outside the ball park. [B] I
showed my discounted "knitters' section" ticket at
the gate and began climbing the bleachers to the upper
deck. We knitters were happy to be high up in the
cheap seats. Who were the Mariners playing, again?

Let the fans who study every play have the

most covet seats behind first base. [C]

61. A. NO CHANGE
    B. Including the poster
    C. Though poster
    D. Poster

62. Which choice provides the best transition to what fol-
    lows in the paragraph and essay?
    F. NO CHANGE
    G. boys and girls weren't drawn as much as they'd
       been for Kids Run the Bases Night.
    H. I wondered what the everyday fans would think.
    J. they started a trend at ball parks.

63. A. NO CHANGE
    B. a lazy summers' evenings.
    C. a lazy summers evening.
    D. lazy summer evening's.

64. Which choice best offers a practical reason for the
    knitters being happy to be seated in the upper deck?
    F. NO CHANGE
    G. seats—actually, not many people want them.
    H. seats, safely out of the path of foul balls.
    J. seats. You know us.

65. A. NO CHANGE
    B. fans of which whom
    C. fan, those who
    D. fans whom

66. F. NO CHANGE
    G. most coveting
    H. more covet
    J. coveted
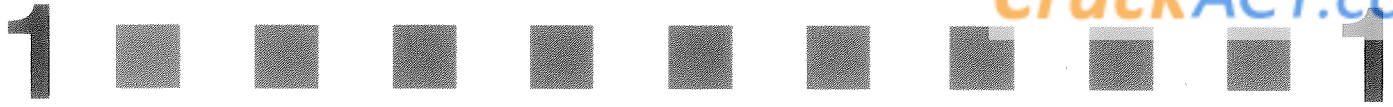
[3]

[1] Though we knitters pay more attention to pattern books than to scorecards, we wanted our team to win. [2] Then it happened. [3] We watched a pitch, knitted, watched a strike, knitted, and when a Mariner gets a hit, one or two of us would stand up
$\underline{}$
67
and cheer. [4] I knitted faster during tense plays,

studying the players' tactics and techniques, but
$\overline{}$
68
still mostly focusing on not dropping a stitch. [5] I

witnessed a dazzling catch by right fielder, Ichiro Suzuki,
$\underline{}$
69
and responded like any rowdy believer. [6] TV cameras captured my seatmates and me—unlikely fans, maybe?—surrounded by our colorful skeins of yarn, cheering wildly for Ichiro and the Mariners. [70]

[4]

I held up my unfinished scarf during the stadium wave, flashed my knitting needles with every base hit, and ate hot dogs and peanuts enjoying the game with all
$\underline{}$
71
the everyday fans. Later that night, I showed off my knitting to my friend Mia: That section was when the Mariners pulled ahead. This is my best row. Here
$\overline{}$
72
was the winning home run, when I mistakenly

did a purl stitch instead of a knit stitch. An
$\underline{}$
73
imperfect scarf but a Mariners win. [D]

67. A. NO CHANGE
    B. has gotten
    C. had got
    D. got

68. Which choice further emphasizes that the narrator has greater enthusiasm for knitting than she does for the details of the game?
    F. NO CHANGE
    G. sometimes glancing at the game,
    H. inspired by the beauty of the game,
    J. taken over by the excitement,

69. A. NO CHANGE
    B. fielder Ichiro Suzuki;
    C. fielder, Ichiro Suzuki
    D. fielder Ichiro Suzuki

70. For the sake of the logic and coherence of this paragraph, Sentence 2 should be placed:
    F. where it is now.
    G. after Sentence 3.
    H. after Sentence 4.
    J. after Sentence 6.

71. A. NO CHANGE
    B. it was as if I were included among
    C. I was like one of
    D. with all

72. Which sentence best continues the narrator's description of sections of her scarf as the sections correspond to moments of the Mariners game?
    F. NO CHANGE
    G. This scarf looks like one I knit last year—at home, not at a Mariners game.
    H. I tried a chevron pattern here, a new stitch for me.
    J. This row was when the game was tied.

73. A. NO CHANGE
    B. done a purl stitch rather than
    C. done a purl stitch instead of
    D. did a purl stitch rather then

If Safeco Field calls out again with "Come Knit One for the Home Team," I plan to inquire regarding whether Mia would like to accompany me to the event.
74
74

74. Which choice best maintains the tone of the essay while also clearly suggesting the narrator's plans if the Mariners hold another Stitch N' Pitch Night?

F. NO CHANGE
G. Mia and I will be in the cheap seats, and there will be mittens.
H. I'll see to it that something happens.
J. I wonder how many new fans will go.

Question 75 asks about the preceding passage as a whole.

---

75. The writer is considering adding the following true statement to the essay:

> The shop owner took a break from her booth to throw out the ceremonial first pitch—with a ball of yarn—and the game began.

If the writer were to add this sentence, it would most logically be placed at Point:

A. A in Paragraph 1.
B. B in Paragraph 2.
C. C in Paragraph 2.
D. D in Paragraph 4.

END OF TEST 1

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

MATHEMATICS TEST
60 Minutes—60 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

---

1. If $\frac{4}{y} = 0.4$, then $y = ?$

   A. 0.04
   B. 0.1
   C. 0.4
   D. 4
   E. 10

DO YOUR FIGURING HERE.

2. A motel manager's costs are 24% higher this year than they had been when the room rate was $60.00. If the room rate had increased by the same percent as the manager's costs, what would the room rate be this year?

   F. $68.40
   G. $70.00
   H. $72.00
   J. $74.40
   K. $78.95

3. Louis earns his regular pay of $10.00 per hour for up to 40 hours of work in a week. For each hour over 40 hours of work in a week, Louis is paid $1\frac{1}{2}$ times his regular pay. How much does Louis earn for a week in which he works 47 hours?

   A. $470.00
   B. $493.50
   C. $505.00
   D. $540.50
   E. $705.00

4. $3x^9 \cdot 5x^9$ is equivalent to:

   F. $8x^{18}$
   G. $8x^{81}$
   H. $15x^9$
   J. $15x^{18}$
   K. $15x^{81}$

DO YOUR FIGURING HERE.

5. The total surface area, T, of any right circular cone with a radius r and a slant height s, such as the cone shown below, can be determined by using the formula $T = \pi r^2 + \pi rs$. If a cone has a 3-inch radius and a 5-inch slant height, what is its total surface area, in square inches?

   A. 18π
   B. 24π
   C. 40π
   D. 75π
   E. 135π
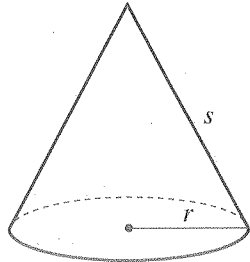
6. In the figure below, C lies on both $\overline{AE}$ and $\overline{BD}$, $\overline{AB}$ and $\overline{DE}$ are parallel and congruent, and 2 angle measures are given. What is the measure of $\angle ACB$?
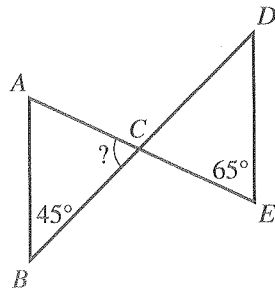
   F. $55°$
   G. $57.5°$
   H. $65°$
   J. $67.5°$
   K. $70°$

7. What is the least common denominator of the fractions $\frac{4}{35}$, $\frac{1}{28}$, and $\frac{3}{8}$?

   A.   40
   B.   280
   C.   980
   D. 1,120
   E. 7,840

8. Which of the following polynomial equations has solutions -2 and 5 ?

   F. $(x - 5)(x + 2)^2 = 0$
   G. $(x - 3)(x + 3)^2 = 0$
   H. $(x + 3)(x - 3)^2 = 0$
   J. $(x + 5)(x - 2)^2 = 0$
   K. $(x + 5)(x + 2)^2 = 0$

DO YOUR FIGURING HERE.

9. The combined length of 3 pieces of a board is 60 inches. The lengths of the pieces are in the ratio 3:5:7. What is the length, in inches, of the longest piece?

   A.   4
   B.   12
   C.   15
   D.   20
   E.   28

10. Zoe programs her calculator to evaluate a linear function, but she doesn't say what the function is. When 9 is entered, the calculator displays the value 6. When 12 is entered, the calculator displays the value 8. Which of the following expressions represents what the calculator will display when any number, n, is entered?

   F. $\frac{2}{3}n$

   G. $\frac{3}{2}n$

   H. $n - 3$

   J. $n - 4$

   K. $\frac{3}{2}n - \frac{15}{2}$

11. Points $C(2,5)$ and $D(8,11)$ lie in the standard (x,y) coordinate plane. What is the midpoint of $\overline{CD}$?

   A.   (3,8)
   B.   (5,6)
   C.   (5,8)
   D.   (6,6)
   E.   (6,8)

12. A rectangular box that is $\frac{1}{9}$ foot deep, 1 foot wide, and 1 foot long has a volume of how many cubic feet?

   F. $\frac{1}{9}$

   G.   1

   H. $2\frac{1}{9}$

   J.   9

   K.   81

13. Which of the following expressions is equal to $(3x^2 - 4x - 5) - (-x^2 + 6x + 7)$ for all real values of x ?

    A. $2x^2 - 10x - 12$
    B. $2x^2 - 10x + 2$
    C. $4x^2 - 10x - 12$
    D. $4x^2 - 10x + 2$
    E. $4x^2 + 2x + 2$

14. For all positive integers a, let E represent the sentence "a is even" and let P represent the sentence "a is prime." When $a = 22$, which of the following statements is true?

    F. Both E and P are true.
    G. If E is true, then P is true.
    H. E is true and P is false.
    J. P is true and E is false.
    K. Both E and P are false.

15. $|6(-7) + 4(8)| = ?$

    A. -144
    B. -10
    C. 10
    D. 74
    E. 144

16. In the standard (x,y) coordinate plane, what is the slope of the line $11x + 6y = 3$?

    F. -11

    G. $-\dfrac{11}{6}$

    H. $\dfrac{11}{3}$

    J. 3

    K. 11

17. A function g is defined as $g(x,y,z) = 4xy - 3xz^2$. What is $g(2,4,-3)$?

    A. -22
    B. -4
    C. 8
    D. 68
    E. 86

DO YOUR FIGURING HERE.

Use the following information to answer questions 18–21.

A family plans to remodel their kitchen. They have a total budget of $45,000 to cover expenses in 6 categories. Not all the budget has been assigned. The budget amounts that have been assigned are shown in the table below.

Expense category	Budget amount
Appliances	$ 4,000
Cabinets	$ 9,000
Flooring	$ 5,000
Lighting	$ 3,000
Labor	?
Other	?
Total budget	$45,000

18. In a circle graph illustrating the 6 budget amounts in the table, what should be the measure of the central angle of the Flooring sector?

F. 24°
G. 32°
H. 40°
J. 45°
K. 72°

19. The amount budgeted for Appliances is the sum of the prices of 5 appliances—1 refrigerator, 1 dishwasher, 1 built-in cooktop, and 2 ovens (1 conventional and 1 microwave). What is the average price per appliance?

A. $ 800
B. $1,000
C. $1,250
D. $1,800
E. $2,250

20. Suppose a bar graph will be constructed illustrating the amounts of the assigned expenses. The length of the bar for Lighting should be what fraction of the length of the bar for Cabinets?

F. $\frac{1}{15}$

G. $\frac{1}{5}$

H. $\frac{1}{3}$

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

K. $\frac{3}{4}$

**21.** Which of the following percents is closest to the percent of the total budget that remains to be assigned?

A. 21%
B. 24%
C. 40%
D. 47%
E. 53%

22. In the figure below, 5 angle measures are given. The angle marked with a measure of $y°$ is an exterior angle. What is the value of y ?
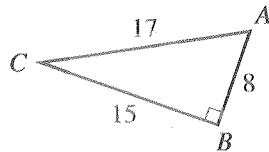

$(x + 25)°$ $(2x + 10)°$
$(3x - 25)°$ $(2x - 10)°$ $y°$
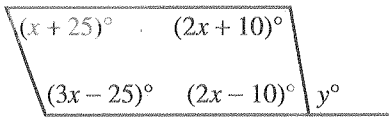
F. 22.5
G. 45
H. 80
J. 100
K. 145

23. What is the area, in square coordinate units, of parallelogram $ABCD$ shown in the standard (x,y) coordinate plane below?
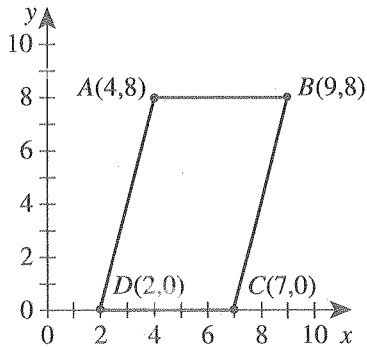
A. 14
B. 16
C. 28
D. 40
E. 45

24. Right triangle $\triangle ABC$ is shown below. The side lengths are given in centimeters. What is tan C ?

F. $\frac{8}{17}$
G. $\frac{8}{15}$
H. $\frac{15}{17}$
J. $\frac{15}{8}$
K. $\frac{17}{8}$

19

DO YOUR FIGURING HERE.

25. The system of equations below has 1 solution (a,b). What is the value of b ?

$$3a - 5b = 22$$
$$a + 3b = -2$$

A. -4
B. -2
C. 4
D. 9
E. 20

26. For his job delivering pizzas, Albert uses his own car and buys his own gas. He joined the local gas station's Frequent Fueler program that earns him points toward free gas each time he buys gas. Points are earned according to the following chart.

