



# Practice Test Booklet

Form 0961F

## Directions

This booklet contains tests in English, Mathematics, Reading, and Science. These tests measure skills and abilities highly related to high school course work and success in college. **CALCULATORS MAY BE USED ON THE MATHEMATICS TEST ONLY.**

The questions in each test are numbered, and the suggested answers for each question are lettered. On the answer document, the rows of ovals are numbered to match the questions, and the ovals in each row are lettered to correspond to the suggested answers.

For each question, first decide which answer is best. Next, locate on the answer document the row of ovals numbered the same as the question. Then, locate the oval in that row lettered the same as your answer. Finally, fill in the oval completely. Use a soft lead pencil and make your marks heavy and black. **DO NOT USE INK OR A MECHANICAL PENCIL.**

Mark only one answer to each question. If you change your mind about an answer, erase your first mark thoroughly before marking your new answer. For each question, make certain that you mark in the row of ovals with the same number as the question.

Only responses marked on your answer document will be scored. Your score on each test will be based only on the number of questions you answer correctly during the time allowed for that test. You will NOT be penalized for guessing. **IT IS TO YOUR ADVANTAGE TO ANSWER EVERY QUESTION EVEN IF YOU MUST GUESS.**

You may work on each test ONLY when your test supervisor tells you to do so. If you finish a test before time is called for that test, you should use the time remaining to reconsider questions you are uncertain about in that test. You may NOT look back to a test on which time has already been called, and you may NOT go ahead to another test. To do so will disqualify you from the examination.

Lay your pencil down immediately when time is called at the end of each test. You may NOT for any reason fill in or alter ovals for a test after time is called for that test. To do so will disqualify you from the examination.

Do not fold or tear the pages of your test booklet.

**DO NOT OPEN THIS BOOKLET  
UNTIL TOLD TO DO SO.**

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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.

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### PASSAGE I

#### Parking Feud

[1]

There is an ominous feud fighting around my  
neighborhood, a part of town that was once a tranquil and  
idyllic place to live. The cause of the feud is parking  
spaces and the root of the problem, is that we all live on a  
cul-de-sac (a dead-end street with a place to turn around at  
its end). Cul-de-sacs are normally peaceful places to live  
because there is no through traffic.

[2]

The street, which curves past twenty  
houses and several apartment buildings and  
twists around small islands of shrubbery, looks  
pleasant enough. Cul-de-sacs, after all, are designed  
to reduce traffic and thus provide privacy, safety,  
and quiet. My neighbors and I used to enjoy the  
quietness of our street.

1. A. NO CHANGE  
B. taking over  
C. undertaking  
D. challenging near
  
2. F. NO CHANGE  
G. spaces, and the root of the problem,  
H. spaces, and the root of the problem  
J. spaces and, the root of the problem
  
3. A. NO CHANGE  
B. forms around small pieces  
C. winds under little amounts  
D. goes near some bits



[3]

Rapidly, however, the peace in my neighborhood

4

is vanishing. Part of the problem, is that we all own

5

to many cars. When this area was developed, many  
of the households that moved in owned just one car.

6

But our families grew larger, and our children became  
older and, now it seems as though two or three cars aren't  
enough. The street is always lined with our parked cars.

7

[4]

If we lived on a through street, such extravagance  
might be a bit more easily accommodated. We might  
always try to park as close to home as possible, but if all  
the nearby spaces are taken, we could drive around the  
block until we found a space. Then, grumbling heavily,  
walking home. In a cul-de-sac neighborhood, however, the

9

parking options are few. <sup>10</sup> Along our entire street, it is  
possible to find not a single place to park a car.

[5]

In fact, in my neighborhood this evening,

there are sure to be, tire's squealing, horns honking,

11

and car doors slamming. We like each other, the  
<sup>12</sup>  
frustration is now nearly uncontrollable. Soon, I'm afraid,

4. F. NO CHANGE  
G. Rapidly, therefore,  
H. As a result, rapidly,  
J. Moreover, rapidly,

5. A. NO CHANGE  
B. problem is, that  
C. problem is that  
D. problem is that,

6. F. NO CHANGE  
G. way to many  
H. too much  
J. too many

7. A. NO CHANGE  
B. older, and now  
C. older and now,  
D. older, and, now

8. F. NO CHANGE  
G. more easy  
H. more easier  
J. more easy to

9. A. NO CHANGE  
B. we would walk  
C. we were walking  
D. having to walk

10. At this point, the writer is considering adding the following true statement:

*Cul-de-sac* is a French term meaning “bottom of the bag.”

Should the writer make this addition?

- F. Yes, because it would enlarge the reader's knowledge about cul-de-sacs.  
G. Yes, because it supports the idea that searching for a parking place is like shopping.  
H. No, because it would detract from the humor of the last paragraph of the essay.  
J. No, because it does not directly relate to the subject of Paragraph 4.

11. A. NO CHANGE  
B. be tire's  
C. be, tires  
D. be tires

12. F. NO CHANGE  
G. other, but  
H. other but,  
J. other, however;

those of us, who return home late,<sup>13</sup> will have to spend the evening double-parked in our cars. We will be served

supper in our cars, and in the final analysis we will, read,<sup>14</sup> nap, or listen to the radio in our cars—ready in a moment

to seize a free space or move the car if the police make one of their increasingly frequent stops in our once-quiet neighborhood.

## PASSAGE II

### The Harmony of Jean Toomer's *Cane*

[1] By his own admission, author

Jean Toomer led an unfocused early life. [2] When *Cane* his unconventional book was published in 1923,<sup>16</sup> some critics felt it reflected the author's lack of direction.

[3] Those reviewers were mystified: what sort of work was this? [4] While each piece explored African American life in the early twentieth century, the book as a whole seemed to follow no clear pattern. 17

[5] *Cane* combined short stories,<sup>18</sup> poetry, and even

a short play. 19

Other reviewers, as well,<sup>20</sup> enthusiastically praised the book. They recognized strength in the varied styles and the

13. A. NO CHANGE  
B. us who return home, late,  
C. us who return home late,  
D. us who return home late

14. E. NO CHANGE  
G. therefore  
H. then  
J. nevertheless

15. A. NO CHANGE  
B. or moving  
C. while they move  
D. or having to move

16. F. NO CHANGE  
G. his unconventional book *Cane* was published in 1923,  
H. *Cane* was published in 1923, his unconventional book,  
J. his unconventional book was published in 1923, *Cane*,

17. If the writer were to delete the phrase "in the early twentieth century" from the preceding sentence, the sentence would primarily lose:

- A. an explanation for why the book seems to lack a pattern.  
B. a biographical detail about the author of the book.  
C. an indication of when the book was published.  
D. information about the setting of the book.

18. F. NO CHANGE  
G. stories (which emerged as a distinct literary form in the nineteenth century),  
H. stories, many having been first published in magazines,  
J. stories, including one entitled "Box Seat,"

19. For the sake of the logic and coherence of this paragraph, Sentence 5 should be placed:
- A. where it is now.  
B. before Sentence 1.  
C. after Sentence 1.  
D. after Sentence 3.

20. F. NO CHANGE  
G. however,  
H. besides,  
J. thus,



book's underlying depth and unity. These critics argued that while the various parts of *Cane* might seem disconnected, they could also be seen as linked by <sup>21</sup> common themes and imagery.

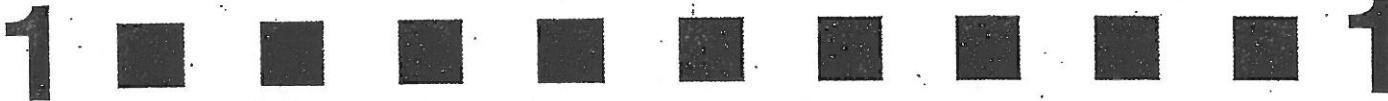
The title represents a key image that repeatedly recurs <sup>22</sup> throughout the book. Toomer uses sugar cane, a tall plant grown in warm climates, as a symbol not only of refreshing nourishment but also, in its cloying sweetness, of smothering excess. For example, in one poem, the image of the cane rustling in the wind is described as a <sup>23</sup> soft, sweet song. In a later story, however, the cane's

overpowering scent "drenches" the workers who cut the <sup>24</sup> cane stalks, forcing them to inhale its syrupy thickness with every breath.

Sugar cane comes to represent contradictions and ambivalence as Toomer weaves the image into situations and settings that are both nurturing and disturbing. <sup>25</sup> <sup>26</sup>

Love struggles against racism, determination strives <sup>27</sup> to overcome poverty, beauty battles corruption,

21. A. NO CHANGE  
B. fastened  
C. combined  
D. attached
22. E. NO CHANGE  
G. recurs again and again  
H. recurs in many places  
J. recurs
23. Which choice would be most appropriate in the context of this sentence?  
A. NO CHANGE  
B. symbol  
C. sound  
D. sense
24. Which of the following alternatives to the underlined portion would NOT be acceptable?  
E. who are cutting  
G. as they cut  
H. and cut  
J. cutting
25. A. NO CHANGE  
B. from representing  
C. with representing  
D. up to represent
26. At this point, the writer is considering adding the following true statement:  
Much of the world's refined table sugar comes from sugar cane.  
Should the writer add this sentence here?  
E. Yes, because it helps explain why Toomer's image of sugar cane might seem both nurturing and disturbing.  
G. Yes, because it provides further background information about the uses of sugar cane.  
H. No, because it doesn't develop the point being made about Toomer's use of the sugar cane image.  
J. No, because it fails to mention the other sources of refined table sugar.
27. A. NO CHANGE  
B. that struggles  
C. struggling  
D. OMIT the underlined portion.



and solitary characters want to find friends. Even  
when the book's setting shifts from the temperate

South, to the colder North,<sup>28</sup> cane remains a pervasive  
and powerful image.<sup>29</sup>

Today *Cane* is taught in many classrooms and is  
highly regarded by literary scholars. For many readers,  
Toomer has created a memorable central image that  
connects his conflicting accounts of joy and pain. <sup>30</sup>

28. Which choice best expresses this idea in a style that is consistent with the preceding statements in this sentence?

- F. NO CHANGE
- G. those who are isolated search for company.
- H. isolation can turn into friendship.
- J. loneliness seeks companionship.