Frequent Fueler Program:

Sign up for the program, earn	50 points
Buy 1 gallon regular, earn	3 points
Buy 1 gallon premium, earn	4 points

At the end of his first month in the program, he received a statement showing that he had 545 points (including 50 points he received for signing up) and had purchased a total of 135 gallons of gas. To find how many gallons of premium he had purchased, he solved a system of equations with r representing the number of gallons of regular and p representing the number of gallons of premium. One equation in his system was $r + p = 135$. Which of the following could have been his other equation?

F. $3r + 4p = 495$
G. $3r + 4p = 595$
H. $4r + 3p = 495$
J. $4r + 3p = 545$
K. $4r + 3p = 595$

27. The first 2 rectangles of a sequence of rectangles are shown below. The 1st rectangle is 4 inches long and 1 inch wide. The dimensions of the 2nd rectangle, and of each successive rectangle after the 2nd, are determined by continuing the following pattern: the length is 3 inches longer than the length of the previous rectangle, and the width is 1 inch longer than the width of the previous rectangle. What is the perimeter, in inches, of the 6th rectangle in the sequence?

1st rectangle   2nd rectangle
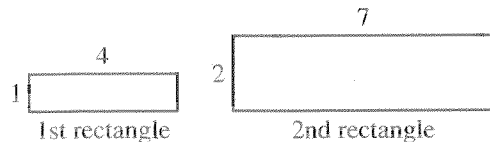
A. 24
B. 40
C. 50
D. 56
E. 60

DO YOUR FIGURING HERE.

28. Which of the expressions below is a factor of the polynomial $2x^3 + x^2 - 6x$?

    I. x
    II. $2x + 3$
    III. $x - 2$

F. I only
G. I and II only
H. I and III only
J. II and III only
K. I, II, and III

29. Shown below, a circular dartboard has 4 sectors (red, white, blue, and green) whose areas are in the ratio of 1:2:3:4, respectively. Brad will throw 1 dart at the dartboard, and it will hit the dartboard at a random point contained in 1 of the sectors. What is the probability that the sector the dart hits is NOT the blue sector?

A. $\dfrac{3}{10}$

B. $\dfrac{4}{10}$

C. $\dfrac{5}{10}$

D. $\dfrac{6}{10}$

E. $\dfrac{7}{10}$
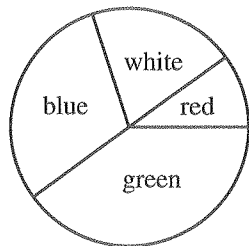
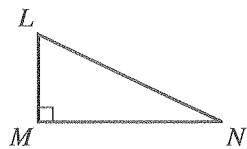30. The dimensions of equilateral triangle $\triangle ABC$ are given in centimeters in the figure below. What is the value of y ?

F. 2
G. 5
H. 8
J. 13
K. 16
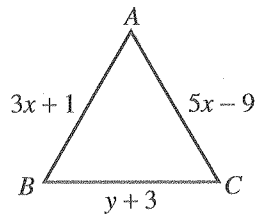
31. For right triangle $\triangle LMN$ below, $\cos L = \dfrac{7}{16}$. What is $\sin N$?

A. $\dfrac{7}{9}$

B. $\dfrac{7}{\sqrt{207}}$

C. $\dfrac{7}{16}$

D. $\dfrac{9}{\sqrt{207}}$

E. $\dfrac{9}{16}$

DO YOUR FIGURING HERE.

32. When a store sets the price of birdseed at $3.50 per pound, the store sells 2,500 pounds of birdseed per week. With each $0.25 increase in the $3.50 price per pound, the store sells 100 pounds less birdseed per week. Let n be the number of $0.25 increases in the price per pound. Which of the following expressions best represents the dollar amount of the store's weekly sales of birdseed?

F. $(3.75)(2,500 + 100n)$
G. $(3.75)(2,500 - 100n)$
H. $(2,500 + 0.25n)(100 + 3.50n)$
J. $(3.50 + 0.25n)(2,500 + 100n)$
K. $(3.50 + 0.25n)(2,500 - 100n)$

33. The circumference of a circle is 20 cm. What is the length, in centimeters, of the *radius* of the circle?

A. π

B. $\dfrac{10}{\pi}$

C. $\dfrac{20}{\pi}$

D. 20

E. 20π

34. You're on a salvage ship in the Pacific Ocean when your ship's sonar locates a shipwreck at an angle of depression of 60°, as shown in the figure below. After your ship travels 500 meters on the surface of the water to be directly over the wreck, how many meters down would you have to dive to reach the wreck?
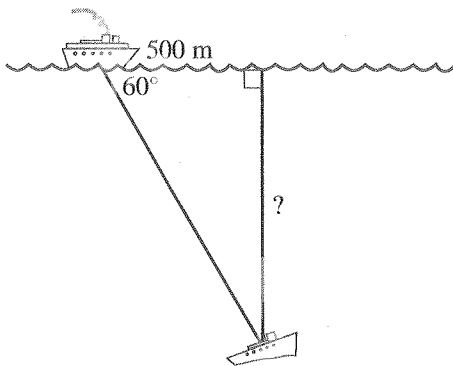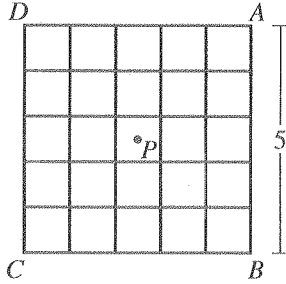

F. $\dfrac{500}{\sqrt{3}}$

G. 500

H. 1,000

J. $500\sqrt{2}$

K. $500\sqrt{3}$

DO YOUR FIGURING HERE.

Use the following information to answer questions 35–38.

Square *ABCD*, shown below, has side length 5 meters. The square is divided into 25 nonoverlapping congruent squares. Point *P* is the center of *ABCD*.

35. What is the length, in meters, of $\overline{AC}$?

- **A.** $2\sqrt{5}$
- **B.** 5
- **C.** $5\sqrt{2}$
- **D.** 20
- **E.** 25

36. The perimeter of 1 of the 25 congruent squares is how many meters?

- **F.** 1
- **G.** 4
- **H.** 5
- **J.** 20
- **K.** 25

37. Point *M* starts at *A* and is rotated counterclockwise (↺) about *P* a total of 450°. After the rotation, *M* is at the same location as which of the following points?

- **A.** *A*
- **B.** *B*
- **C.** *C*
- **D.** *D*
- **E.** *P*

38. Suppose *ABCD* is in the standard (x,y) coordinate plane such that $\overline{BC}$ is on the *x*-axis, the midpoint of $\overline{BC}$ is at the origin, *A* has positive coordinates, and 1 coordinate unit is equal to 1 meter. What are the coordinates of *D* ?

- **F.** $(-5,5)$
- **G.** $(-2.5,0)$
- **H.** $(-2.5,2.5)$
- **J.** $(-2.5,5)$
- **K.** $(0,5)$

GO ON TO THE NEXT PAGE.

39. For what value of x is the equation $\sqrt[3]{3x-9} + 10 = 13$ true?

A.   4

B.   6

C.   12

D.   576

E. $4{,}058\frac{2}{3}$

DO YOUR FIGURING HERE.

40. Ten years ago, Tara invested $2,000 at 6% interest compounded monthly. Which of the following expressions represents today's value of the investment?

F. $\$2{,}000e^{0.6}$

G. $\$2{,}000(1 + 0.06)^{10}$

H. $\$2{,}000\left(1 + \dfrac{0.06}{4}\right)^{40}$

J. $\$2{,}000\left(1 + \dfrac{0.06}{12}\right)^{120}$

K. $\$2{,}000 + \$2{,}000(0.06)(10)$

41. Which of the following is the decimal equivalent to $\dfrac{2}{7}$?

(Note: A bar indicates a digit pattern that is repeated.)

A. $0.\overline{285714}$

B. 0.28571428

C. $0.28571\overline{428}$

D. 0.2857142857

E. $0.2857142\overline{857}$

42. Ms. Simons made a bar graph of the 20 scores on the last math test, as shown below. Which of the following statements about the mean of the 20 scores is true?
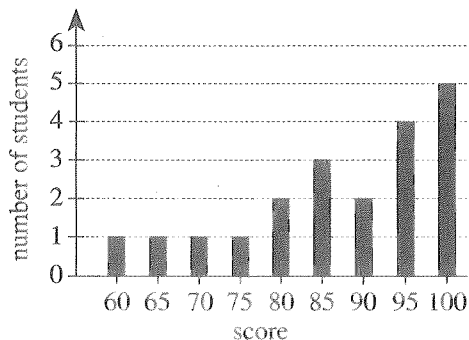
F.   The mean is less than 75.
G.   The mean is 75.
H.   The mean is between 75 and 85.
J.   The mean is 85.
K.   The mean is greater than 85.

43. To plan orders for a party, a caterer uses the formula $P = \frac{64G}{S}$, where P is the number of people, G is the number of gallons of punch, and S is the size of the cups in ounces. Which of the following gives the number of gallons of punch to order for a party of 200 people when 5-ounce cups will be used?

A. $\frac{(5)(64)}{200}$

B. $\frac{(5)(200)}{64}$

C. $\frac{(64)(200)}{5}$

D. $\frac{64}{(5)(200)}$

E. $\frac{200}{(5)(64)}$

44. Linh has $3.67 in quarters ($0.25), dimes ($0.10), nickels ($0.05), and pennies ($0.01). She arranges these coins in rows and notices that there are 5 more dimes than quarters, 1 more nickel than quarters, and 25 more pennies than quarters. How many pennies does Linh have?

F. 7
G. 12
H. 25
J. 31
K. 32

45. Consider the transformation of the standard (x,y) coordinate plane that maps each point (x,y) to the point (kx,ky) for a certain positive constant, k. In particular, this transformation maps (3,9) to (1,3). This transformation maps (9,24) to which of the following points?

A. (3, 8)
B. (6,21)
C. (7,18)
D. (11,30)
E. (27,72)

46. Lindsay is designing a 5-foot-by-8-foot rectangular poster for her art class. She will cover both diagonals of the poster with straight lengths of yellow rope. Which of the following values is closest to the total length, in feet, of the 2 yellow ropes Lindsay will need for the poster?

F. 19
G. 20
H. 23
J. 26
K. 40

47. Robert writes a check for $20. When he records the check in his check register, he accidentally *adds* $20 to his balance instead of subtracting $20, which causes a discrepancy between what Robert's check register shows and what it should show. Because of his mistake, Robert's check register shows:

A. $40 less than it should.
B. $20 less than it should.
C. $10 more than it should.
D. $20 more than it should.
E. $40 more than it should.

48. For a certain location in Grand Canyon National Park, the highest temperature on record is 120°F and the lowest temperature on record is −18°F. Which of the statements below is necessarily true about the temperatures on record for this location?

    I. The range of temperatures is 138°F.
    II. The range of temperatures is 102°F.
    III. The median temperature is 69°F.

F. I only
G. II only
H. III only
J. I and III only
K. II and III only

49. The graph of $y = \dfrac{2x - 5}{x + 3}$ in the standard (x,y) coordinate plane has a vertical asymptote with equation $x = $?

A. -3
B. $-\dfrac{5}{3}$
C. 2
D. $\dfrac{5}{2}$
E. 8

50. What fraction of a 6-inch-diameter pizza contains the same amount of pizza as 1 slice of a 12-inch-diameter pizza of the same thickness cut into 12 equal slices?

F. $\dfrac{1}{4}$
G. $\dfrac{1}{3}$
H. $\dfrac{1}{2}$
J. $\dfrac{2}{3}$
K. 1

51. For what real value of x is $\dfrac{3^x 3^4}{\left(3^4\right)^5} = \dfrac{1}{9}$ true?

A. 3
B. 5
C. 11
D. 14
E. 16

DO YOUR FIGURING HERE.

52. What are all real values of m, if any, such that any line through the points $(3,7)$ and $(3,m)$ will be vertical when graphed in the standard (x,y) coordinate plane?

F. -7
G. 3
H. All real numbers satisfy this condition.
J. All real numbers except 7 satisfy this condition.
K. No real numbers satisfy this condition.

53. Green Camp and Blue Camp lie on opposite sides of Red Lake. A boat dock is located 1,000 yards from Green Camp. The campers estimated the angles between these 3 locations to be as shown on the map below. Using these estimates, which of the following expressions gives the distance, in yards, between Green Camp and Blue Camp?
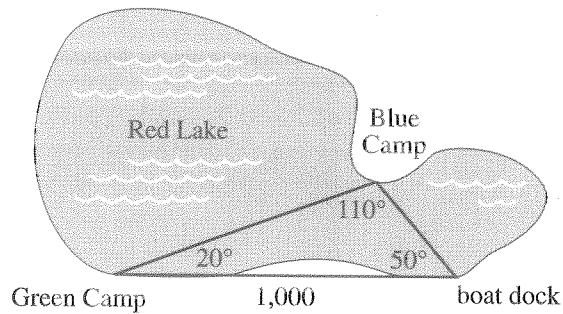
A. $\dfrac{5,000}{11}$

B. $\dfrac{1,000}{\cos 20°}$

C. $\dfrac{1,000}{\sin 110°}$

D. $\dfrac{1,000 \sin 50°}{\sin 110°}$

E. $1,000 \tan 50°$

54. The graphs of the functions $y = f(x) = (x-3)^2 + 2$ and $y = g(x) = \frac{1}{2}x + \frac{1}{2}$ are shown in the standard (x,y) coordinate plane below. Which of the following is NOT true?

F. $|f(x)| = f(x)$

G. $|g(x)| = g(x)$

H. $f(3) = g(3)$

J. $f\left(3\frac{1}{2}\right) = g\left(3\frac{1}{2}\right)$

K. $f(g(1)) = 6$

DO YOUR FIGURING HERE.
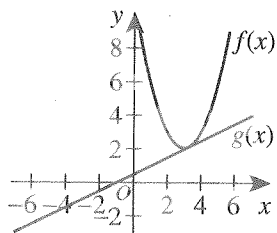
55. When $3 \leq x \leq 5$ and $7 \leq y \leq 9$, the smallest possible value for $\dfrac{2}{y-x}$ is:

A. $\dfrac{7}{9}$

B. $\dfrac{1}{6}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{3}$

E. $\dfrac{1}{2}$

56. In the standard (x,y) coordinate plane below, θ is the radian measure of any angle in standard position with the point (r,s) on the terminal side. Which of the following points is on the terminal side of the angle in standard position having radian measure $\pi - \theta$?
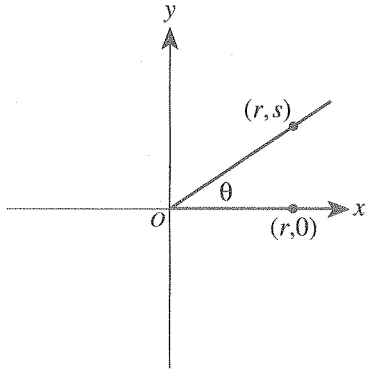
F. $(-r,\ s)$
G. $(\ r,-s)$
H. $(-s,-r)$
J. $(-s,\ r)$
K. $(\ s,-r)$

57. Which of the following matrices is equal to the matrix product $\begin{bmatrix} 2 & -5 \\ -3 & 4 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ -1 \end{bmatrix}$?

A. $\begin{bmatrix} 4 & 5 \\ -6 & -4 \end{bmatrix}$

B. $\begin{bmatrix} 4 & -3 \\ -4 & 3 \end{bmatrix}$

C. $\begin{bmatrix} 4 & -10 \\ 3 & -4 \end{bmatrix}$

D. $\begin{bmatrix} -1 \\ -2 \end{bmatrix}$

E. $\begin{bmatrix} 9 \\ -10 \end{bmatrix}$

58. In the figure below, $\overline{BC}$ is parallel to $\overline{AD}$, E is the midpoint of $\overline{AB}$, F is the midpoint of $\overline{CD}$, G is the midpoint of $\overline{AE}$, and H is the midpoint of $\overline{FD}$. The lengths marked are in inches. What is the length of $\overline{GH}$, in inches?
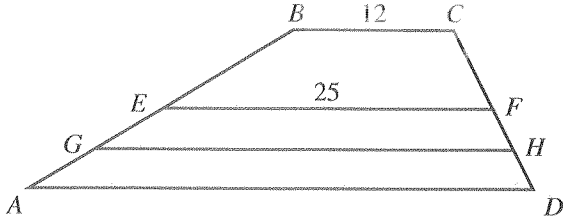
F. 31

G. $31\frac{1}{2}$

H. 37

J. 38

K. $43\frac{1}{2}$

59. Suppose that a will be randomly selected from the set $\{-3, -2, -1, 0, 1\}$ and that b will be randomly selected from the set $\{-2, -1, 0, 1\}$. What is the probability that $ab > 0$?

A. $\dfrac{3}{200}$

B. $\dfrac{1}{20}$

C. $\dfrac{3}{10}$

D. $\dfrac{7}{20}$

E. $\dfrac{3}{5}$

60. Distinct points A, B, C, and D are collinear, and B is between A and C. For D to be between A and C such that $AD + DB + BC = AC$, which of statements I–IV below *must* be true?

(Note: If B is between A and C, then $AB + BC = AC$.)

　　I. $AD = DB$
　II. $AD = BC$
　III. B is between D and C
　IV. D is between B and C

F. I only

G. III only

H. I and III only

J. II and IV only

K. None of the statements must be true.

DO YOUR FIGURING HERE.

END OF TEST 2

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

DO NOT RETURN TO THE PREVIOUS TEST.

READING TEST

35 Minutes — 40 Questions

DIRECTIONS: There are several passages in this test. Each passage is accompanied by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

Passage I

PROSE FICTION: This passage is adapted from the novel *Stones for Ibarra* by Harriet Doerr (©1984 by Harriet Doerr).

Here they are, two North Americans, a man and a woman just over and just under forty, come to spend their lives in Mexico and already lost as they travel cross-country over the central plateau. The driver of the
5 station wagon is Richard Everton, a blue-eyed, black-haired stubborn man. On the seat beside him is his wife, Sara. She pictures the adobe house where they intend to sleep tonight. It is a mile and a half high on the outskirts of Ibarra, a declining village of one thousand
10 souls. Tunneled into the mountain is the copper mine Richard's grandfather abandoned fifty years ago during the Révolution of 1910.

Dark is coming on and, unless they find a road, night will trap at this desolate spot both the future oper-
15 ator of the Malagueña mine and the fair-haired unsuspecting future mistress of the adobe house. Sara Everton is anticipating their arrival at a place curtained and warm, though she knows the house has neither electricity nor furniture and, least of all, kindling beside
20 the hearth. There is some doubt about running water in the pipes. The Malagueña mine, on the other hand, is flooded up to the second level.

"Let's stop and ask the way," says Sara. And they take a diagonal course across a cleared space of land.
25 But the owner of this field is nowhere in sight.

"We won't get to Ibarra before dark," says Sara. "Do you think we'll recognize the house?"

"Yes," he says, and without speaking they separately recall a faded photograph of a wide, low struc-
30 ture with a long veranda in front. On the veranda is a hammock, and in the hammock is Richard's grandmother, dressed in eyelet embroidery and holding a fluted fan.

Five days ago the Evertons left San Francisco in
35 order to extend the family's Mexican history and patch the present onto the past. To find out if there was still copper underground and how much of the rest of it was true, the width of the sky, the depth of the stars, the air like new wine. To weave chance and hope into a fabric
40 that would clothe them as long as they lived.

Even their closest friends have failed to understand. "Call us when you get there," they said. "Send a telegram." But Ibarra lacks these services. "What will you do for light?" they were asked. And, "How long
45 since someone lived in the house?" But this question collapsed of its own weight before a reply could be composed.

Every day for a month Richard has reminded Sara, "We mustn't expect too much." And each time his wife
50 answered, "no." But the Evertons expect too much. They have experienced the terrible persuasion of a great-aunt's recollections and adopted them as their own. They have not considered that memories are like corks left out of bottles. They swell. They no longer fit.

55 Now here, lost in the Mexican interior, Richard and Sara remember the rock pick Richard's grandfather gave him when he was six. His grandfather had used the pick himself to chip away copper ore from extrusions that coursed like exposed arteries down the slopes
60 of the mountains.

"What does he know about mining?" Richard's friends have asked one another. "What does she know about gasoline stoves? In case of burns, where will they find a doctor?" The friends learn that the Evertons are
65 taking a first aid manual, antibiotics for dysentery, and a snakebite kit. There are other questions relating to symphony season tickets, Christmas, golf, sailing. To these, the answers are evasive.

A farmer, leading a burro, approaches the car from
70 behind. He regards the two Americans. "You are not on the road to Ibarra," he says. "Permit me a moment." And he gazes first at his feet, then at the mountains, then at their luggage. "You must drive north on that dry arroyo for two kilometers and turn left when you reach
75 a road. You will recognize it by the tire tracks of the morning bus unless rain has fallen. But this is the dry season."

"Without a tail wind we won't be bothered by the dust," says Richard, and turns north.

80 He is mistaken. The arroyo is smooth and soft with dust that, even in still air, spins from the car's wheels and sifts through sealed surfaces, the flooring, the dashboard, the factory-tested weather stripping. It etches black lines on their palms, sands their skin, powders
85 their lashes, and deposits a bitter taste on their tongues.

"This must be the wrong way," says Sara, from under the sweater she has pulled over her head.

Richard says nothing. He knows it is the right way, as right as a way to Ibarra can be, as right as his deci-
90 sion to reopen an idle mine and bring his wife to a house built half of nostalgia and half of clay.

1. The passage is told from what point of view?
   A. First person, narrated by a minor character
   B. First person, narrated by a main character
   C. Third person, narrated by a voice outside the action of the story
   D. Third person, narrated through the perspective of one character

2. What does the passage suggest about how many, if any, preceding visits the Evertons have made to Ibarra?
   F. They have visited Ibarra before, but not for several years.
   G. They have been to Ibarra regularly to visit Richard's grandmother.
   H. They visited Ibarra once before to examine the Malagueña mine.
   J. They have not been to Ibarra prior to this visit.

3. The main point made in the eighth paragraph (lines 48–54) is that:
   A. when everything is carefully planned, there's no risk of disappointment.
   B. older relatives should not try to persuade family members to change lifestyles.
   C. people cannot live on their own memories but should instead look to the future.
   D. it's unwise to form expectations based on other people's enticing stories of another time.

4. Based on the passage, how does the house in Sara's thoughts most likely compare to the actual house where the Evertons plan to sleep?
   F. Sara's imagined house is much more inviting than the actual house.
   G. Sara pictured a house that's nearly a perfect copy of the actual house.
   H. The actual house is much grander than Sara is imagining.
   J. The actual house is just as uninviting as the house in Sara's imagination.

5. It could most reasonably be considered ironic that while Richard and Sara's copper mine:
   A. is located on the side of a mountain, they get lost traveling cross-country to Ibarra.
   B. was abandoned in 1910, Sara still remembers the rock pick Richard was given when he was six.
   C. is located near the village of Ibarra, no one has lived in the house for several years.
   D. is flooded to the second level, the house is likely to be without running water.

6. Richard thinks he and Sara will recognize the house where they intend to sleep because:
   F. it's made of adobe.
   G. Richard's grandmother described it to them.
   H. they have seen an old photograph of it.
   J. it's the only house with a veranda.

7. As it is used in line 37, the phrase "the rest of it" refers to the:
   A. amount of copper still left to be dug out of the mine.
   B. stories that Richard and Sara have heard about the natural appeal of the region.
   C. town of Ibarra that Richard is anxious to find out more about.
   D. close friends they left behind along with their old lives in San Francisco.

8. The services mentioned in line 43 specifically refer to:
   F. symphony tickets and sailing excursions.
   G. medical aid and antibiotics.
   H. electricity and running water.
   J. telephone calls and telegrams.

9. The list "symphony season tickets, Christmas, golf, sailing" (line 67) is a reference to Richard and Sara's:
   A. unwillingness to spend money frivolously.
   B. concerns about heading for Ibarra.
   C. recreational opportunities in Mexico.
   D. former social lives in San Francisco.

10. According to the passage, the farmer tells the Evertons that it's the dry season to make the point that the:
    F. tire tracks of the bus should still be visible on the road.
    G. drive to Ibarra will be hot and dusty.
    H. Evertons should reach Ibarra before it begins to rain.
    J. Evertons should have brought drinking water with them.

Passage II

SOCIAL SCIENCE: This passage is adapted from the article "Reviving the Lost Art of Naming the World" by Carol Kaesuk Yoon (©2009 by The New York Times Company).

Despite the field of taxonomy's now blatant modernity, with practitioners using DNA sequences, sophisticated evolutionary theory and supercomputers to order and name all of life, jobs for taxonomists con-
5 tinue to be in steady decline. The natural history collections crucial to the work are tossed.

Outside taxonomy, no one is much up in arms about this, but perhaps we should be, because the ordering and naming of life is no esoteric science. The past
10 few decades have seen a stream of studies that show that sorting and naming the natural world is a universal, deep-seated and fundamental human activity, one we cannot afford to lose because it is essential to understanding the living world, and our place in it.

15   Anthropologists were the first to recognize that taxonomy might be more than the science officially founded by Carl Linnaeus, the Swedish botanist, in the 1700s. Studying how nonscientists order and name life, creating what are called folk taxonomies, anthropolo-
20 gists began to realize that when people across the globe were creating ordered groups and giving names to what lived around them, they followed highly stereotyped patterns, appearing unconsciously to follow a set of unwritten rules. Not that conformity to rules was at first
25 obvious to anthropologists who were instead understandably dazzled by the variety in folk taxonomies. The Ilongots, for example, a people of the Philippines, name gorgeous wild orchids after human body parts. There bloom the thighs, there fingernails, yonder
30 elbows and thumbs. The Rofaifo people of New Guinea classify the cassowary, a giant bird complete with requisite feathers and beak, as a mammal. In fact, there seemed, at first glance, to be little room even for agreement among people, let alone a set of universally fol-
35 lowed rules. More recently, however, deep underlying similarities have begun to become apparent.

Cecil Brown, an anthropologist who has studied folk taxonomies in 188 languages, has found that people recognize the same basic categories repeatedly,
40 including fish, birds, snakes, mammals, "wugs" (meaning worms and insects), trees, vines, herbs and bushes.

Dr. Brown's finding would be considerably less interesting if these categories were clear-cut depictions of reality that must inevitably be recognized. But tree
45 and bush are hardly that, since there is no way to define a tree versus a bush. The two categories grade insensibly into one another. Wugs, likewise, are neither an evolutionarily nor ecologically nor otherwise cohesive group. Still, people repeatedly recognize and name
50 these oddities.

Likewise, people consistently use two-word epithets to designate specific organisms within a larger group of organisms, despite there being an infinitude of

potentially more logical methods. It is so familiar that it
55 is hard to notice. In English, among the oaks, we distinguish the pin oak, among bears, grizzly bears. When Mayan Indians, familiar with the wild piglike creature known as peccaries, encountered Spaniards' pigs, they dubbed them "village peccaries." We use two-part
60 names for ourselves as well: Sally Smith or Li Wen. Even scientists are bound by this practice, insisting on Latin binomials for species.

There appears to be such a profound unconscious agreement that people will even concur on which exact
65 words make the best names for particular organisms. Brent Berlin, an ethnobiologist at the University of Georgia, discovered this when he read 50 pairs of names, each consisting of one bird and one fish name, to a group of 100 undergraduates, and asked them to
70 identify which was which. The names had been randomly chosen from the language of Peru's Huambisa people, to which the students had had no previous exposure. With such a large sample size—there were 5,000 choices being made—the students should have
75 scored 50 percent or very close to it if they were blindly guessing. Instead, they identified the bird and fish names correctly 58 percent of the time, significantly more often than expected for random guessing. Somehow they were often able to intuit the names' birdiness
80 or fishiness.