29. A. NO CHANGE

- B. South to the colder North,
- C. South; to the colder North
- D. South to the colder North;

30. Given that all of the following statements are true, which one, if added here, would most effectively conclude and summarize this essay?

- F. A world both sweet and bitter is contained in his deceptively simple title, *Cane*.
- G. *Cane* was one of the products of a period of African American artistic flourishing known as the Harlem Renaissance.
- H. Later in his life, Toomer became interested in mystical philosophy and wrote a book on the subject.
- J. After *Cane*, Toomer for the most part turned away from poetry and fiction.

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### PASSAGE III

#### Jade: The Stone of China

[1]

From the beginning of recorded Chinese history until the end of the Ch'ing dynasty, jade held a significant place in China. China had an abundant supply of jade, which contributed to the stone's influence in the culture. The Chinese also regarded the physical characteristics of jade with fascination. Jade is hard; making it difficult to chip or flake, but once polished, its surface is smooth and silky to the touch. Variations in color—and they were frequent—

<sup>32</sup>

31. A. NO CHANGE  
B. hard. Making  
C. hard making  
D. hard, making

32. Given that all of the choices are true, which one would provide the most detailed and specific information at this point in the essay?

- F. NO CHANGE
- G. color—interesting shades and hues as well—
- H. color, which made a contribution to this beautiful stone,
- J. color, from pure white to shades of green and brown,

added further interest to the forms fashioned by Chinese artisans. <sup>33</sup>

[2]

From the Sung dynasty to the Ming dynasty, jade carvings assumed practical

<sup>34</sup>

forms—as axes, chisels, and other tools as well,  
<sup>35</sup>  
 as ornamental forms, such as earrings and pendants. Jade also inspired them to create objects that were both useful  
<sup>36</sup>  
 and decorative. Many cups and containers were embellished with birds, peach blossoms, and other adornments inspired by nature. An entire cup, for example, was fashioned in the shape of a lotus leaf.

[3]

Decorations could be very complex. A brush holder from the Ch'ing dynasty had carvings that covered every inch of their surface;

<sup>37</sup>

the elaborate details included representations of clouds,  
<sup>38</sup>  
 trees, mountains, and people. This scene depicted in jade told the story of scholarly recluses who, in ancient times, retreated to mountain caves to escape the warring factions with their books that threatened their way of life.

<sup>39</sup>

33. If the writer were to delete the phrase “to the forms fashioned by Chinese artisans” from the preceding sentence, the essay would primarily lose:
- A. a detail that helps link Paragraphs 1 and 2.
  - B. support for a point made previously.
  - C. a detail that helps make a comparison.
  - D. an unnecessary detail that repeats a point made previously.
34. F. NO CHANGE  
 G. created  
 H. asserted  
 J. assigned
35. A. NO CHANGE  
 B. forms; as axes, chisels, and other tools, as well  
 C. forms—as axes, chisels, and other tools—as well  
 D. forms. As axes, chisels, and other tools—as well
36. F. NO CHANGE  
 G. was also inspirational in creating  
 H. also inspired to create the  
 J. also inspired artists to create
37. A. NO CHANGE  
 B. it's  
 C. its  
 D. there
38. Given that all of the choices are true, which one would provide the most effective transition to the sentence that follows?
- F. NO CHANGE
  - G. however, jade cannot merely be measured in terms of artistic value.
  - H. these carvings were painstakingly detailed.
  - J. artisans used metal tools to make these very intricate carvings.
39. The best placement for the underlined portion would be:
- A. where it is now.
  - B. after the word *retreated*.
  - C. after the word *escape*.
  - D. after the word *life* (ending the sentence with a period).

[4]

[1] In addition to its aesthetic importance, there was with jade a spiritual value stemming from its early associations with traditional Taoist beliefs.

[2] This belief inspired Taoist physicians having created

a digestible form of jade powder, that he hoped would

increase human longevity. [3] By these traditional beliefs  
in the extraordinary powers of jade invested the stone  
with a significance far beyond its usefulness as a tool or  
as a medium for artistic expression. [45]

40. F. NO CHANGE  
G. value, which was spiritual, stemmed  
H. jade had spiritual value, stemming  
J. a spiritual value stemmed

41. A. NO CHANGE  
B. creating.  
C. to create  
D. to have created

42. F. NO CHANGE  
G. he hopes  
H. it hoped  
J. they hoped.

43. A. NO CHANGE  
B. Regarding these  
C. These  
D. This

44. Which choice would most effectively enable this sentence to conclude the essay by summarizing one of its main points?  
F. NO CHANGE  
G. its fascinating variations in color.  
H. as a functional, useful object.  
J. its depictions of ancient times.

45. Upon reviewing Paragraph 4 and finding that some information has been left out, the writer composes the following sentence incorporating that information:  
The stone was thought to have the power to protect the human body from decay.  
This sentence would most logically be placed:  
A. before Sentence 1.  
B. after Sentence 1.  
C. after Sentence 2.  
D. after Sentence 3.

## PASSAGE IV

The Woods

Until I was nine, my family lived in an old house surrounded by what we called "the woods," a term that only begins to describe the place where my sisters and I played. More than a bunch of trees, the woods,  
each distinguished as domains in a set by what we  
found or did there.

46. F. NO CHANGE

G. More than a bunch of trees, the woods was a set of domains, each distinguished by what we found or did there.

H. We found or did things that made the woods have domains, more than a bunch trees.

J. Finding and doing things, the woods became a set of domains, each distinguished by us.



In summer, we followed an overgrown path to a meadow of wild strawberries. With as much patience as optimism, we set berries on our shoulders, hats, or outstretched hands, hoping to attract a passing bird or two. Beyond the meadow, a brook ran beneath a hickory tree in whose shadow we looked for polliwogs or, later, the tiny frogs they became.<sup>47</sup>

We became builders in the woods, establishing our forts on the edge of an apple orchard. One fort had stone walls and an overhead roof of pine boughs.<sup>48</sup>

Another, made from an old blanket, smelled like our attic<sup>49</sup>

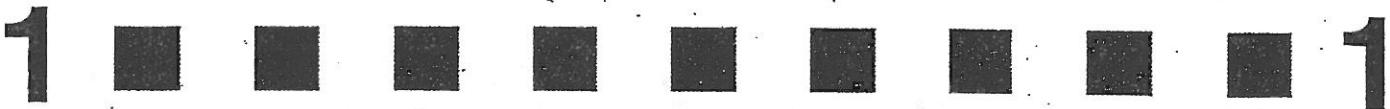
at home. Our sturdiest fort circled a beech tree and<sup>50</sup> featured a ladder up the trunk to a "second floor." In winter, there was an endless supply of the best building material of all, snow.

Meanwhile, we set out for the field beyond the<sup>51</sup> orchard. There among the wildflowers lay a door, its presence a mystery; we didn't care to solve. To us it<sup>52</sup>

became a stage, on which we tap-danced or a raft on<sup>53</sup> which we crossed the high seas in search of treasure. Occasionally, we would hide treasure of our own—a few coins or pieces of candy having an air of secrecy and a pair<sup>54</sup>

of broken binoculars, we took turns watching for invaders<sup>55</sup> the horizon.

47. Which of the following alternatives to the underlined portion would NOT be acceptable?
- A. searched
  - B. looked around
  - C. glanced about
  - D. examined
48. F. NO CHANGE  
G. a  
H. additionally it also had a  
J. on top in addition it had a
49. A. NO CHANGE  
B. Another made from an old blanket  
C. Another made from an old blanket,  
D. Another, made from an old blanket
50. F. NO CHANGE  
G. most sturdiest  
H. more sturdier  
J. sturdiest of
51. A. NO CHANGE  
B. Once in a while,  
C. Once and for all,  
D. At the same time;
52. F. NO CHANGE  
G. mystery, we  
H. mystery. We  
J. mystery we
53. A. NO CHANGE  
B. stage: on which we tap-danced,  
C. stage; on which we tap-danced,  
D. stage on which we tap-danced
54. F. NO CHANGE  
G. candy surrounded by  
H. candy. With  
J. candy with
55. The best placement of the underlined portion would be:
- A. where it is now.
  - B. after the word *binoculars* (but before the comma).
  - C. after the word *turns*.
  - D. after the word *horizon* (ending the sentence with a period).



Part of the woods was a swamp. Over the years, it swallowed an assortment of shoes, boots, and sandals. It was a grim place on the day we found a baby bird lying <sup>56</sup> dead in the tall reeds. We buried the creature, placing wildflowers, berries, and a few shiny stones from the brook into its tiny grave.

"Where have you been?" the grown-ups would ask us as we stumbled in the back door after one of our gritty excursions. Our answer—the woods—wasn't a lie, but it

never seemed like the complete truth either. <sup>58</sup>

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

- F. came across
- G. came upon
- H. found upon
- J. discovered

57. A. NO CHANGE  
B. it's  
C. its'  
D. whose

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

- F. outings.
- G. destinations.
- H. adventures.
- J. expeditions.