Some researchers hypothesize that there might be a specific part of the brain that is devoted to the doing of taxonomy. Without the power to order and name life, a person simply does not know how to live in the
85 world, how to understand it. How to tell the carrot from the cat—which to grate and which to pet? To order and name life is to have a sense of the world around, and, as a result, what one's place is in it.

11. The primary function of the statement in lines 35–36 is to:
   A. signal a shift in the direction of the discussion.
   B. summarize the main idea of the third paragraph (lines 15–36).
   C. define a new anthropological term.
   D. anticipate and refute a counterargument.

12. Which of the following hypotheses does the passage introduce but not elaborate on?
   F. A particular part of the brain might be devoted to the ordering and naming of life.
   G. Taxonomy might be more than the science founded by Linnaeus.
   H. Basic ways of categorizing organisms might be similar across cultures.
   J. Prior to Linnaeus's taxonomy, animals might have been categorized based on how they moved.

13. The main idea of the second paragraph (lines 7–14) is that:

   A. surveys have shown that the number of taxonomy experts has declined in the past few decades.
   B. natural history collections should be preserved and made accessible.
   C. taxonomy is no esoteric science because it is so widely studied.
   D. we should be concerned about the state of taxonomy because it is vital to all of us.

14. The passage refers to the Ilongots and the Rofaifo people primarily to:

   F. provide examples of some variances that anthropologists observed in taxonomies.
   G. illustrate that categories such as bird and mammal are common in taxonomies.
   H. support the claim that anthropologists were the first to recognize the importance of taxonomy.
   J. expose the underlying similarities among the taxonomies of different cultures.

15. As it is used in the passage, the term *wugs* most nearly refers to:

   A. an oddity recognized in only a few cultures' taxonomies.
   B. species that are usually named with more than two-word labels.
   C. a noncohesive group consisting of worms and insects.
   D. miscellaneous species that Linnaeus couldn't fit in another category.

16. According to the passage, using two-word labels to name organisms is a practice that:

   F. was introduced by Linnaeus.
   G. has been abandoned by taxonomists.
   H. is common across cultures.
   J. was initiated by anthropologists.

17. The passage draws which of the following conclusions based on Berlin's experiment?

   A. Random guessing yields a correct answer at least 58 percent of the time.
   B. Languages share recognizable and somewhat similar characteristics in names of organisms.
   C. Bird and fish names can't be identified more than 50 percent of the time in most languages.
   D. Most of the words in the language of Peru's Huambisa people are similar to English words.

18. The first paragraph indicates that the number of taxonomy jobs has decreased despite:

   F. recent discoveries of numerous unnamed species.
   G. technological advances in the field of taxonomy.
   H. the need to correct longstanding errors in Linnaeus's work.
   J. anthropologists' interest in collaborating with taxonomists.

19. It can most reasonably be inferred from the passage that the author regards natural history collections as being:

   A. not worth the expense of maintaining.
   B. outdated and therefore ready to be tossed.
   C. essential for the work of taxonomists.
   D. crucial to Berlin's ethnobiology research.

20. The passage most strongly suggests that one of the reasons Berlin chose the language of Peru's Huambisa people for use in his experiment was that:

   F. the language doesn't use a binomial system to name organisms.
   G. his test subjects wouldn't have been exposed to the language.
   H. the language has roughly the same number of words for birds as it does for fish.
   J. his test subjects would be able to learn the language quickly.

Passage III

Passage A by Joanna Smith Rakoff

I knew, I suppose, that Salinger was a recluse, but I didn't understand the extent of his removal from society, in general, and the realms of literature and publishing, specifically. Nor did I understand—naive as this
5 sounds—the cultlike devotion of his fans.

At Harold Ober Associates, a literary agency, we were Salinger's gatekeepers—charged with protecting his life and work. We had to believe that Salinger's privacy was the most important thing in the world, to be
10 protected at all costs.

During my first months on the job, Salinger remained a comfortably abstract concept. Then, in June, he called, anxious to speak to Phyllis Westberg, the company's president. My stomach lurched a little when
15 I realized that it was Salinger, for real, on the other end of the phone.

It turned out something momentous was afoot in Salingerland: Eight years earlier, a small publisher in Alexandria, Virginia, had written to him, asking
20 whether they might put out a book consisting solely of Salinger's novella *Hapworth 16, 1924*, which had appeared in *The New Yorker* magazine in 1965. To the shock of Phyllis, Salinger had, after years of thought, decided that this "fellow in Virginia" could publish
25 *Hapworth*. Suddenly, he was calling all the time, anxious about the details of this new deal, which seemed like it might mark a tentative re-entry into the world he'd abandoned 30 years earlier. Ober, just as suddenly, seemed charged with a frenetic energy. Phyllis bustled
30 around the office and had long conversations with Salinger, going over the details of the new book, from the cloth of the binding to the font to the paper stock. She asked him about the publisher, a retired professor, whom Salinger seemed to like very much, to Phyllis'
35 surprise. It was not often, I supposed, that Salinger took a shine to someone new. In a way, I realized, the Virginia publisher was simply one of the fans whose letters I fielded, one who had managed to break through the wall of Ober's protectorate and prove to Salinger
40 that, yes, they really were kindred spirits.

The Hapworth book never materialized. The publisher gave an interview about Salinger to a local magazine, and Salinger decided his new friend was a phony after all.

Passage B by Roger Lathbury

45 It was 1988, and I had written to J. D. Salinger with a proposal: I wanted my tiny Virginia publishing house, Orchises Press, to publish his novella *Hapworth 16, 1924*. And Salinger himself had improbably written in reply, saying that he would consider it. I was
50 ecstatic, even if I doubted that he'd proceed. And then, silence.

Eight years went by. In May of 1996, I received a letter from Phyllis Westberg saying that Mr. Salinger would soon write to me.

55 Why had he said yes? I think he chose me because I didn't chase him. I had left him alone for eight years; I wasn't pushy in the commercial way he found offensive.

Two weeks later, a full-page letter arrived, and it
60 took my breath away. Chatty, personal, it expressed Salinger's high pleasure in finding a way to put out *Hapworth*.

Well into discussions about the deal, I unwittingly made the first move that would unravel the whole thing.
65 I applied for Library of Congress Cataloging in Publication data.

It sounds innocent. CIP data are the information printed on the copyright page. The filings are public information, but I didn't imagine that anyone would
70 notice one among thousands.

Then I made another, bigger mistake. What I know now, but did not then, was that CIP listings are not only public but also appear on Amazon.com. Someone spotted *Hapworth* there, and his sister was a reporter for a
75 local paper in Arlington. She telephoned.

It seems clear now how everything happened. She asked me basic questions. Foolishly—if reasonably—I answered most of them. I thought I could control myself, but my ego came into play. Anyway, what harm
80 could it do? This was a tiny paper.

Then someone at *The Washington Post* saw it and called. I refused to speak at first, then answered a few questions, nervously.

After the story appeared in the *Post*, my phone
85 nearly exploded. Newspapers, magazines, television stations, book distributors, strangers, foreign publishers, movie people. South Africa, Catalonia, Australia. The only one who didn't call me was Salinger. I couldn't proceed without him, because we still had
90 too many details unsettled.

I yearned to write to Salinger, but I knew that it would do no good. He must have been furious with me, for betraying him by leaking news to the press, or even confirming it. I could no longer be trusted. I had proven
95 myself part of the crass, opportunistic world that Salinger's heroes disdain.

Questions 21–23 ask about Passage A.

21. It can most reasonably be inferred from Passage A that before Rakoff began working at Harold Ober Associates, she:

  A. was a fan of Salinger's work and took the job in hopes of meeting Salinger.

  B. knew Salinger himself but was unaware of his fame and unfamiliar with *Hapworth 16, 1924*.

  C. knew of Salinger but did not realize the extent of his reclusiveness nor the depths of his fame.

  D. had read *Hapworth 16, 1924*, and hoped to help publish it again.

22. Which of the following is a detail from Passage A that best supports the idea that Salinger was removed from the realms of literature and publishing?

  F. Salinger didn't want to be bothered reading letters from fans.

  G. Salinger had resorted to publishing his writing in magazines like *The New Yorker*.

  H. Salinger had not published any work in thirty years.

  J. Salinger was anxious about going over the details of publishing his book with Westberg.

23. Regarding the publication of *Hapworth 16, 1924*, Passage A makes clear that the text was:

  A. published by a small Virginia company thirty years after Salinger had written it.

  B. about to be published in *The New Yorker* when Salinger decided he wanted it in book form.

  C. once published in book form, but the book is no longer in print.

  D. once published in *The New Yorker*, but a later deal to publish it in book form fell apart.

Questions 24–27 ask about Passage B.

24. Based on Passage B, Lathbury's reaction to Salinger's first letter was:

  F. elation, but also doubt about whether Salinger would actually proceed with the deal.

  G. amusement, but also suspicion that someone claiming to be Salinger had written the letter.

  H. optimism; he was certain that Salinger would agree to a business proposition regarding his novella.

  J. anxiety; he was concerned that his tiny publishing house couldn't handle a book deal with Salinger.

25. According to Lathbury, the tone of Salinger's second letter can best be described as:

  A. stilted and reticent.

  B. informal and friendly.

  C. clear but patronizing.

  D. agreeable but hesitant.

26. It can most reasonably be inferred from Passage B that Lathbury responded to the first interviewer's questions in part because he:

  F. believed the questions were in-depth and thought provoking.

  G. hoped the article would increase demand for Salinger's other books.

  H. was proud of having made a book deal with Salinger.

  J. was related to the interviewer and wanted to give her the story.

27. Lines 89–90 most nearly mean that Lathbury:

  A. felt uncertain about his friendship with Salinger and wanted to hear from him again.

  B. was worried about Salinger's reaction to the interviews Lathbury had given.

  C. couldn't publish the book without further discussions with Salinger.

  D. had a lot of unanswered questions about Salinger's life.

Questions 28–30 ask about both passages.

28. Which statement most accurately compares the content of the two passages?

  F. Both focus on philosophical reasons for Salinger's withdrawal from the public eye.

  G. Both use the same stories about Salinger to explain how he changed over time.

  H. Both describe Salinger's devoted fans but offer different reasons for his fame.

  J. Both give an insider's account of an incident involving Salinger but tell the story from a different angle.

29. Based on the passages, it's most likely that Rakoff and Lathbury would agree that giving interviews about Salinger was:

  A. ill-advised; Salinger avoided publicity and didn't want others speaking about him.

  B. aggravating; reporters exaggerated facts about Salinger no matter what was said in the interview.

  C. profitable; Salinger would finish writing a book more quickly when people were anticipating it.

  D. clever; good publicity was a way to inflate Salinger's ego so he'd be cooperative.

30. It can most reasonably be inferred from the passages that "the Virginia publisher" referred to in lines 36–37 is:

  F. Roger Lathbury.

  G. Phyllis Westberg.

  H. Joanna Smith Rakoff.

  J. Harold Ober Associates.

Passage IV

Only a few millimeters long, rock ants (*Temnothorax albipennis*) prove difficult to track in the wild but excellent for the tabletop world of the laboratory.

When something terrible happens to a rock ant
5 home, such as a researcher lifting off the roof, the majority of ants cluster in the ruins. A quarter to a third of the colony scurries out looking for new possibilities.

"I think of the ants as a sort of search engine," ant biologist Nigel Franks says. In one set of tests, he and
10 his students disrupted a nest and watched to see what the ants would make of a series of new possibilities that improved with distance. The best nest was almost three meters distant, nine times as far from the original home as a nearby but less appealing choice. "It was just such
15 fun doing this experiment because the ants won," Franks says.

In spite of the epic distances, the ants typically found and agreed to move into the best nest. "They're fantastic at it," Franks says.

20 Franks and Elva Robinson, both of the University of Bristol, monitored rock ants by fitting them with radio-frequency identification tags. The data suggest that each scout follows a simpler rule than previously thought, Robinson, Franks and their colleagues
25 reported online in *Proceedings of the Royal Society B.*

Instead of making direct comparisons between sites, a scout follows a threshold rule. If she finds a poor site, she keeps searching. When she finds a site that exceeds her "good enough" threshold, she returns
30 to the original nest.

Next, previous work shows, the scout recruits a new scout to join her on a trek to the good site. She dashes around tapping her antennae on other ants and releasing a pheromone from her sting gland, explains
35 Stephen Pratt of Arizona State University in Tempe. Usually she finds a volunteer within a minute or so, and the two set off tandem running.

Scout A, who knows the way, runs back toward the nest while her follower, B, jogs closely enough to tap
40 antennae against the leader. Should A sprint a little too fast and dash beyond antennae range, she slows until her partner catches up. Periodically the two ants stop, and the newbie looks around as if learning landmarks. It's a slow way to get to the site, and Franks argues that
45 it qualifies as animal teaching.

When the ants do reach the possible site, the recruit explores it and, depending on her assessment, returns to recruit yet another scout.

As with bees, it's the quorum of scouts at the sites
50 that matters. When enough of them gather at a particular place to encounter each other at a sufficiently high rate, they've got a decision.

Once scouts reach that decision, their behavior changes. Each scout dashes back to the nest, but instead
55 of coaxing a nest mate for a tour, she just grabs somebody. She uses a mouthpart hook, an over-the-shoulder throw, and off she goes with the passive nest mate curled on her back in an ant version of the fetal position. Carrying takes about a third as long as leading
60 would, and scouts can haul the rest of the colony to a new home within hours. The ants shift from the independent info gathering of scouts to group implementation of the quorum's decision.

Rock ants' willingness to thrive in the lab allows
65 experiments on finer points of collective decision making, Pratt says. For example, forcing a crisis among the ants demonstrates that they will, in a pinch, trade accuracy for speed. When researchers destroy an old nest so that ants are completely exposed, the ants scope
70 and relocate within hours. Other experiments that just offer the ants a better nest but don't ruin their current one can result in days of deliberation. Speed has its costs, and ants in a hurry now and then make mistakes, such as splitting the colony between two nests. Slower
75 moves prove more accurate.

The quorum system could be widespread in group behavior in nature, Pratt says. Overall it's a beautiful tool, allowing for carefully balanced independence plus some shortcut speed. Yet the system "has a dark side,"
80 he acknowledges. Once individuals have made their independent assessments and then a quorum has reached agreement, fellows copy the quorum behavior. The chances are low that the whole quorum will reach the same wrong decision. But flukes can happen. In
85 most uses of a quorum, "it's going to make a decision more accurate," he says, "but it also slightly increases the incidence of these rare events when you get it really spectacularly wrong."

31. The passage makes clear that a main objective of the research of Franks and Robinson was to:

A. determine the properties of rock ant scouts' pheromones.
B. destroy rock ant habitats in the laboratory.
C. observe the behavior of rock ant scouts in the wild.
D. study the decision making of rock ant scouts.

32. In the passage, Franks reacts to his findings regarding the behavior of rock ants with what could best be described as:

F. frustration and impatience.
G. surprise and confusion.
H. concern and empathy.
J. amusement and admiration.

33. Based on the passage, an example of rock ants working as "a sort of search engine" (line 8) would be:

A. a colony selecting one scout ant to find the best site for a new nest.
B. a third of a colony deciding to nest at a nearby but somewhat deficient site.
C. several ants bypassing a poor nest site for the purpose of finding a better site.
D. individual ants leading nest mates one by one to a new nest.

34. The passage suggests that which action of Scout A most strongly influences Scout B to follow Scout A to a new nest site?

F. Scout A tapping its head against the ground
G. Scout A dashing to and from the new site
H. Scout A releasing a pheromone
J. Scout A rejecting a poor site

35. In the passage, Pratt suggests that the dark side of the quorum system is that the remainder of the colony:

A. follows the quorum decision even when the quorum is wrong.
B. is often left behind in the old nest after a quorum decision.
C. sometimes challenges the quorum, leading to a split in the colony.
D. is in danger of not knowing how to reach the new nest.

36. As it is used in line 43, the word *newbie* most nearly refers to:

F. Scout A.
G. Scout B.
H. either Scout A or Scout B.
J. any ant at the original nest.

37. Based on the passage, if Scout B believes that a site Scout A found is acceptable, what does Scout B do next?

A. Returns to the original nest
B. Taps its antennae on Scout A
C. Begins building at the new site
D. Examines the area surrounding the new site

38. The passage states that the final decision to move a colony to a new site is made by rock ant scouts when:

F. the first scout to approve a new site brings a second ant to the site.
G. there are enough scouts at the site that they encounter each other at a sufficiently high rate.
H. at least half of the colony has already relocated to the new site.
J. two scouts set off tandem running to a new site and other ants follow.

39. The passage suggests that the shortest length of time in which rock ant scouts can move a colony to a new home is:

A. minutes.
B. hours.
C. days.
D. weeks.

40. Compared to their behavior when their current nest is disrupted by researchers, how does the behavior of rock ants differ when their current nest is left intact but they're offered a better nest?

F. They make a decision about where to move collectively as opposed to individually.
G. They're not as concerned with the accuracy of their decision to move.
H. They take more time deciding whether to move the colony to the new nest.
J. They split the colony between the current nest and the new nest instead of moving the entire colony.

END OF TEST 3

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

DO NOT RETURN TO A PREVIOUS TEST.

SCIENCE TEST
35 Minutes—40 Questions

DIRECTIONS: There are several passages in this test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

Fin whales engulf and filter massive amounts of water and prey during an event called *lunge feeding*. The 5 distinct stages of a lunge-feeding event are listed and described below.

- Stage 1: Rapid acceleration of the whale

- Stage 2: Mouth opening and engulfment

- Stage 3: Onset of mouth closure

- Stage 4: Continued mouth closure and pre-purging

- Stage 5: Purging (filtering water from prey)

The figure below shows how a fin whale's speed and *gape angle* (angle between the top and the bottom of the fin whale's mouth) varied during a lunge-feeding event.
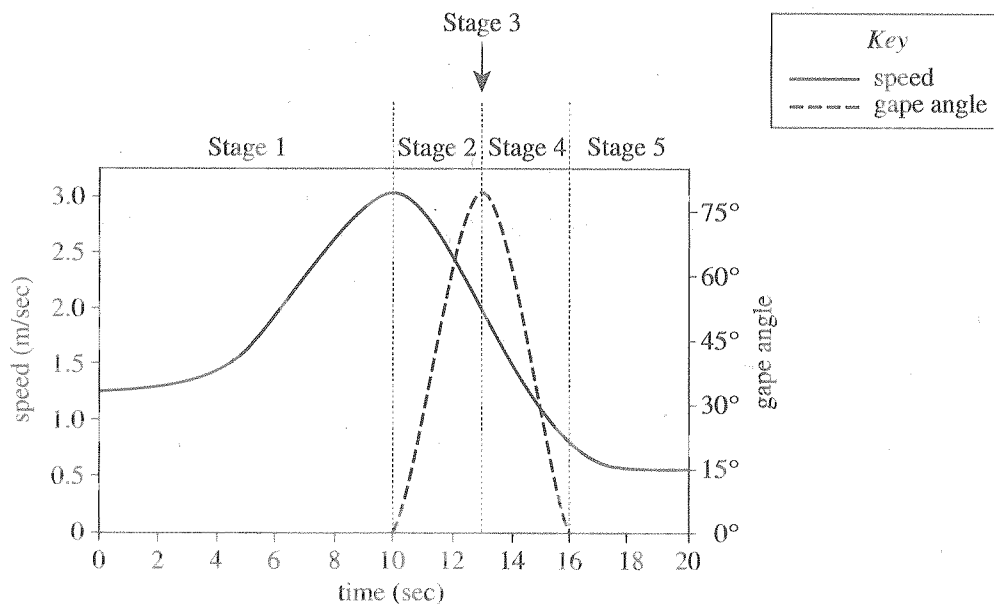

Figure adapted from J. Potvin et al., "Passive Versus Active Engulfment: Verdict from Trajectory Simulations of Lunge-Feeding Fin Whales *Balaenoptera physalus*." ©2009 by The Royal Society.

1. Over which of the following time periods of the lunge-feeding event did the gape angle both increase and decrease?

    A. 0–6 sec
    B. 8–12 sec
    C. 12–14 sec
    D. 14–18 sec

2. The figure indicates that at Stage 3 of the lunge-feeding event, the fin whale was:

    F. moving at its greatest speed and had just opened its mouth to begin engulfment.
    G. moving at its greatest speed and had just closed its mouth to begin purging.
    H. slowing down, and the whale's gape angle was at its greatest value.
    J. speeding up, and the whale's gape angle was at its smallest value.

3. What was the fin whale's gape angle 6 sec into the lunge-feeding event?

    A. 0°
    B. 15°
    C. 45°
    D. 75°

4. During the lunge-feeding event, how much time elapsed from the start of mouth opening to the end of mouth closure?

    F. 6 sec
    G. 10 sec
    H. 16 sec
    J. 20 sec

5. Among the following times during Stage 1 of the lunge-feeding event, at which time did the fin whale have the greatest amount of momentum?

    A. 2 sec
    B. 4 sec
    C. 6 sec
    D. 8 sec

6. Which of the following statements best explains why the speed of the fin whale decreased during Stage 2? During Stage 2, the cross-sectional area of the whale's mouth was:

    F. increasing, which caused the opposing drag force on the whale to decrease.
    G. increasing, which caused the opposing drag force on the whale to increase.
    H. decreasing, which caused the opposing drag force on the whale to decrease.
    J. decreasing, which caused the opposing drag force on the whale to increase.

Passage II

Figure 1 shows a model of an amusement park ride. At time = 0 sec, the cart is released from rest at Point P. It descends the tower toward Point Q and strikes the spring. As the spring is compressed, it slows the cart's descent and eventually rebounds, sending the cart back up the tower. Frictional forces act on the cart whenever it is in motion, and the spring never extends above Point Q. Figure 2 shows computer simulations of the cart's height (the distance from ground level to the bottom of the cart), its velocity, and its acceleration during the first 20 sec of motion.
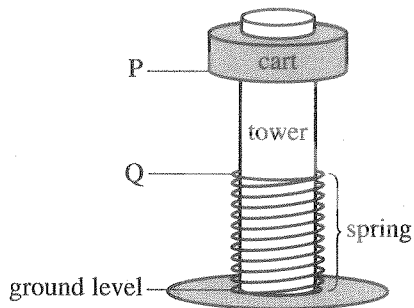
Note: Figure is not drawn to scale.

Figure 1
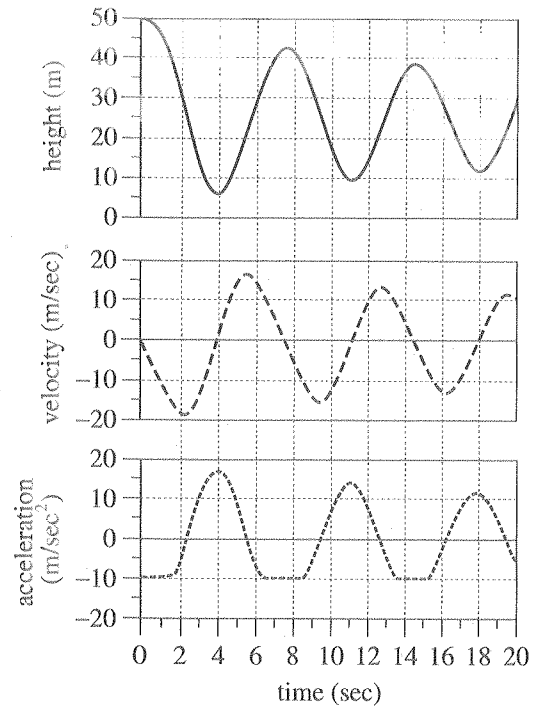
Note: Downward velocities and accelerations are graphed as negative values.

Figure 2
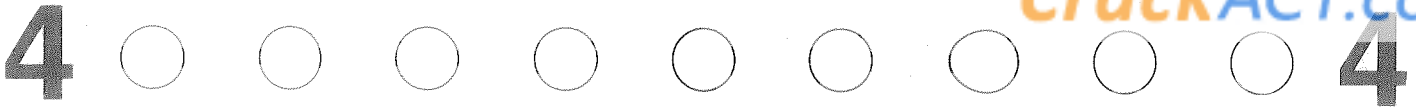
7. At approximately what time(s) during the 20 sec period, if any, does the cart touch the ground?

   A. 4 sec only
   B. 4 sec and 11 sec only
   C. 4 sec, 11 sec, and 18 sec only
   D. At no time does the cart touch the ground.

8. The cart's greatest upward acceleration has approximately what value and occurs at approximately what time?

	acceleration (m/sec^2)	time (sec)
F.	13	0
G.	13	4
H.	17	0
J.	17	4

9. The maximum height the cart reaches on its third trip up the tower is most likely:

   A. less than 20 m.
   B. between 20 m and 30 m.
   C. between 30 m and 40 m.
   D. greater than 40 m.

10. At time = 16 sec, what are the approximate values of the cart's height, velocity, and acceleration?

	height (m)	velocity (m/sec)	acceleration (m/sec^2)
F.	29	−11	−2.5
G.	29	−9	2.5
H.	31	−11	−2.5
J.	31	−9	2.5

11. At time = 7 sec, the bottom of the cart is approximately how far above or below Point P ?

    A. 10 m above
    B. 40 m above
    C. 10 m below
    D. 40 m below

12. The gravitational potential energy of the cart is greatest at approximately what time during the 20 sec period?

    F. 0 sec
    G. 4 sec
    H. 11 sec
    J. 14 sec

Passage III

Southern pine beetles (SPBs) construct nursery galleries for their larvae within the bark of pine trees. SPBs introduce Fungus M into the nursery gallery to serve as a food source for developing SPB larvae. If a competitor fungus—Fungus A—outcompetes Fungus M in the gallery, SPB larval development will be disrupted.

SPBs also introduce into the nursery gallery a bacterial species that is thought to help maintain the relationship between SPBs and Fungus M. Two strains of this bacterial species, Strain W and Strain R, have been isolated from SPBs. Scientists did 2 experiments to study whether the introduction of Strain W or Strain R would be more likely to protect the larval food supply.

Experiment 1

An agar growth medium contained in each of 160 petri dishes was inoculated at its center with Strain W. The medium in each dish was also inoculated, at a point near its edge, with a fungal species: in 80 dishes with Fungus M and in the other 80 dishes with Fungus A. At the end of 6 weeks, the shortest distance across the *zone of inhibition* (ZOI; the space between the edges of fungal growth and of bacterial growth) was measured for each dish. The shortest distance for a dish, defined here as the width of the ZOI, determined the *degree of inhibition* exhibited by the dish (see Table 1).