59. If the writer were to delete the phrase "—the woods—" from the preceding sentence, the paragraph would primarily lose:

- A. an indication that the grown-ups knew where the children spent their play time.
- B. the final indication that the children pride themselves on being secretive about their whereabouts.
- C. a detail that maintains the coherence of the paragraph and concludes the essay with a clear reference to its subject.
- D. an unnecessary reference to what is already stated elsewhere in the paragraph.

Question 60 asks about the preceding passage as a whole.

60. Suppose the writer had intended to write an essay revealing personal knowledge of a particular place. Would this essay accomplish the writer's goal?

- F. Yes, because the essay indicates that the narrator knew a great deal about the woods as a result of playing there as a child.
- G. Yes, because the essay establishes that the narrator continues to visit and learn about the woods, a significant part of a happy childhood.
- H. No, because the knowledge that the narrator gained cannot accurately be described as scientific information about the woods.
- J. No, because the essay's descriptions of the woods may no longer be accurate, as time has passed since the narrator was a child.



PASSAGE V

**Not Just Pocket Change**

My interest in coin collecting began when I was a child digging in my backyard. In a tulip bed underneath the kitchen window, I expected to find a dinosaur tooth or maybe a tunnel to a magical underworld.

Unearthed, I didn't expect to find several old coins.

A few corroded pennies, their coppery surfaces pitted

and had been tarnished, blended in with the soil.

I noticed a nickel in the dirt too and wiped it off on my jeans. Larger and heavier than any nickel I'd held before, it felt strange in my palm. As I read, the

modern world seemed to fall away.

Weeks later, when the novelty of the coins had faded, I exchanged them with a classmate for a bag of marbles. When my older siblings heard of the trade, they teased me for giving away a fortune. Out of pride, I insisted they were wrong, but I wondered secretly if they were right.

That's when I started researching and collecting coins in earnest. By the time I learned that coin collecting, or numismatics, had begun in the Italian Renaissance, I

am developing a habit of checking every handful of change for a rare or old coin—or one that was both. Every so often I'd find a Lincoln penny with the “wheat” design on the

61. A. NO CHANGE  
B. The unearthing of several old coins but it wasn't what I expected.  
C. Out from under the earth, my expectation was not to find several old coins.  
D. I didn't expect to unearth several old coins.
62. F. NO CHANGE  
G. they were  
H. were  
J. OMIT the underlined portion.
63. Which choice provides information that is most relevant to this sentence and this paragraph?  
A. NO CHANGE  
B. As I read the date, 1895, the  
C. It was then that the  
D. The
64. F. NO CHANGE  
G. away, like a curtain coming down on the past.  
H. away, like a screen between now and then.  
J. away, like a mist hovering over the present.
65. A. NO CHANGE  
B. begun  
C. had began  
D. had it's beginning
66. F. NO CHANGE  
G. have developed  
H. had developed  
J. have been developing

back. One time a vending machine gave me a "buffalo" nickel in change. Another time my weekly allowance included a dime with an incorrect mint mark; such a defect makes a coin particularly valuable.

Collecting coins brings other time periods into focus. For instance, the change in the metal composition of U.S. coins, minted during World War II, points out the

adjustments made as part of the war effort. [69]  
Information, stories, a sense of other settings and other

lives—these all accumulate to the appeal of coins for

collectors like me. Nevertheless, I enjoy attaching stories  
71 to the coins I own and to the coins I don't. I wonder, for

instance, where that collectible coin is now. In a bus  
driver's pocket? In a box lined with velvet? Wherever

those are, they will always clink around with all the  
    73

67. A. NO CHANGE  
B. change, there was another  
C. change then another  
D. change, another

68. F. NO CHANGE  
G. coins, minted during World War II  
H. coins minted during World War II,  
J. coins minted during World War II

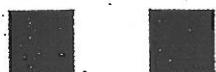
69. If the writer were to delete the preceding sentence, the essay would primarily lose:  
A. information that ties this paragraph in with the main point of the preceding paragraph.  
B. an example that supports the point the writer is making in this paragraph about the historical significance of coins.  
C. a reference to the sources that the writer relies on to verify the value of coins.  
D. details that have been included elsewhere and are unnecessarily repetitive.

70. F. NO CHANGE  
G. accumulate for  
H. add to  
J. benefit with

71. A. NO CHANGE  
B. (Do NOT begin new paragraph) I enjoy  
C. (Begin new paragraph) On the other hand, I enjoy  
D. (Begin new paragraph) I enjoy, once and for all,

72. Given that all of the choices are true, which one would help clarify the logic of this sentence by making the clearest reference back to the scene described in the opening paragraph?  
F. NO CHANGE  
G. coin worth collecting  
H. tulip bed nickel  
J. valuable coin

73. A. NO CHANGE  
B. that is, it  
C. they are, they  
D. it is, it



others in my imagination. 74

74. The writer is considering concluding the essay with the following sentence:

In conclusion, a hobby is a meaningful part of everyone's life, including mine.

Should the writer make this addition here?

- F. Yes, because it sums up the essay with a positive remark that connects the writer's and the reader's experiences.
- G. Yes, because it reinforces the point that coin collecting is one of many hobbies that the writer enjoys.
- H. No, because the essay provides information about coin collecting but stops short of suggesting that it has much meaning in the writer's life.
- J. No, because the existing final sentence is effective while this one is overly general and only loosely connected to the subject of coin collecting.

Question 75 asks about the preceding passage as a whole.

75. Suppose the writer had intended to write a brief personal essay about the pleasures of coin collecting. Would this essay fulfill the writer's goal?

- A. Yes, because the essay explains how the writer has enjoyed making a living by trading and collecting valuable coins.
- B. Yes, because the essay explains coin collecting from the point of view of someone with years of experience engaged in it.
- C. No, because the essay emphasizes that coin collecting is not as financially advantageous or as interesting as it used to be.
- D. No, because the essay explains that the narrator has many regrets about coin collecting, including the decision to give away a valuable coin.

**END OF TEST 1**

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

**2****2****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.

**DO YOUR FIGURING HERE.**

1. Mato's scores on the first 4 tests in his chemistry class were 85, 98, 92, and 77. How many points must Mato score on a fifth test to average exactly 90 points for these 5 equally weighted tests?

- A. 92
- B. 94
- C. 96
- D. 98
- E. 100

2. A point at  $(-3, 7)$  in the standard  $(x, y)$  coordinate plane is shifted down 3 units and right 7 units. What are the coordinates of the new point?

- F.  $(-10, 10)$
- G.  $(0, 0)$
- H.  $(4, 4)$
- J.  $(4, 10)$
- K.  $(10, 10)$

3. A warehouse dispatcher is responsible for the immediate delivery of 75,000 condensers. She can use only 2 different sizes of trucks for the task. Each of the larger trucks will carry a maximum of 15,000 condensers. Each of the smaller trucks will carry a maximum of 12,000 condensers. The dispatcher has 2 of the larger trucks to use. If each truck makes only a single trip, how many of the smaller trucks must be used with the 2 larger size trucks to deliver this order?

- A. 3
- B. 4
- C. 5
- D. 7
- E. Cannot be determined from the given information

4. Brian bought a pair of jeans for  $\frac{2}{3}$  of the original price of \$48.00 and a belt for 40% of its original price of \$12.50. Ignoring sales tax, what is the total amount of these purchases?

- F. \$21.00
- G. \$27.00
- H. \$30.00
- J. \$37.00
- K. \$60.50

2



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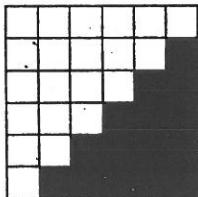
DO YOUR FIGURING HERE.

5. In isosceles triangle  $\triangle RET$ ,  $\angle E$  and  $\angle T$  are congruent and the measure of  $\angle R$  is  $94^\circ$ . What is the measure of  $\angle E$ ?

- A.  $43^\circ$   
 B.  $47^\circ$   
 C.  $48^\circ$   
 D.  $86^\circ$   
 E.  $94^\circ$

6. The largest square in the figure below is partitioned into 36 congruent smaller squares. What fraction of the interior of the largest square is black?

- F.  $\frac{5}{12}$   
 G.  $\frac{1}{2}$   
 H.  $\frac{7}{12}$   
 J.  $\frac{5}{8}$   
 K.  $\frac{5}{6}$



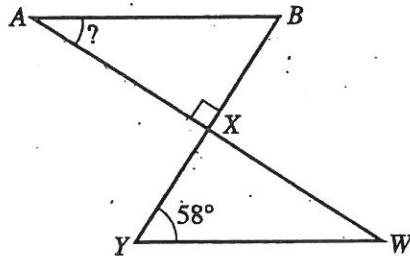
7. When  $x = -1$  and  $y = 3$ , what is the value of  $4x^2 - 3xy$ ?

- A. -5  
 B. 1  
 C. 13  
 D. 25  
 E. 45

8. Which of the following is a value for  $x$  that solves the equation  $|x - 2| = 5$ ?

- F. -3  
 G.  $\frac{5}{2}$   
 H. 3  
 J. 10  
 K. 25

9. In the figure below,  $\overline{AW}$  and  $\overline{BY}$  are perpendicular at  $X$  and bisect each other. The measure of  $\angle WYX$  is  $58^\circ$ . What is the measure of  $\angle BAX$ ?