Table 1	
Width of ZOI (cm)	Degree of inhibition
< 0.5 0.5–2.5 > 2.5	little or none mild strong

Figure 1 shows, for each fungus, what percent of the 80 dishes exhibited a given degree of inhibition.
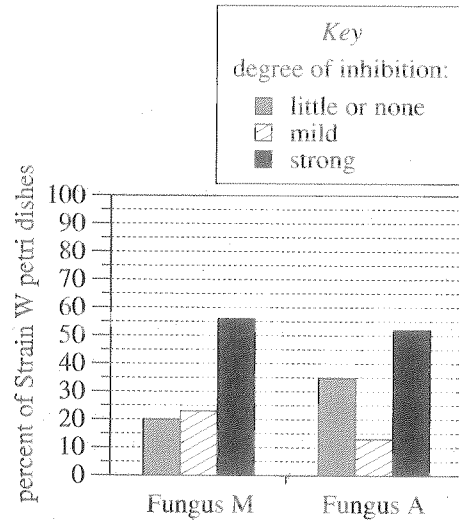

Figure 1

Experiment 2

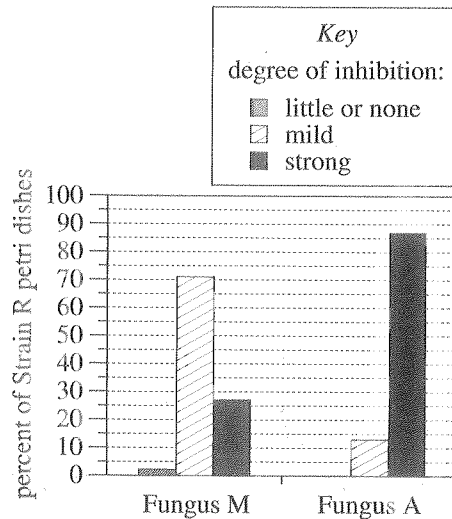Experiment 1 was repeated, except with Strain R instead of Strain W (see Figure 2).
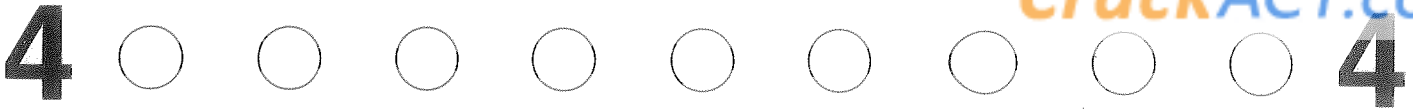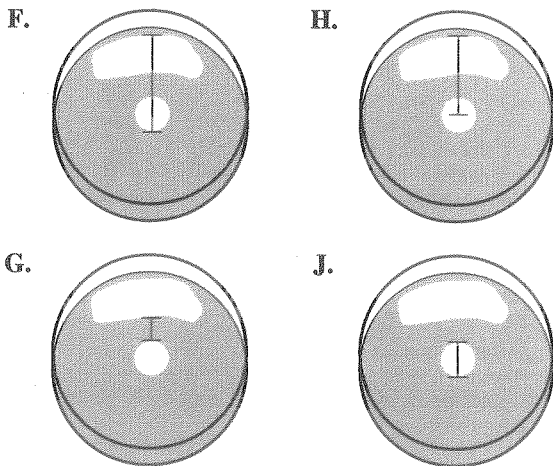

Figure 2

Table and figures adapted from Jarrod J. Scott et al., "Bacterial Protection of Beetle-Fungus Mutualism." ©2008 by American Association for the Advancement of Science.

13. Which of the following statements describes a difference between Experiments 1 and 2 ?

   A. A different bacterial strain was tested in Experiment 1 than was tested in Experiment 2.
   B. A different fungal species was tested in Experiment 1 than was tested in Experiment 2.
   C. SPB larvae were observed in Experiment 1 but not in Experiment 2.
   D. SPB larvae were observed in Experiment 2 but not in Experiment 1.

14. The type of agar growth medium used in Experiments 1 and 2 was most likely chosen for which of the following reasons?

   F. Only bacteria grow on this type of medium.
   G. Only fungi grow on this type of medium.
   H. Both bacteria and fungi grow on this type of medium.
   J. Neither bacteria nor fungi grow on this type of medium.

15. Consider the petri dishes containing Strain R and Fungus M. What percent of those dishes exhibited a mild degree of inhibition?

   A. 2%
   B. 13%
   C. 23%
   D. 71%

16. The width of a ZOI is best depicted by which of the following figures?

Key
○ bacterial or fungal cells

17. The width of the ZOI for more than half of the petri dishes containing Strain W and Fungus M was within what range?

   A. < 0.5 cm
   B. 0.5 cm–2.5 cm
   C. > 2.5 cm
   D. Cannot be determined from the given information

18. Based on the results of Experiment 2, the introduction of Strain R into a nursery gallery by SPBs would more likely strongly inhibit the growth of which fungus, Fungus M or Fungus A ?

   F. Fungus M, because approximately 27% of the petri dishes containing Strain R and Fungus M exhibited a strong degree of inhibition.
   G. Fungus M, because approximately 71% of the petri dishes containing Strain R and Fungus M exhibited a strong degree of inhibition.
   H. Fungus A, because approximately 52% of the petri dishes containing Strain R and Fungus A exhibited a strong degree of inhibition.
   J. Fungus A, because approximately 87% of the petri dishes containing Strain R and Fungus A exhibited a strong degree of inhibition.

19. Which of the following figures best depicts each of 80 of the petri dishes in Experiment 1 immediately following inoculation?
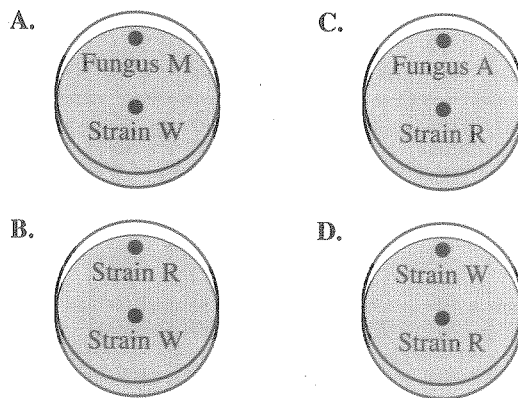
Passage IV

A *transformer* is an electrical component used to increase or decrease voltage. In 3 experiments, a group of students studied transformers using the setup shown in Figure 1.

Figure 1

An input coil was wrapped N_{in} turns around one side of a *core* (a solid ring) and then connected to an *ammeter* (current-measuring device) and a pow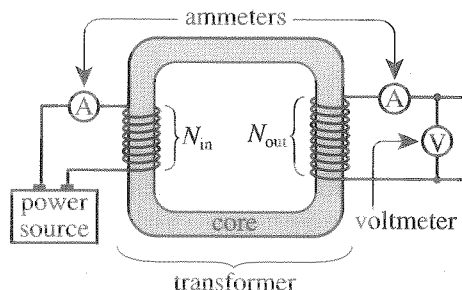er source. An output coil was wrapped N_{out} turns around the opposite side of the core and then connected to an ammeter and a voltmeter. $\mathscr{E}_{in}$ and $\mathscr{E}_{out}$ were the input and output voltages (in volts, V), respectively. I_{in} and I_{out} were the input and output currents (in milliamperes, mA), respectively.

Experiment 1

In Trials 1–12, the core was made of iron, and the power source was a generator of *alternating current* (AC; current that varies over time). The students measured I_{in}, $\mathscr{E}_{out}$, and I_{out} for various combinations of N_{in}, N_{out}, and $\mathscr{E}_{in}$ (see Table 1).

			Table 1			
Trial	N_{in}	N_{out}	$\mathscr{E}_{in}$ (V)	I_{in} (mA)	$\mathscr{E}_{out}$ (V)	I_{out} (mA)
1	100	50	30	100	15	200
2	150	50	30	100	10	300
3	200	50	30	100	8	400
4	250	50	30	100	6	500
5	50	100	30	100	60	50
6	50	150	30	100	90	33
7	50	200	30	100	120	25
8	50	250	30	100	150	20
9	50	100	60	200	120	100
10	50	100	90	300	180	150
11	50	100	120	400	240	200
12	50	100	150	500	300	250

Experiment 2

In Trials 13–17, the procedure followed in Trial 5 was repeated except that the core material was varied (see Table 2).

		Table 2		
Trial	Core material	I_{in} (mA)	$\mathscr{E}_{out}$ (V)	I_{out} (mA)
13	aluminum	100	0	0
14	cobalt	100	61	49
15	glass	100	0	0
16	nickel	100	59	50
17	vinyl	100	0	0

Experiment 3

The procedures followed in Trials 1–12 were repeated, except that the power source was a battery supplying *direct current* (DC; current that remains constant over time). The I_{in} results matched those of Experiment 1, but in every trial, $\mathscr{E}_{out}$ was 0 V and I_{out} was 0 mA.

20. One of the students concluded that as $\mathscr{E}_{in}$ increases, I_{in} also increases. The student most likely arrived at this conclusion based on the results of which of the following groups of trials?

F. Trials 1–4
G. Trials 5–8
H. Trials 9–12
J. Trials 13–17

21. If N_{in} had been 300 turns in Trial 4, $\mathscr{E}_{out}$ would most likely have been:

A. less than 6 V.
B. between 6 V and 8 V.
C. between 8 V and 10 V.
D. greater than 10 V.

22. Consider the figure below, which shows values of $\mathscr{E}_{out}$ and I_{out} for Trials K, L, M, and N.

Key
■ $\mathscr{E}_{out}$
▨ I_{out}
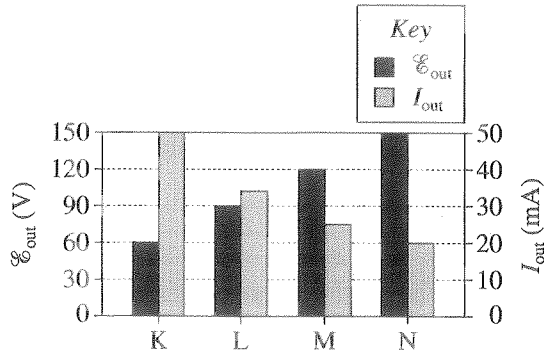
Based on the results of Experiments 1 and 2, Trials K, L, M, and N correspond to, respectively:

F. Trials 1, 2, 3, and 4.
G. Trials 5, 6, 7, and 8.
H. Trials 9, 10, 11, and 12.
J. Trials 13, 14, 15, and 16.

23. Suppose that a trial were performed in which $N_{in} = 50$ turns, $N_{out} = 300$ turns, and $\mathscr{E}_{in} = 30$ V AC. If the core were made of iron, which of the following combinations of I_{in}, $\mathscr{E}_{out}$, and I_{out} would most likely result from this trial?

	I_{in} (mA)	$\mathscr{E}_{out}$ (V)	I_{out} (mA)
A.	100	10	300
B.	100	180	17
C.	200	10	250
D.	200	180	7

24. For a transformer like those tested in Experiments 1–3 to generate an output voltage, a phenomenon called *induction* must occur in the core. Based on the results of Experiments 1 and 3, induction occurred only in the trials with:

F. an AC power source, because the transformers tested in Experiment 1 generated an output voltage, but those tested in Experiment 3 did not.
G. an AC power source, because the transformers tested in Experiment 3 generated an output voltage, but those tested in Experiment 1 did not.
H. a DC power source, because the transformers tested in Experiment 1 generated an output voltage, but those tested in Experiment 3 did not.
J. a DC power source, because the transformers tested in Experiment 3 generated an output voltage, but those tested in Experiment 1 did not.

25. In Experiments 1–3, there was *no* trial performed with a:

A. metal core and an AC power supply.
B. metal core and a DC power supply.
C. nonmetal core and an AC power supply.
D. nonmetal core and a DC power supply.

26. In Trials 13–17, the values of N_{in}, N_{out}, and $\mathscr{E}_{in}$ were, respectively:

F. 50 turns, 100 turns, and 30 V.
G. 50 turns, 100 turns, and 60 V.
H. 100 turns, 50 turns, and 30 V.
J. 100 turns, 50 turns, and 60 V.

Passage V

Two scientists discuss whether a *snowball Earth* (Earth completely covered with glacial ice) existed from 710 million years ago (mya) to 700 mya, a period during which all the continents were located on or near the equator.

Scientist 1

A million years before 710 mya, glacial ice covered all of Earth's surface except the *low latitudes* (30°N to 30°S). Over the next million years, continuing rapid rock weathering in the low latitudes removed CO_2 from the atmosphere, and the ice at high latitudes reflected incoming solar radiation. Both processes cooled Earth, which allowed the ice to spread and cover the remainder of Earth's surface by 710 mya. Soon thereafter, the 1-kilometer-thick ice cover caused the extinction of all photosynthetic organisms. Sediments deposited at the low latitudes by glaciers during the period from 710 mya to 700 mya have been found.

Banded iron formations (BIFs) that formed in the 1 million years after 700 mya at the low latitudes have been found. The BIFs formed only in ocean water that was saturated with Fe^{2+}, an ion of iron that reacts readily with atmospheric O_2. Saturation with Fe^{2+} was possible only if an ocean had been cut off from atmospheric O_2 for millions of years by thick ice. Once the ice melted, the Fe^{2+} reacted with O_2 to form BIFs.

Scientist 2

From 710 mya to 700 mya, glacial ice covered all of Earth's surface except the low latitudes. The low latitudes remained mostly ice-free over this period because the continents there absorbed enough solar radiation to keep the average temperature above 0°C. Although rapid rock weathering was removing CO_2 from the atmosphere, widespread, continual volcanic eruptions at low latitudes simultaneously added an equal amount of CO_2 to the atmosphere.

Fossils of photosynthetic organisms from this period have been found. Some of the sediments from this period were deposited at low latitudes when floating icebergs that broke off of glaciers at high latitudes melted and dropped sediment that had been trapped in the ice. BIFs did form as described by Scientist 1, but only in the few isolated ocean basins at low latitudes that had been completely covered with thick ice over this period.

27. BIFs are composed primarily of the mineral *hematite* (Fe_2O_3). Based on Scientist 1's discussion of the formation of BIFs, which of the following expressions best represents the formation of the hematite in BIFs ?