- A.  $29^\circ$   
 B.  $32^\circ$   
 C.  $58^\circ$   
 D.  $90^\circ$   
 E. Cannot be determined from the given information

**2****2****DO YOUR FIGURING HERE.**

10. Ms. Juarez announced the grade distribution for the last book report. Of the 24 students in the class, 8 earned A's, 10 earned B's, and 6 earned C's. When a student is picked at random to be the first to present his or her book report to the class, what is the probability that the student picked had earned an A on the book report?

- F.  $\frac{1}{4}$   
G.  $\frac{1}{3}$   
H.  $\frac{5}{12}$   
J.  $\frac{1}{2}$   
K.  $\frac{4}{5}$

11. A man started a 280-mile drive with a full tank of gas in his car. At the end of the trip he spent \$23.40 to refill his car's tank with 18 gallons of gasoline selling for \$1.30 per gallon. Which of the following is an expression for the number of miles per gallon the car averaged?

- A.  $280(0.30)$   
B.  $\frac{2,340}{280}$   
C.  $\frac{2,340}{18}$   
D.  $\frac{280}{30}$   
E.  $\frac{280}{18}$

12. Jim bought 3 large decals and 2 small decals of a school logo for \$1.30. When he went home his sister asked him the price of a small decal. He remembered that each large decal costs \$.10 more than each small decal. How much did 1 small decal cost?

- F. \$.20  
G. \$.22  
H. \$.24  
J. \$.30  
K. \$.32

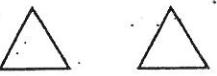
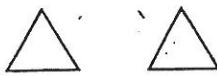
13. For what value of  $k$  is  $x = 2$  a solution of  $x^2 - 8x + k = 0$ ?

- A. -20  
B. -12  
C. 4  
D. 12  
E. 14

14. One side of square ABCD is 12 meters long. A rectangle with the same area as square ABCD has a length of 9 meters. What is the rectangle's width, in meters?

- F. 3  
G. 16  
H. 21  
J. 108  
K. 144

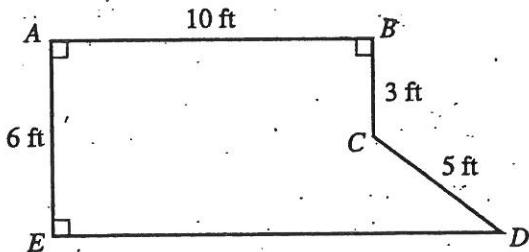
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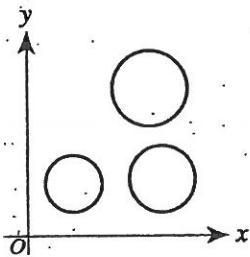
DO YOUR FIGURING HERE.

15. In polygon  $ABCDE$  shown below, the angles at  $A$ ,  $B$ , and  $E$  are right angles. What is the perimeter of the polygon, in feet?

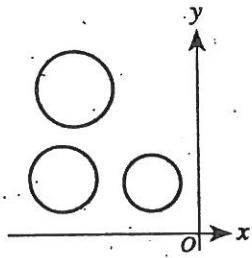


- A. 24
- B. 36
- C. 38
- D. 41
- E. 44

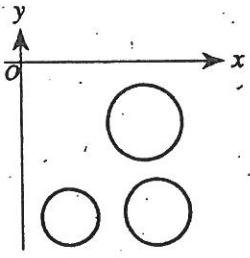
16. The figure below shows 3 circles in the standard  $(x,y)$  coordinate plane. Which of the following shows the reflection of the 3 circles across the  $x$ -axis?



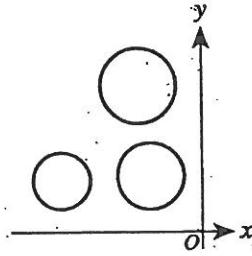
F.



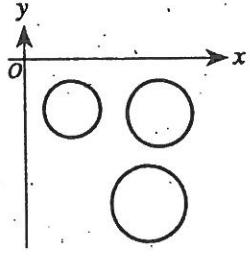
J.



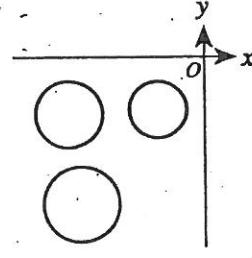
G.



K.



H.



**2****2**

17. What is the slope of any line parallel to the line  $6x + 5y = 7$ ?

- A. -6
- B.  $-\frac{6}{5}$
- C.  $\frac{6}{7}$
- D. 6
- E. 7

18. Which of the following is a possible definition for  $f(x)$  if  $f(2) = 5$ ?

- F.  $f(x) = x^2 + 1$
- G.  $f(x) = x^2 - 1$
- H.  $f(x) = x + 4$
- J.  $f(x) = x - 3$
- K.  $f(x) = 5x + 2$

19. A formula for the volume,  $V$ , of a right circular cylinder in terms of its radius,  $r$ , and its height,  $h$ , is  $V = \pi r^2 h$ . What is the height, in centimeters, of a right circular cylinder that has a volume of  $270\pi$  cubic centimeters and a radius of 3 centimeters?

- A. 30
- B. 90
- C. 279
- D. 810
- E. 2,430

20. Gerry is building a dollhouse that is to be a scale model of a house that is 36 feet high, 84 feet long, and 48 feet wide. What should be the dimensions, in feet, of the dollhouse Gerry is building if the scale of the model to the house is 1:12?

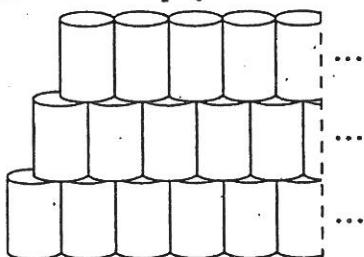
Height	Length	Width
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- F.  $\frac{3}{12}$        $\frac{7}{12}$        $\frac{4}{12}$
- G. 3      7      4
- H. 36      7      4
- J. 432      84      48
- K. 432      1,008      576

**DO YOUR FIGURING HERE.**

**2****2****DO YOUR FIGURING HERE.**

21. The manager of a grocery store asks Kamar to construct a display consisting of 10 rows of cans stacked on top of each other. The manager wants the bottom row to have 25 cans and each succeeding row to have 1 less can than the row below it. Part of 3 rows of the display is shown in the figure below. How many cans will be in the top row of the display?



- A. 14  
B. 15  
C. 16  
D. 34  
E. 35

22. One pair of corresponding sides of 2 similar triangles are 3 and 8 inches long, respectively. If the perimeter of the smaller triangle is 12 inches, what is the perimeter, in inches, of the larger triangle?

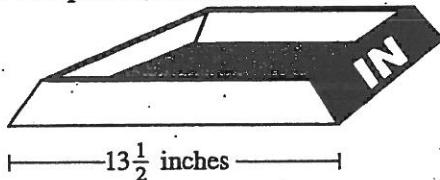
- F. 120  
G. 60  
H. 36  
J. 32  
K. 17

23. The equation shown below is true for what value of  $x$ ?  
[www.crackab.com](http://www.crackab.com)

$$3(x - 5) - 2(x - 4) = 8x$$

- A.  $-\frac{23}{7}$   
B.  $-\frac{7}{3}$   
C. -1  
D.  $-\frac{1}{7}$   
E.  $\frac{3}{7}$

24. Each of the 4 sides of the "IN" tray in an office has the shape of a trapezoid, as shown below.



The length of the bottom of each side is  $13\frac{1}{2}$  inches and the length of the top of each side is 11 inches. What is the length, in inches, of the median of each trapezoid?

- F.  $6\frac{1}{8}$   
G. 12  
H.  $12\frac{1}{4}$   
I. 14  
J. 16

[www.crackab.com](http://www.crackab.com)  
K. 16

**2****2****DO YOUR FIGURING HERE.**

25. In Abraham Lincoln's 1863 Gettysburg Address, he refers to the year 1776 as "4 score and 7 years ago." Which of the following equations, when solved for  $s$ , gives the number of years a *score* refers to?

- A.  $4s + 7 = 1,863 - 1,776$
- B.  $4s + 7 = 1,863 + 1,776$
- C.  $4s + 7 = 1,776 - 1,863$
- D.  $4s + 7 = 1,863$
- E.  $4s + 7 = 1,776$

26. What is the sum of the 2 solutions of the equation  $x^2 + x - 6 = 0$ ?

- F. -6
- G. -3
- H. -1
- J. 0
- K. 2

27. For an assignment on symmetry, Crystal created the pattern of digits shown below. Her teacher commented on the symmetry when evaluating the assignment. Which of the following is a true comment about the symmetry of this pattern?

| 8968 |

- A. The pattern has only a horizontal line of symmetry.
  - B. The pattern has both a horizontal line and a vertical line of symmetry.
  - C. The pattern has only a vertical line of symmetry.
  - D. The pattern has a rotational symmetry of  $180^\circ$ .
  - E. The pattern has a rotational symmetry of  $90^\circ$ .
28. The ratio of  $a$  to  $b$  is 3 to 1, and the ratio of  $b$  to  $c$  is 1 to 5. What is the value of  $\frac{2a+3b}{4b+3c}$ ?

- F.  $\frac{3}{16}$
- G.  $\frac{9}{19}$
- H.  $\frac{1}{2}$
- J.  $\frac{5}{7}$
- K.  $\frac{18}{19}$

29. Becky has 76 solid-colored disks that are either red, blue, or green. She lines them up on the floor and finds that there are 4 more red disks than green and 6 more green disks than blue. How many red disks does she have?

- A. 10
- B. 20
- C. 24
- D. 26
- E. 30

**2****2****DO YOUR FIGURING HERE.**

30. The probability that a specific event,  $E$ , happens is denoted  $P(E)$ . The probability that this event does not happen is denoted  $P(\text{not } E)$ . Which of the following statements is *always* true?

- F.  $0 < P(\text{not } E) < P(E)$
- G.  $P(\text{not } E) > 1$
- H.  $P(E) < P(\text{not } E)$
- J.  $P(E) > P(\text{not } E)$
- K.  $P(E) + P(\text{not } E) = 1$

31. Which of the following expressions is equivalent to  $\sqrt[3]{a^9}$ , where  $a$  is a real number?

- A.  $a^{-3}$
- B.  $a^{\frac{1}{3}}$
- C.  $|a^3|$
- D.  $a^3$
- E.  $a^6$

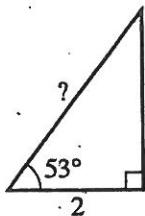
32. Which of the following is equivalent to  $(y + 5)^3$ ?

- F.  $3y + 15$
- G.  $y^2 + 10y + 25$
- H.  $y^3 + 15$
- J.  $y^3 + 125$
- K.  $y^3 + 15y^2 + 75y + 125$

33. In the right triangle shown below, a leg is 2 meters long and its adjacent acute angle measures  $53^\circ$ . About how many meters long is the hypotenuse?

(Note:  $\sin 53^\circ \approx 0.80$   
 $\cos 53^\circ \approx 0.60$   
 $\tan 53^\circ \approx 1.33$ )

- A. 2.5
- B. 2.7
- C. 3.3
- D. 3.5
- E. 3.6



34. Boaters use 5 small flags of different colors to send messages to people in other boats. All 5 flags are flown on 1 pole, and the messages are conveyed by the order of the flags from the top of the pole downward. In how many different orders can the 5 flags be flown?

- F. 5
- G. 15
- H. 24
- J. 25
- K. 120

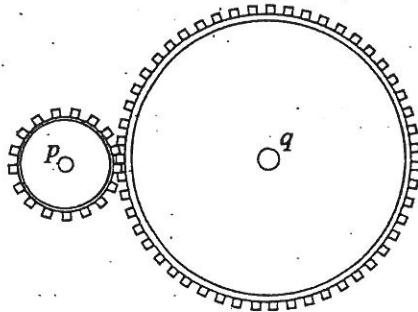
**2****2**

35. What is the least common multiple of the numbers 1, 2, 3, 4, 5, and 6?

- A. 720
- B. 180
- C. 60
- D. 30
- E. 1

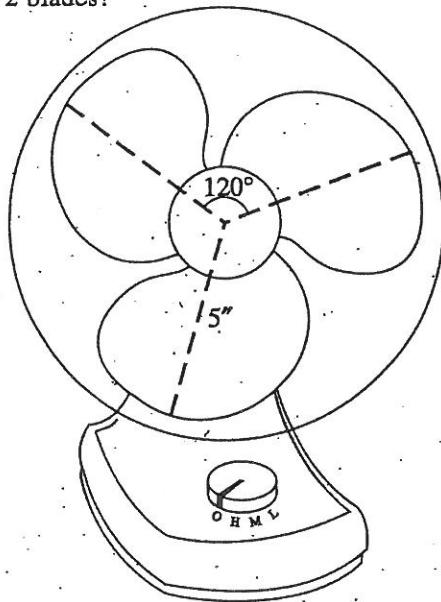
**DO YOUR FIGURING HERE.**

36. As shown below, gears  $p$  and  $q$  mesh smoothly so that they turn simultaneously with each other. Each gear rotates about its fixed center. If gear  $p$  has 17 teeth and gear  $q$  has 51 teeth, how many revolutions will gear  $q$  make if gear  $p$  makes 15 revolutions?



- F. 3
- G. 5
- H. 15
- J. 45
- K. 51

37. A small electric fan, shown below, has 3 blades. The angle between each 2 blades is  $120^\circ$ , and the tip of each blade is 5 inches from the center of the fan, as shown. To the nearest 0.1 inch, how many inches apart are the tips of 2 blades?

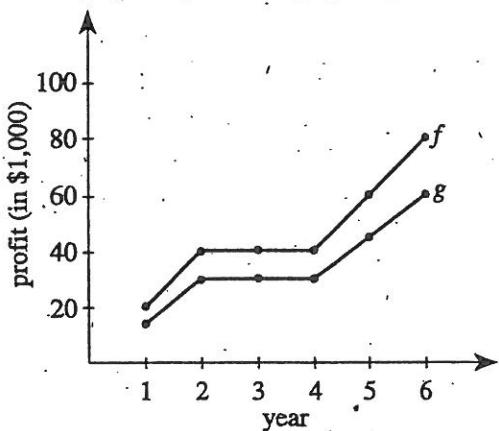


- A. 8.7
- B. 7.1
- C. 5.0
- D. 4.3
- E. 2.5

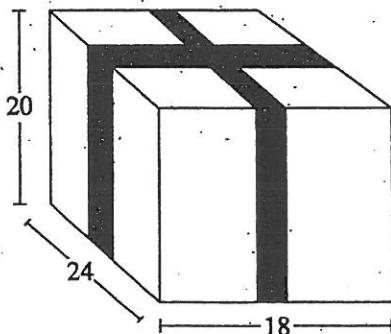
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**DO YOUR FIGURING HERE.**

38. The function  $f$  shown in the graph below represents the projection of yearly profits for the Rip It Up toy company. The actual profits are represented by the graph of the function  $g$ . Which of the following descriptions is the most accurate explanation for the variation between the graph of  $g$  and the graph of  $f$ ?



- F. The yearly profits were only  $\frac{3}{4}$  as large as projected.  
 G. The yearly profits were consistently \$10,000 less than projected.  
 H. The yearly profits were greater than projected.  
 J. The 2 graphs show no difference in the yearly profits.  
 K. The yearly profits started to decline after several years and continued to decline through the 6th year.
39. To prepare 8 boxes of books for shipping, LaRonda will put 2 strips of strapping tape around each box, as shown below. Each strip of tape goes all the way around the box, and the strips of tape meet at right angles on the top and bottom of the box. Each box is 24 inches long, 18 inches wide, and 20 inches high. What is the minimum number of inches of strapping tape LaRonda will need to prepare all 8 boxes for shipping?



- A. 164  
 B. 496  
 C. 656  
 D. 992  
 E. 1,312

2



2

DO YOUR FIGURING HERE.

40. The interior angle measures of a triangle are in the ratio 3:8:9. What is the measure of this triangle's largest interior angle?

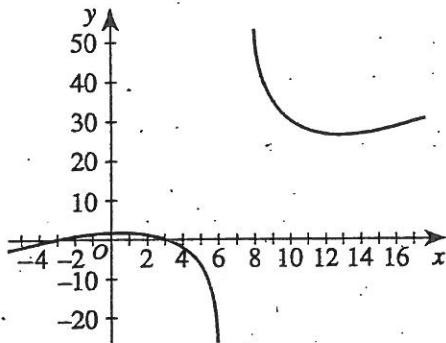
- F.  $20^\circ$
- G.  $27^\circ$
- H.  $72^\circ$
- J.  $81^\circ$
- K.  $90^\circ$

41. The graph of  $\frac{x^2}{64} + \frac{y^2}{36} = 1$  has an  $x$ -intercept at which of the following points?

- A. (64,0)
- B. (36,0)
- C. (16,0)
- D. (-8,0)
- E. (-6,0)

Use the following information to answer questions 42–44.

Consider the rational function  $f(x) = \frac{x^2 - 9}{x - 7}$ , whose graph is shown in the standard  $(x,y)$  coordinate plane below.



42. What is the value of  $f(x)$  at  $x = 4$ ?

- F. 4
- G. 2
- H.  $\frac{5}{3}$
- J. -1
- K.  $-\frac{7}{3}$

43. What is the domain of  $f(x)$ ?

(Note: The domain of a function is all the  $x$ -values for which the function is defined.)

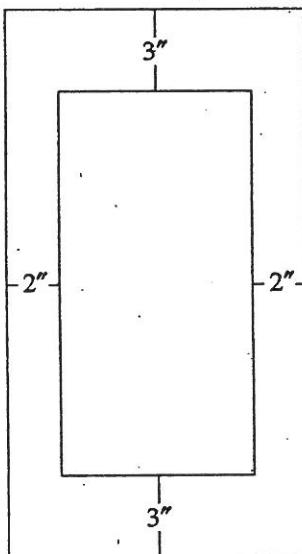
- A. All real values of  $x$  except  $\pm 3$
- B. All real values of  $x$  except  $\frac{9}{7}$
- C. All real values of  $x$  except 7
- D. All real values of  $x$  except  $\pm 3$  and 7
- E. All real values of  $x$  where  $x \leq -6$  or  $x \geq 8$

**2****2****DO YOUR FIGURING HERE.**

44. How many horizontal and/or vertical asymptotes are there for the graph of  $f(x)$ ?

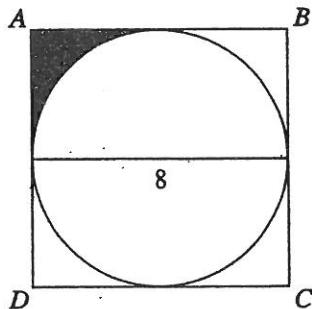
- E. 4
  - G. 3
  - H. 2
  - J. 1
  - K. 0
- 

45. The area of a rectangular piece of poster board is 220 square inches. A rectangular photograph that is twice as tall as it is wide is glued to the poster board so that the poster board extends 3 inches beyond the photograph on the top and bottom and 2 inches beyond the photograph on the left and right sides, as shown below. How many inches wide is the photograph?