   A. oxygen → iron ion + hematite
   B. hematite + iron ion → oxygen
   C. iron ion → hematite + oxygen
   D. iron ion + oxygen → hematite

28. Which of the following processes is discussed by Scientist 2 but not by Scientist 1 ?

   F. The removal of CO_2 from the atmosphere by rock weathering
   G. The addition of CO_2 to the atmosphere by volcanoes
   H. The extinction of photosynthetic organisms
   J. The formation of BIFs

29. Assume that from 710 mya to 700 mya, rock weathering was the only process removing CO_2 from the atmosphere and volcanic eruption was the only process adding CO_2 to the atmosphere. Based on Scientist 2's discussion, which of the following graphs best represents the CO_2 concentration in the atmosphere over this period?
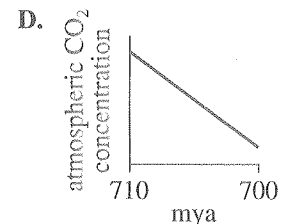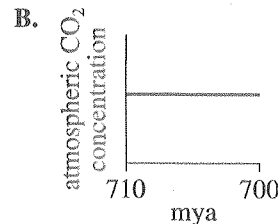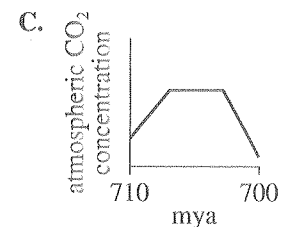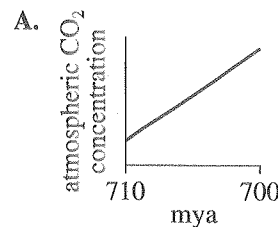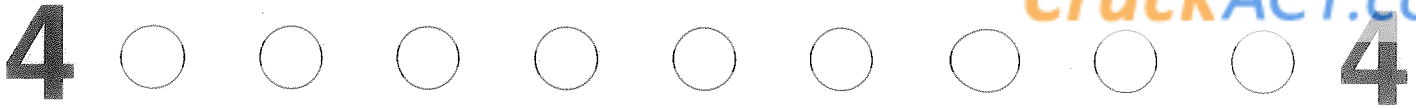
30. Fossils of the photosynthetic organisms mentioned by Scientist 2 would most likely have been found from 710 mya to 700 mya in areas at which of the following latitudes?

F. 60°N
G. 40°N
H. 20°S
J. 50°S

31. Suppose it were discovered that air temperatures everywhere on Earth were continuously at or below −10°C from 710 mya to 700 mya. This discovery would more strongly support the viewpoint of which scientist?

A. Scientist 1, because that temperature is well above the maximum temperature at which glacial ice can form.
B. Scientist 1, because that temperature is well below the maximum temperature at which glacial ice can form.
C. Scientist 2, because that temperature is well above the maximum temperature at which glacial ice can form.
D. Scientist 2, because that temperature is well below the maximum temperature at which glacial ice can form.

32. Suppose it were discovered that no O_2 had been present in Earth's atmosphere from 700 mya to 690 mya. Would the viewpoint of Scientist 1 be strengthened or weakened by this discovery?

F. Strengthened, because it would indicate that BIFs would have formed at low latitudes during that period.
G. Strengthened, because it would indicate that BIFs would not have formed at low latitudes during that period.
H. Weakened, because it would indicate that BIFs would have formed at low latitudes during that period.
J. Weakened, because it would indicate that BIFs would not have formed at low latitudes during that period.

33. Suppose it were discovered that most of Earth's surface between 30°N and 60°N latitude was ice-free 705 mya. This discovery would *contradict* one or more statements made by which of the scientists, if either?

A. Scientist 1 only
B. Scientist 2 only
C. Both scientists
D. Neither scientist

Passage VI

The *ideal gas law* (IGL) describes the physical behavior of gases. Although ideal gases do not exist, the IGL is a useful model for many real gases. A researcher used the IGL to predict trends in the pressure of an ideal gas under various sets of conditions. Then, the researcher performed 3 experiments to compare the IGL predictions with trends in the pressure of each of 2 real gases (Gas Y and Gas Z) under the same sets of conditions. The conditions that were varied for an ideal gas, for Gas Y, and for Gas Z were the following:

- The gas temperature, T (in kelvins, K)

- The amount of gas, n (in *moles*, mol; 1 mol = 6.0×10^{23} atoms or molecules), in a container

- The volume of the container, V (in liters, L)

Experiment 1

The pressure, P (in megapascals, MPa), of an $n = 1$ mol sample of Gas Y in a 1.0 L container was recorded for values of T from 200 K to 450 K. This procedure was repeated for Gas Z. Figure 1 shows the trends for the 2 gases. Also shown is the trend predicted by the IGL.
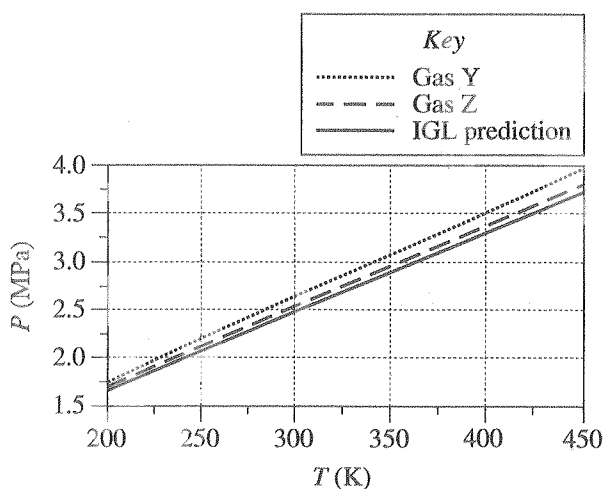
Figure 1

Experiment 2

The pressure, P, of a sample of Gas Y in a 1.0 L container was recorded for values of n from 1 mol to 10 mol, while T was held constant at 400 K. This procedure was repeated for Gas Z. Figure 2 shows the trends for the 2 gases and the trend predicted by the IGL.
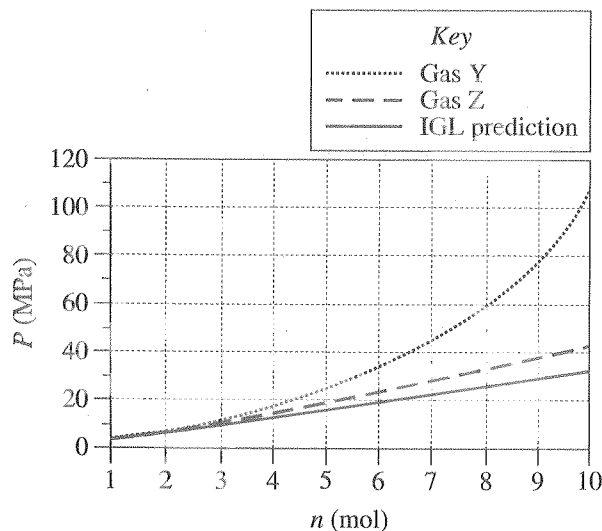
Figure 2

Experiment 3

The pressure, P, of an $n = 1$ mol sample of Gas Y in a container of adjustable volume was recorded for values of V from 0.5 L to 1.0 L, while T was held constant at 400 K. This procedure was repeated for Gas Z. Figure 3 shows the trends for the 2 gases and the trend predicted by the IGL.
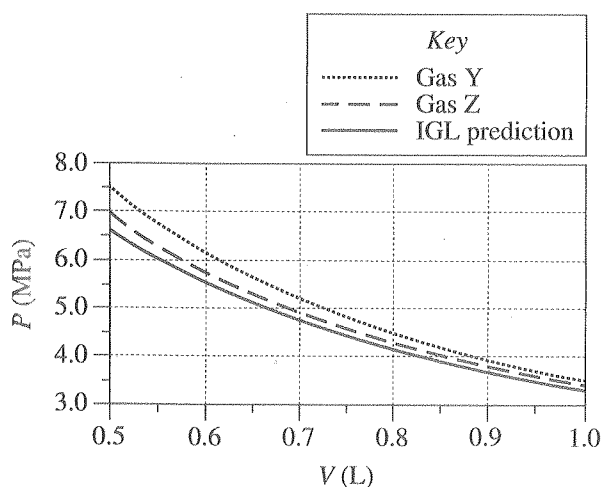
Figure 3
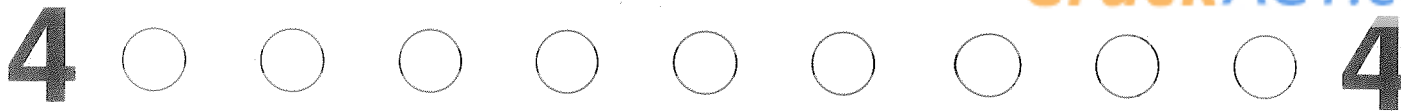
34. In which experiments was *T* held constant?

    F. Experiments 1 and 2 only
    G. Experiments 1 and 3 only
    H. Experiments 2 and 3 only
    J. Experiments 1, 2, and 3

35. The purpose of Experiment 2 was most likely to determine the relationship between:

    A. *P* and *T* while holding *n* and *V* constant.
    B. *P* and *n* while holding *T* and *V* constant.
    C. *n* and *T* while holding *V* and *P* constant.
    D. *n* and *V* while holding *P* and *T* constant.

36. Based on the results of Experiments 1–3, which gas exhibited behaviors more like those that were predicted by the IGL?

    F. Gas Y, because values of *P* for Gas Y deviated more from the IGL predictions than did values of *P* for Gas Z.
    G. Gas Y, because values of *P* for Gas Y deviated less from the IGL predictions than did values of *P* for Gas Z.
    H. Gas Z, because values of *P* for Gas Z deviated more from the IGL predictions than did values of *P* for Gas Y.
    J. Gas Z, because values of *P* for Gas Z deviated less from the IGL predictions than did values of *P* for Gas Y.

37. In Experiment 1, was the average kinetic energy of Gas Y molecules more likely greater at *P* = 2.0 MPa or at *P* = 4.0 MPa ?

    A. At *P* = 2.0 MPa, because at that lower pressure, the gas molecules had less room in which to move.
    B. At *P* = 2.0 MPa, because the average kinetic energy of a gas increases as *T* decreases.
    C. At *P* = 4.0 MPa, because at that higher pressure, the gas molecules had more room in which to move.
    D. At *P* = 4.0 MPa, because the average kinetic energy of a gas increases as *T* increases.

38. The containers used in Experiments 1–3 could withstand the same maximum pressure. Based on the results of the experiments, that maximum pressure must have been closest to which of the following?

    F. 4.0 MPa
    G. 7.5 MPa
    H. 45 MPa
    J. 100 MPa

39. One mole of Gas Y has a mass of 20 g. In Experiment 2, what was the mass of the Gas Y sample when the pressure of the sample was 25 MPa ?

    A. 4 g
    B. 5 g
    C. 100 g
    D. 125 g

40. Consider an *n* = 1 mol sample of Gas Z at 400 K in a 1.0 L container of adjustable volume. Suppose the researcher must decrease the container's volume, but wishes to hold *P* constant. Based on the results of Experiments 1–3, which of the following additional actions should the researcher perform simultaneously as *V* is decreased?

    F. Decrease *T* while holding *n* constant
    G. Increase *T* while holding *n* constant
    H. Hold both *T* and *n* constant
    J. Increase both *T* and *n*

END OF TEST 4

STOP! DO NOT RETURN TO ANY OTHER TEST.

Explanation of Procedures Used to Obtain Scale Scores from Raw Scores

On each of the four tests on which you marked any responses, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale scores. For each test, locate and circle your raw score or the range of raw scores that includes it in the table below. Then, read across to either outside column of the table and circle the scale score that corresponds to that raw score. As you determine your scale scores, enter them in the blanks provided on the right. The highest possible scale score for each test is 36. The lowest possible scale score for any test on which you marked any responses is 1.

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scale scores and divide the sum 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.) Enter this number in the blank. This is your Composite score. The highest possible Composite score is 36. The lowest possible Composite score is 1.

ACT Test 72F	Your Scale Score
English	_____
Mathematics	_____
Reading	_____
Science	_____
Sum of scores	_____
Composite score (sum ÷ 4)	_____

NOTE: If you left a test completely blank and marked no items, do not list a scale score for that test. If any test was completely blank, do not calculate a Composite score.

Scale Score	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science	Scale Score
			Raw Scores		
36	74-75	60	40	40	36
35	71-73	58-59	—	—	35
34	70	57	39	39	34
33	68-69	56	38	38	33
32	67	54-55	37	—	32
31	66	53	36	37	31
30	64-65	51-52	34-35	36	30
29	63	50	33	35	29
28	61-62	47-49	32	34	28
27	60	44-46	31	33	27
26	58-59	41-43	30	31-32	26
25	56-57	39-40	29	30	25
24	54-55	36-38	28	28-29	24
23	51-53	34-35	26-27	26-27	23
22	49-50	32-33	24-25	24-25	22
21	46-48	31	23	22-23	21
20	43-45	29-30	21-22	20-21	20
19	41-42	27-28	20	18-19	19
18	39-40	24-26	18-19	16-17	18
17	37-38	21-23	17	15	17
16	35-36	16-20	15-16	13-14	16
15	31-34	13-15	14	12	15
14	29-30	10-12	12-13	11	14
13	27-28	8-9	10-11	9-10	13
12	25-26	7	8-9	8	12
11	22-24	5-6	7	7	11
10	20-21	4	6	6	10
9	17-19	—	5	5	9
8	15-16	3	4	4	8
7	12-14	—	—	3	7
6	10-11	2	3	—	6
5	7-9	—	2	2	5
4	6	1	—	—	4
3	4-5	—	1	1	3
2	2-3	—	—	—	2
1	0-1	0	0	0	1

Explanation of Procedures Used to Obtain Scale Subscores from Raw Scores

For each of the seven subscore areas, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale subscores. For each of the seven subscore areas, locate and circle either the raw score or the range of raw scores that includes it in the table below. Then, read across to either outside column of the table and circle the scale subscore that corresponds to that raw score. As you determine your scale subscores, enter them in the blanks provided on the right. The highest possible scale subscore is 18. The lowest possible scale subscore is 1.