- A. 3
- B. 4
- C. 7
- D. 10
- E. 14

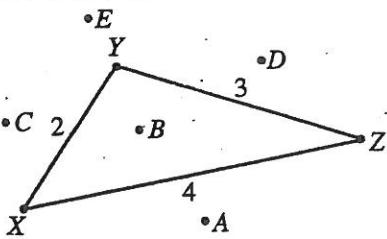
46. A circle with a diameter of 8 inches is inscribed in square  $ABCD$ , as shown below. What is the area, in square inches, of the shaded region?



- F.  $64 - 64\pi$
- G.  $64 - 16\pi$
- H.  $16 - 4\pi$
- I.  $16 - \frac{16\pi}{4\pi}$
- K.  $\frac{16}{4\pi} - 16$

**2****2**

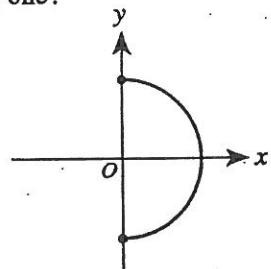
47. The side lengths of  $\triangle XYZ$ , shown in the figure below, are in centimeters. One of the 5 points  $A-E$  is the center of the circle that goes through points  $X$ ,  $Y$ , and  $Z$ . Which point is the center?



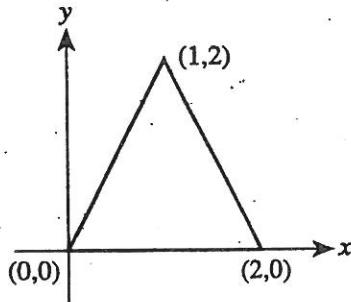
DO YOUR FIGURING HERE.

48. Sven obtained the weight,  $y$  pounds, and shoe size,  $x$ , of 25 randomly selected male students at his school. He determined that the line best fitting his data was given by the equation  $y = \frac{40}{3}x + \frac{110}{5}$ . He used this line to predict the weight of a new male student who wears size  $9\frac{1}{2}$  shoes. Compared to this student's actual weight of 165 pounds, the prediction of his weight from Sven's line was:

- F. too high by less than 1 pound.
  - G. too high by more than 1 pound.
  - H. too low by less than 1 pound.
  - J. too low by exactly 1 pound.
  - K. too low by more than 1 pound.
49. Shown in the standard  $(x,y)$  coordinate plane below, the graph of  $x^2 + y^2 = 1$  is restricted by one of the following conditions. Which one?



- A.  $x \leq 0$
  - B.  $x \geq 0$
  - C.  $x \geq 0$  and  $y \geq 0$
  - D.  $y \leq 0$
  - E.  $y \geq 0$
50. The triangle shown in the standard  $(x,y)$  coordinate plane below has vertices as marked. If each coordinate of each vertex is multiplied by 4, what will be the area, in square coordinate units, of the triangle with the resulting points as its vertices?



- F. 4
- G. 8
- H. 16
- J. 32
- K. 64

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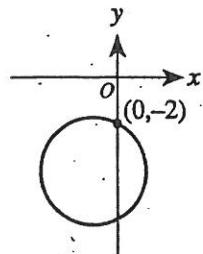


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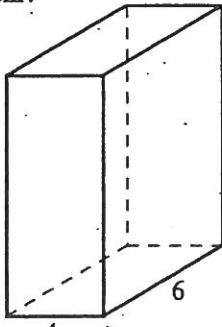
DO YOUR FIGURING HERE.

51. A circle with center  $(-1, -4)$  is shown in the standard  $(x, y)$  coordinate plane below. Which of the following is an equation of the line that is tangent to the circle at the point  $(0, -2)$ ?

- A.  $y = -\frac{1}{2}x - 2$
- B.  $y = -\frac{1}{2}x + 2$
- C.  $y = \frac{1}{2}x + 2$
- D.  $y = 2x - 2$
- E.  $y = 2x + 2$



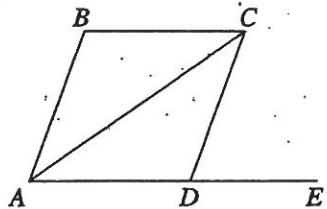
52. The right rectangular prism shown below has a base that is 4 meters by 6 meters and a volume of 240 cubic meters. What is the total surface area, in square meters, of all 6 faces of the prism?



- F. 248
- G. 240
- H. 144
- J. 124
- K. Cannot be determined from the given information

53. In the figure below,  $\overline{AC}$  is the longer diagonal of rhombus  $ABCD$  and  $E$  is on  $\overleftrightarrow{AD}$ . The measure of  $\angle BAC$  is  $m^\circ$ . What is the measure of  $\angle CDE$ , in terms of  $m$ ?

- A.  $m^\circ$
- B.  $2m^\circ$
- C.  $\frac{1}{2}m^\circ$
- D.  $90^\circ - m^\circ$
- E. Cannot be determined from the given information



54. Which of the following is a solution of the equation  $2^{x^2-3x-2} = 256$ ?

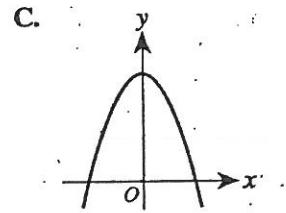
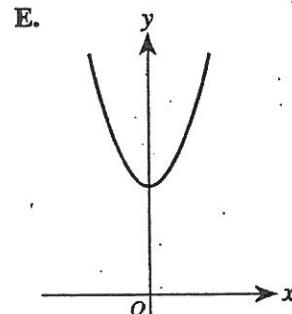
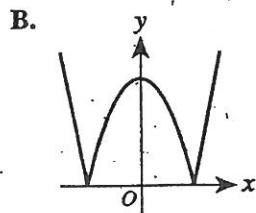
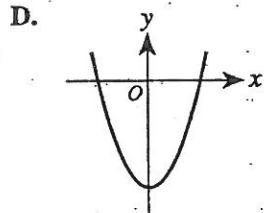
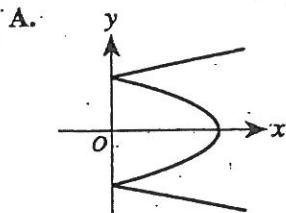
- F.  $\frac{3 + \sqrt{1,041}}{2}$
- G.  $\frac{3 + \sqrt{17}}{2}$
- H.  $-5$
- J.  $2$
- K.  $5$

2



2

55. Consider the functions  $f(x) = |x|$  and  $g(x) = -x^2 + a$ . One of the following graphs is the graph of  $y = f(g(x))$  in the standard  $(x,y)$  coordinate plane, for some  $a > 0$ . Which graph is it?



56. Which of the following has a greater value than all the others for all values of  $x$  in the interval  $0 < x < 1$ ?

- F.  $-x$
- G.  $|x|$
- H.  $\sqrt{x}$
- J.  $x^2$
- K.  $x^3$

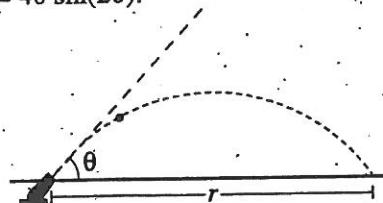
57. For positive real numbers  $a$ ,  $b$ , and  $c$  such that  $2a = \frac{b\sqrt{2}}{2} = \frac{c\sqrt{2}}{2.5}$ , which of the following is true?

- A.  $a > b > c$
- B.  $b > a > c$
- C.  $b > c > a$
- D.  $c > a > b$
- E.  $c > b > a$

DO YOUR FIGURING HERE.

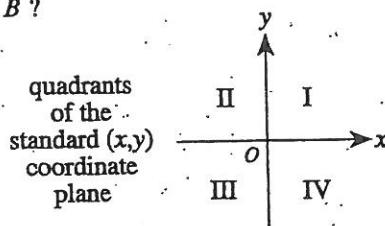
**2****2****DO YOUR FIGURING HERE.**

58. The figure below shows the path of a certain projectile launched from the ground at an angle of  $\theta$ . The horizontal range,  $r$ , of this projectile when launched from the ground at a speed of 20 meters per second is modeled by  $r = 40 \sin(2\theta)$ .



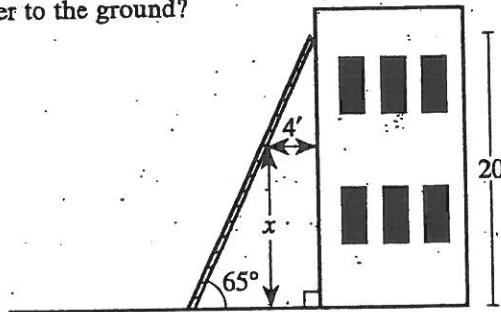
For this model, the angle measure  $\theta$  that results in the greatest horizontal range,  $r$ , is  $45^\circ$  because:

- F.  $2 \sin \theta$  is greater than  $\sin \theta$ .  
 G.  $\sin 90^\circ$  is as large as sine can get.  
 H.  $\sin 45^\circ$  is as large as sine can get.  
 J.  $\sin 45^\circ$  is about 0.707.  
 K.  $\sin 2\theta$  is greater than  $\sin \theta$ .
59. The vertex of  $\angle A$  is the origin of the standard  $(x,y)$  coordinate plane shown below. One ray of  $\angle A$  is the positive  $x$ -axis. The other ray,  $\overrightarrow{AB}$ , is positioned so that  $\sin A < 0$  and  $\cos A > 0$ . In which quadrant, if it can be determined, is point  $B$ ?