If you left a test completely blank and marked no items, do not list any scale subscores for that test.

ACT Test 72F — Your Scale Subscore

English
- Usage/Mechanics _____
- Rhetorical Skills _____

Mathematics
- Pre-Algebra/Elementary Algebra _____
- Intermed. Algebra/Coord. Geometry _____
- Plane Geometry/Trigonometry _____

Reading
- Social Studies/Sciences _____
- Arts/Literature _____

Raw Scores

Scale Subscore	Test 1 English		Test 2 Mathematics			Test 3 Reading		Scale Subscore
	Usage/Mechanics	Rhetorical Skills	Pre-Algebra/Elem. Algebra	Inter. Algebra/Coord. Geometry	Plane Geometry/Trigonometry	Social Studies/Sciences	Arts/Literature	
18	38-40	35	23-28	18-20	18	20	20	18
17	35-37	33-34	22	17	—	18-19	—	17
16	34	32	21	—	16-17	17	19	16
15	33	29-31	20	15-16	14-15	16	18	15
14	31-32	28	18-19	13-14	13	14-15	17	14
13	30	26-27	17	11-12	11-12	13	16	13
12	28-29	24-25	15-16	10	10	12	14-15	12
11	26-27	22-23	14	9	8-9	11	13	11
10	23-25	20-21	13	7-8	7	9-10	12	10
9	21-22	17-19	11-12	6	6	8	10-11	9
8	19-20	15-16	9-10	4-5	4-5	7	9	8
7	17-18	13-14	6-8	3	—	5-6	8	7
6	14-16	12	5	—	3	4	6-7	6
5	12-13	10-11	3-4	2	2	3	4-5	5
4	10-11	7-9	2	—	—	2	3	4
3	8-9	5-6	—	1	1	—	2	3
2	5-7	3-4	1	—	—	1	1	2
1	0-4	0-2	0	0	0	0	0	1

07/15/16

ACT ASSESSMENT TEST INFORMATION RELEASE REPORT
TEST DATE = 06/16   TEST FORM = 72F   TEST CENTER = 16422

xxxxx1446
012199

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                    1 1111111112 2222222223 3333333334 4444444445 5555555556 6666666667 77777
ITEM NUMBER         1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12345

ENGLISH
CORRECT ANSWER      BHBJAFAGAG BHCFDJAGAF BGAHDHBHBF DHBFBHCHAF BHBFDJCFBJ DGDFDGCHDH DFAHAJDGDH DJAGC
YOUR ANSWER         ++++++++++ ++++++++++ +++++++++J ++CJ+FA+++ ++++++++++ A+A+BF++++ ++++++++++ +F+++
SUBSCORE            RURURRUUU  RURRRRUUU  UUURRRUUU  URURURRRUR RURURURUR  RUUURUURR  URURUUURUR URURR

MATHEMATICS
CORRECT ANSWER      EJCJBKBFEF CFCHCGAHAH EJDGBFCFEJ CKBKCGDJCJ AKBKAFEFAG DJDGDFEGDG
YOUR ANSWER         ++++D+++++ ++++++++++ +++++++++J +++++++K++ +++++++H+G ++++EJ+++H
SUBSCORE            AAAATAAAG  GTAGAGGTAA ATGTGAGAAT TATTTTTGGG AAAAGTAAGT GGTGGTGTAT

READING
CORRECT ANSWER      CJDFDHBJDF AFDFCHBGCG CHDFBHCJAF DJCHAGAGBH
YOUR ANSWER         +G+GBF++CG +H++++++++ ++++++++++G +++++++DH+F
SUBSCORE            LLLLLLLLL  SSSSSSSSS  LLLLLLLLL  SSSSSSSSS

SCIENCE
CORRECT ANSWER      CHAFDGDJCF CFAHDGCJAH AGBFDFDGBH BJCHBJDJCF
YOUR ANSWER         ++++++++++ +++++++++  +++++H++C+ D+++++++++
```

1st Row: Correct responses to the items on the ACT tests.

2nd Row: Your Responses:
   A plus (+) indicates your response was correct.
   A letter (A through K) is the response you chose,
     if your answer was incorrect.
   A dash (-) indicates you omitted the item.
   An asterisk (*) indicates you gridded more than
     one response.

3rd Row: If the test includes subscores, one of the letters below
   indicates the category to which each item belongs:

English: U = Usage/Mechanics
         R = Rhetorical Skills
Math: A = Pre-Algebra/Elementary Algebra
         G = Intermediate Algebra/Coordinate Geometry
         T = Plane Geometry/Trigonometry
Reading: S = Social Studies/Sciences
         L = Arts/Language

0000174

WITH WRITING TEST FORM: 23F

	1st RATER:	2nd RATER:
IDEAS AND ANALYSIS:	05	04
DEVELOPMENT AND SUPPORT:	05	04
ORGANIZATION:	05	04
LANGUAGE USE AND CONVENTIONS:	05	05

Form 23F
ACT® Writing Test Prompt
(June 2016)

Latest and Greatest

In the past, people who made major purchases expected their new item to last. These days, however, the trend seems to have reversed. Clothing, mobile devices, automobiles—many consumer goods are regularly updated, upgraded, or redesigned, and people rush to purchase the newest models, whether or not they represent clear improvements over the old. It is worth considering what such a strong emphasis on "newness" might indicate about our contemporary cultural values.

Read and carefully consider these perspectives. Each suggests a particular way of thinking about what our preference for new things indicates about our cultural values.

Perspective One	Perspective Two	Perspective Three
As a culture, we value innovation. We encourage and support new and improved products because they make our personal lives better and keep our society from stagnating.	Our great desire for the "latest and greatest" represents a dangerous cultural mindset: everything is disposable; little is cherished or made to last.	"Newness" is no new concern. Every generation has wanted new things; technological advancements and product redesigns just happen much faster these days.

Essay Task

Write a unified, coherent essay in which you evaluate multiple perspectives on what our preference for new things indicates about our cultural values. In your essay, be sure to:

- analyze and evaluate the perspectives given
- state and develop your own perspective on the issue
- explain the relationship between your perspective and those given

Your perspective may be in full agreement with any of the others, in partial agreement, or wholly different. Whatever the case, support your ideas with logical reasoning and detailed, persuasive examples.

Writing Test Scores Overview

Two trained readers scored your essay on a scale of 1–6 in each of the four writing domains: Ideas and Analysis, Development and Support, Organization, and Language Use and Conventions. The ACT Writing Test Scoring Rubric provided below presents the standards by which your essay was evaluated.

Each domain score represents the sum of the two readers' scores. Your writing score is calculated from your domain scores and is reported on a scale of 1–36. Your domain scores do not necessarily add up to your reported writing score.

Because each domain receives its own score, the four scores will not necessarily be identical. For example, you may find that your essay exhibited stronger skill in organization than in the development of ideas.

The ACT Writing Test Scoring Rubric

	Ideas and Analysis	Development and Support	Organization	Language Use
Score 6: **Responses at this scorepoint demonstrate effective skill in writing an argumentative essay.**	The writer generates an argument that critically engages with multiple perspectives on the given issue. The argument's thesis reflects nuance and precision in thought and purpose. The argument establishes and employs an insightful context for analysis of the issue and its perspectives. The analysis examines implications, complexities and tensions, and/or underlying values and assumptions.	Development of ideas and support for claims deepen insight and broaden context. An integrated line of skillful reasoning and illustration effectively conveys the significance of the argument. Qualifications and complications enrich and bolster ideas and analysis.	The response exhibits a skillful organizational strategy. The response is unified by a controlling idea or purpose, and a logical progression of ideas increases the effectiveness of the writer's argument. Transitions between and within paragraphs strengthen the relationships among ideas.	The use of language enhances the argument. Word choice is skillful and precise. Sentence structures are consistently varied and clear. Stylistic and register choices, including voice and tone, are strategic and effective. While a few minor errors in grammar, usage, and mechanics may be present, they do not impede understanding.
Score 5: **Responses at this scorepoint demonstrate well-developed skill in writing an argumentative essay.**	The writer generates an argument that productively engages with multiple perspectives on the given issue. The argument's thesis reflects precision in thought and purpose. The argument establishes and employs a thoughtful context for analysis of the issue and its perspectives. The analysis addresses implications, complexities and tensions, and/or underlying values and assumptions.	Development of ideas and support for claims deepen understanding. A mostly integrated line of purposeful reasoning and illustration capably conveys the significance of the argument. Qualifications and complications enrich ideas and analysis.	The response exhibits a productive organizational strategy. The response is mostly unified by a controlling idea or purpose, and a logical sequencing of ideas contributes to the effectiveness of the argument. Transitions between and within paragraphs consistently clarify the relationships among ideas.	The use of language works in service of the argument. Word choice is precise. Sentence structures are clear and varied often. Stylistic and register choices, including voice and tone, are purposeful and productive. While minor errors in grammar, usage, and mechanics may be present, they do not impede understanding.
Score 4: **Responses at this scorepoint demonstrate adequate skill in writing an argumentative essay.**	The writer generates an argument that engages with multiple perspectives on the given issue. The argument's thesis reflects clarity in thought and purpose. The argument establishes and employs a relevant context for analysis of the issue and its perspectives. The analysis recognizes implications, complexities and tensions, and/or underlying values and assumptions.	Development of ideas and support for claims clarify meaning and purpose. Lines of clear reasoning and illustration adequately convey the significance of the argument. Qualifications and complications extend ideas and analysis.	The response exhibits a clear organizational strategy. The overall shape of the response reflects an emergent controlling idea or purpose. Ideas are logically grouped and sequenced. Transitions between and within paragraphs clarify the relationships among ideas.	The use of language conveys the argument with clarity. Word choice is adequate and sometimes precise. Sentence structures are clear and demonstrate some variety. Stylistic and register choices, including voice and tone, are appropriate for the rhetorical purpose. While errors in grammar, usage, and mechanics are present, they rarely impede understanding.

	Ideas and Analysis	Development and Support	Organization	Language Use
Score 3: **Responses at this scorepoint demonstrate some developing skill in writing an argumentative essay.**	The writer generates an argument that responds to multiple perspectives on the given issue. The argument's thesis reflects some clarity in thought and purpose. The argument establishes a limited or tangential context for analysis of the issue and its perspectives. Analysis is simplistic or somewhat unclear.	Development of ideas and support for claims are mostly relevant but are overly general or simplistic. Reasoning and illustration largely clarify the argument but may be somewhat repetitive or imprecise.	The response exhibits a basic organizational structure. The response largely coheres, with most ideas logically grouped. Transitions between and within paragraphs sometimes clarify the relationships among ideas.	The use of language is basic and only somewhat clear. Word choice is general and occasionally imprecise. Sentence structures are usually clear but show little variety. Stylistic and register choices, including voice and tone, are not always appropriate for the rhetorical purpose. Distracting errors in grammar, usage, and mechanics may be present, but they generally do not impede understanding.
Score 2: **Responses at this scorepoint demonstrate weak or inconsistent skill in writing an argumentative essay.**	The writer generates an argument that weakly responds to multiple perspectives on the given issue. The argument's thesis, if evident, reflects little clarity in thought and purpose. Attempts at analysis are incomplete, largely irrelevant, or consist primarily of restatement of the issue and its perspectives.	Development of ideas and support for claims are weak, confused, or disjointed. Reasoning and illustration are inadequate, illogical, or circular, and fail to fully clarify the argument.	The response exhibits a rudimentary organizational structure. Grouping of ideas is inconsistent and often unclear. Transitions between and within paragraphs are misleading or poorly formed.	The use of language is inconsistent and often unclear. Word choice is rudimentary and frequently imprecise. Sentence structures are sometimes unclear. Stylistic and register choices, including voice and tone, are inconsistent and are not always appropriate for the rhetorical purpose. Distracting errors in grammar, usage, and mechanics are present, and they sometimes impede understanding.
Score 1: **Responses at this scorepoint demonstrate little or no skill in writing an argumentative essay.**	The writer fails to generate an argument that responds intelligibly to the task. The writer's intentions are difficult to discern. Attempts at analysis are unclear or irrelevant.	Ideas lack development, and claims lack support. Reasoning and illustration are unclear, incoherent, or largely absent.	The response does not exhibit an organizational structure. There is little grouping of ideas. When present, transitional devices fail to connect ideas.	The use of language fails to demonstrate skill in responding to the task. Word choice is imprecise and often difficult to comprehend. Sentence structures are often unclear. Stylistic and register choices are difficult to identify. Errors in grammar, usage, and mechanics are pervasive and often impede understanding.

How Your Writing Score Was Calculated

1. Locate the 1st Rater and 2nd Rater scores (1–6) on the enclosed Test Information Release report and enter them in the first two columns below. Add the Rater scores and enter in the Domain Score column to the right.

	1st Rater		2nd Rater		Domain Score
Ideas and Analysis	_____	+	_____	=	_____
Development and Support	_____	+	_____	=	_____
Organization	_____	+	_____	=	_____
Language Use and Conventions	_____	+	_____	=	_____

2. Enter the sum of the Domain Scores here _____. This is your raw score (value between 8 and 48).

3. Use the table below to find the scaled Writing Subject Score that corresponds to your raw score.

Scale Score	Raw Score Writing
36	48
35	47
34	46
33	45
32	44
31	42-43
30	41
29	40
28	38-39
27	37
26	36
25	34-35
24	33
23	32
22	—
21	30-31
20	29
19	28
18	26-27
17	25
16	24
15	23
14	22
13	21
12	20
11	19
10	18
9	16-17
8	15
7	14
6	13
5	12
4	11
3	10
2	9
1	8