- A. Quadrant I  
 B. Quadrant II  
 C. Quadrant III  
 D. Quadrant IV  
 E. Cannot be determined from the given information

60. In the figure below, a ladder on level ground rests against the side of a building. The ladder reaches a point on the building that is 20 feet above ground. The angle formed by the ladder and the ground is  $65^\circ$ . A point on the ladder is 4 feet from the wall. What is the vertical distance  $x$ , in feet, from this point on the ladder to the ground?



- F.  $20 - 4 \tan 65^\circ$   
 G.  $20 - 4 \sin 65^\circ$   
 H.  $20 - 4 \cos 65^\circ$   
 J.  $16 \tan 65^\circ$   
 K.  $16 \sin 65^\circ$

**END OF TEST 1**

**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 four 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.

## Passage I

**PROSE FICTION:** This passage is adapted from the novel *Power* by Linda Hogan (©1998 by Linda Hogan).

Ama Eaton isn't really my aunt. I call her that because it's what my mother called her the first time I came here with my uncles. Ama's about the same age as my mother, and they are cousins in a roundabout way, but Mama calls her that out of respect for what she knows and who she is. Mama respects her and is jealous. Mama's made her choices and they are different. She'd like to learn from the old people, live the way we used to, but she wants it modern, too. Ama says 5 it's not about choices but about heart and heart is what Mama's low on. Because of how Ama lives, she's a woman both admired and ridiculed, sometimes by the same people and in the same moment of time. What she's got is herself, and that's all she has. She has no 10 lights or television or washing machine, but sometimes, even so, I think she's got more than the rest of us because she believes in herself, in what she does. It's 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 the way she lives in this place.

Since the first time I was here, I've kept coming back, but I come alone now. The first time I came was 20 when my uncles sent me to ask her if they could cut some trees nearby. I stood in front of her, a small girl, but not as afraid of her as my uncles were. Her eyes were the color of river mud after the wash of a storm, her neck too bony, her collarbone protruding. I stood 25 here with something like courage, on this very porch, and asked her about the trees.

She looked me over like she was thinking all the same things about me, then asked, "Which trees?"

I could smell fish frying behind her, in her house.

I pointed. "Those ones that are dying out there. We'll bring you back some of the wood," I said. "Uncle Sonny says you could use some."

"All right. Go ahead." And that was all we said. 35 She turned and went back to the fish dinner cooking on the stove. She had a screen door then. I had seen her through the screen. And I saw her older than she is. But when I went back to help take the wood to her, she invited me in and gave me a glass of sweet tea to drink.

40 I sat down with her at the table and we talked, and she looked nice then, her hair shiny and clean around her shoulders, her eyes soft.

"You know my mother," I said, taking in her hair, her hands that looked small and old from hard work. 45 "She's your cousin." And she said, "Yes, I do, and you're nothing like her at all." That was what won me over to Ama.

After that, they told me not to be going out to her place. But I come here anyway and I help her out and 50 no one says much to me about it. I bring her ice sometimes, or sugar for her tea, or other small things I pilfer from my mother's place, a can opener or strainer, perhaps. My mama knows I come and help her out even though she pretends she doesn't.

55 Ama likes having me here. It's better than being at home. It's like being part of the world. Some days we go out and fish. Fishing has its lessons. It teaches me to be still. And holding still is not something that comes easy to me. I'm learning from Ama how to survive and 60 be friends with this land, and this is a place where a girl can get lost and the swamps and trees would eat her alive. It's a dangerous place with dark corners. On the days when Ama is silent, I learn from her stillness. It's not that she's moody. It's not an empty quiet, either, 65 the way it would be with some people. It's a full silence and I like sitting with it and it's a relief from the chattiness of my sister and mom. I can't say what I learn from it; there's no words for it. Words are such noisy things and silence is something you have to listen to 70 and when you do, it takes you by the hand, it catches hold of you. It tells you how to know things, like how sounds travel, where a certain bird is calling from.

But my feelings about Ama are mixed, I admit. Sometimes I love her, but there are times I don't even like her. I can't account for these feelings, but I think it has to do with how the world catches me up. It's when I've come from school I'm most likely to find her homely and strange. I see her through the eyes of other people and what they'd think of her. Through their eyes 80 she looks wild and crazy. Still, I always want to stay with her. Maybe it's because I am afraid of everything and she's afraid of nothing and I want to learn this from her. Foolish, my mama calls her fearlessness, and she says foolish people don't last too long around here. But

85 I think it's courage more than foolishness that Ama has, and besides, sometimes I feel a longing for the old ways she lives by. And that's why I come here. I feel called.

1. As they are described in the passage, which of the following pairs of characters most clearly symbolizes the conflict between the old and the new ways?
  - A. The narrator and her uncle Sonny
  - B. The narrator and her mother
  - C. Ama and the narrator
  - D. The narrator's mother and Ama
2. If the last paragraph were omitted from the passage, the reader would not know that:
  - F. some people view Ama's lifestyle with suspicion.
  - G. the narrator admits that she still has contradictory feelings about Ama.
  - H. the narrator's mother had asked her daughter to stop visiting Ama.
  - J. the narrator admires Ama for her self-reliance.
3. It can most reasonably be inferred from the passage that the narrator's mother is jealous of Ama because  
[www.amakab.com](http://www.amakab.com)
  - A. lives in accordance with her own beliefs, while the narrator's mother is conflicted about how she wants to live.
  - B. has a more comfortable house and a less physically taxing life in spite of following the old ways.
  - C. is much closer to the narrator, and more loved by the narrator, than is the narrator's own mother.
  - D. feels nothing but contempt for the narrator's mother, even though the narrator's mother admires her.
4. The passage states that the narrator is learning or trying to learn all of the following from Ama EXCEPT how to:
  - F. survive in a dark and dangerous land.
  - G. be still and listen to silence.
  - H. distinguish between heart and mind.
  - J. find courage and overcome fear.
5. The main purpose of the scene depicted in lines 20–34 is to:
  - A. point out that Ama did not trust anyone who came onto her land.
  - B. reveal the narrator's first impressions of Ama.
  - C. indicate that Ama was a fearless woman.
  - D. convey how intimidated the narrator's uncles were by Ama.
6. The sixth and seventh paragraphs (lines 34–47) are most likely told from the point of view of:
  - F. a woman immersed in the old ways imagining a meeting with her niece.
  - G. a young woman looking back from several years' distance at an event in her life.
  - H. a woman who is reflecting upon her first meeting with a young girl.
  - J. an old woman looking at an event that occurred in the recent past.
7. Which of the following best describes what the ninth paragraph (lines 55–72) reveals about Ama's character?
  - A. She understands and feels at home in the natural world.
  - B. She prefers the quiet of fishing to most other activities.
  - C. Even though her moods change frequently, she is rarely in a bad mood.
  - D. She hopes the narrator will begin to see her as a substitute mother.
8. In the context of the last paragraph, it can most reasonably be inferred that the narrator's mother calls Ama "foolish" (line 83) because Ama:
  - F. likes to visit with the narrator after school.
  - G. lives without any modern conveniences or appliances.
  - H. prefers fishing in silence to visiting with people.
  - J. lives without fear in a dangerous place.
9. The passage states that the narrator helps Ama by:
  - A. cutting wood for her.
  - B. catching fish for her.
  - C. bringing her supplies and kitchen items.
  - D. making small repairs on her house.
10. When the narrator uses the phrase "how the world catches me up" (line 76), she is most likely referring to how she:
  - F. is influenced by her everyday, contemporary life.
  - G. prefers Ama's way of life to her mother's way of life.
  - H. is often afraid of what is happening in the outside world.
  - J. doesn't understand her feelings for Ama.

## Passage II

**SOCIAL SCIENCE:** This passage is adapted from "Companies in a Family Way" by Amy Saltzman, which appeared in *U.S. News & World Report* (©1997 by U.S. News and World Report Inc.).

This is the paradox of the American workplace: Most companies now realize they must make concessions to a world where both parents work, and an increasing number offer flextime [flexible working hours], child care, and other programs to help employees cope. But the same companies expect their most ambitious and devoted workers to forgo such options or to take advantage of them only in order to spend more hours at the office. They adhere to a blueprint for success drafted 40 years ago when men went to work and women stayed home. In this conception, work is firmly in the center and "personal life" is squeezed into whatever space remains.

At a handful of companies, however, an experiment is underway that turns this formulation on its head. Rather than appending "family friendly" programs to a traditional conception of office life, these firms are redefining the nature of work itself, making balanced lives for employees a central tenet around which the rest of the company is designed.

Like most new philosophies, this one was born of necessity. Studies show workers want more balanced lives, and companies are wise to adapt if they want to stay competitive. Most corporations start out offering traditional job flexibility programs, but few employees take advantage of them. Child care would seem a good way to help workers handle family responsibilities, but in some cases it adds a new level of anxiety. With emergency child care available, for example, an employee can now come to work even when a child is too ill for day care, secure in the knowledge that a complete stranger is tending the toddler. "We had to ask ourselves if this is really the message we wanted to be sending employees—that work should come first no matter what," says Patricia Nazemetz, director of human resource policies and practices at a large technology company.

A more radical solution seems in order, and a few companies are finding it in a growing body of work by academics, psychologists, and management gurus. That work suggests that if businesses want to help people achieve balanced lives while helping firms profit, the answer is not to add more programs but to revamp fundamental notions about how people work.

Research supports the notion that the key to balancing work and family interests is a well-designed job, one where goals are clear and where workers have control over how, when, and where they get their work done. Underlying this is a recognition that employees have personal lives that sometimes get complicated. In a study conducted at a manufacturer of automotive products known for its family-friendly policies, researchers from the University of Chicago found that

workers whose jobs allowed them autonomy and input in decisions benefited most from the company's work and family programs. These employees reported that the policies not only helped them balance work and family demands but made them more committed to their jobs: They submitted twice as many quality improvement suggestions as workers who did not use work-family benefits. If a job was designed poorly, however, offering little autonomy or control, the benefits were of little help.

Not all jobs, of course, seem to invite such reform. Factory shift workers have little choice but to report to work at specific hours. As a result, they are rarely able to take advantage of programs designed to give employees more flexibility in their lives. But if the work itself is designed in a less-structured way, with both personal and business goals in mind, even shift workers benefit.

At one car manufacturing company, for example, an unusual four-day, 10-hour-a-day workweek, with rotating day and night shifts, offers workers more options while allowing the company to keep the plant operating six days a week, 20 hours a day, with minimal overtime. Workers get five consecutive days off at the end of each three-week rotation. Because they don't need to use leave time for appointments, these employees have fewer personal obligations that cut into productivity. And because teams are responsible for deciding how management's goals will be met, employees who need a day off can simply switch with another team member when personal problems do arise.

Few companies, of course, have the luxury of creating a new work culture from scratch, as that company did. But even well-established companies can learn from the innovative auto manufacturer: When such changes start at the top and are driven by business need, they are likely to succeed.

11. This passage is best described as being:

- an argument in support of making modern workplaces much more family friendly.
- an analysis of how traditional workplace models have served American businesses.
- a thorough evaluation of the drawbacks of making workplaces more family friendly.
- an examination of how workplaces have in the past abandoned job flexibility programs.

12. The author uses all of the following sources of evidence to support her assertions EXCEPT:
- F. the opinion of a human resources professional.
  - G. research by academics and psychologists.
  - H. examples of companies with family-friendly policies.
  - J. quotations from important management textbooks.
13. According to the passage, increased worker autonomy and input into decisions translates directly into an increase in worker:
- A. sharing in company profits.
  - B. commitment to the job.
  - C. hours at the workplace.
  - D. personal life complications.
14. The “paradox” mentioned in line 1 most directly refers to which of the following ideas?
- F. Most companies realize they must accommodate families in which both parents work outside the home, but few companies are actually offering programs intended to help workers cope.
  - G. Many companies offer ways to make the workplace more accommodating to families, but few employees are in fact interested in having more job flexibility.
  - H. Companies frequently offer options such as child care and flexible working hours, but many employees are opposed to these programs.
  - J. Many companies have job flexibility programs, but company expectations about how employees will use the programs limit the programs’ effectiveness.
15. Which of the following best describes the way the author uses the word *secure* in line 31?
- A. In a literal way that suggests workers are grateful to their companies when they provide emergency child care.
  - B. In a literal way that suggests employees feel comfortable that their children are being cared for in emergency day care.
  - C. In an ironic way that suggests a program that was intended to make workers feel better might have the opposite effect.
  - D. In a metaphorical way that suggests offering programs such as emergency child care helps workers feel more satisfied with their jobs.
16. It can reasonably be inferred that those conducting the research described in lines 50–63 were interested in studying all of the following EXCEPT the:
- F. types of products the workers produced.
  - G. level of workers’ satisfaction with their jobs.
  - H. connection between work and family.
  - J. amount of influence workers had over their jobs.
17. Which of the following best characterizes the work schedule described in the seventh paragraph (lines 72–84)?
- A. Employers benefit by the plant running longer hours, and employees benefit by getting more overtime pay.
  - B. Employers benefit more from increased productivity than the workers do from increased job flexibility.
  - C. Employers and employees both derive significant benefits from the schedule.
  - D. Employees gain substantial benefits from the schedule but at great expense to their company.
18. The “blueprint for success” mentioned in lines 9–10 most likely refers to the idea that:
- F. companies need to be flexible to accommodate workers.
  - G. companies must constantly reeducate their workers.
  - H. work and personal lives should be in balance.
  - J. work should come before one’s personal life.
19. In terms of its acceptance, the idea of reinventing the workplace is one that the passage indicates has been:
- A. tried out by a small number of companies.
  - B. adopted enthusiastically by the business community.
  - C. opposed by some academics and management experts.
  - D. proved to be effective in a large number of firms.
20. All of the following are identified in the fifth paragraph (lines 45–63) as critical to worker satisfaction EXCEPT:
- F. clear job expectations.
  - G. share of annual profits.
  - H. control over work schedule.
  - J. input in business decisions.

### Passage III

**HUMANITIES:** This passage is adapted from "When M.I.T. Artist Shouts, His 'Painting' Listens," an interview with Professor John Maeda conducted by Claudia Dreifus that appeared in the July 27, 1999, edition of *The New York Times* (©1999 by The New York Times).

Within the art world, Prof. John Maeda, 32, is an anomaly—a prize-winning graphic designer and kinetic artist with a fistful of engineering degrees from the Massachusetts Institute of Technology.

5 From his base in M.I.T.'s Media Laboratory, Professor Maeda uses the computer as a tool and medium to create art that can be produced only digitally and that has the specific look of the new technology. One of his best-known pieces is a drawing called "Time  
10 Paint," in which colors fly through space. Another piece, "The Reactive Square," is about squares that change shape when a viewer shouts at them.

Q. Your last book, *Design by Numbers*, is an art book that is also a manual for a new computer language that  
15 you invented to help artists understand the guts of computer design. Why create a whole new computer language?

A. One reason was that programming languages are made for people to write programs—big applications.  
20 For someone just starting out making art on their computers, they don't want this big truck of a system. They just want a simple bicycle that they understand. So I designed the visual equivalent of a simple bicycle. *Design by Numbers*, D.B.N., was an attempt to demystify the technology behind computer art, to show how simple it is, and that people can do it.

Q. When you are creating your own computer art pieces, do you ever use prepackaged drawing programs?

30 A. Oh, yes, all the time. There are all kinds of fine touches that prepackaged software makes easy. I could invent my own finishing system, but this is faster. Of course, the basic ideas, I create.

The problem is that most people can't just "finish"  
35 things with this software: They have to use it to start them, also. For much of recent history, people have created with brush, ink, paper—the materials of art. Now that they have begun creating with software and computers, the styles that emerge are homogeneous because  
40 the software is universal. Without being able to know how to program, you can't break out of the technology—just like if you don't know how to use brush and ink, you're limited.

For most people, this really isn't a problem; they  
45 aren't necessarily looking for anything new. But for people who are seeking the next step, the prepackaged becomes an impossible barrier to break free from.

I make everything I do. Many people are surprised that I don't have a programmer making things for me.  
50 And others are surprised that I don't have an artist controlling me, telling me how to program. Because today, people don't realize that it is possible to think and create on the computer. Artists are used to thinking that programming is very hard—impossible.

55 And technologists are used to thinking that they can never become artists. Me, I just make things. It's just a natural flow of action and thought. If people see, "Oh, he does that," then maybe they'll think, "I can do it too."

60 Q. But lots of nonartists use computers for creating images . . .

A. They are using it as a tool, but not as a material. And to use it as a tool, you need to understand the medium, which means understanding the technology.  
65 Young people are changing this, because they have grown up with computers.

Q. If a conventional artist produces an object on a computer, does that automatically make it art?

A. It's art, but it's just a painting and no different  
70 than conventional art.

It's not intrinsically different or superior just because it was created digitally and it's not digital art. Because digital art starts with an understanding and appreciation of the medium—which, unfortunately, is  
75 today programming.

Q. What did studying in Japan teach you?

A. The most important thing was to not be embarrassed about who I was. I had always been embarrassed about coming from a manual-labor family. In Japan, I  
80 was studying conventional art, and I used my hands all the time. That made me feel in touch with my human side, which I had lost when I came to M.I.T.

Q. Does the new technology mean the end of art as we know it?

85 A. Yes, it does. It represents a new dimension to the way art will be understood or perceived.

It's a departure from appreciating a singular moment. What that means is . . . the reason why we can appreciate art is because most art has a single resting  
90 point: canvas.

It's painted. It's dried. It aspires to be perfect. The medium of the computer is continually shifting. It can shift at will, in a microsecond. Or an hour. There's no limit on how it can be taught to change.

21. This passage is best described as an interview in which the person asking the questions:
- concentrates mainly on Maeda's personal life and history.
  - dwells on Maeda's writing and his new computer-programming language.
  - focuses on a series of topics related to Maeda's work and artistic philosophy.
  - examines how computer technology has negatively affected art.
22. Maeda most likely draws the comparison between big trucks and simple bicycles in lines 18–26 in order to:
- argue that a simpler programming language is more appropriate for computer-art novices, who might be overwhelmed by a traditional programming language.
  - suggest that today's big applications are too complex to create art with, and that people should instead use simpler art tools such as brushes and ink.
  - claim that a simple programming language such as Design by Numbers is the best tool available for both the beginning and the experienced computer artist.
  - point out the simplicity of Design by Numbers while noting its critical weaknesses relative to big, sophisticated programming languages.
23. When Maeda talks about the inability to "break out of the technology" (lines 41–42), he is most likely describing:
- the limitations placed upon traditional artists by the mere existence of the computer.
  - his nostalgia for traditional artistic tools such as brushes and ink.
  - his sense that people in general resent their inability to create entirely original computer art.
  - the constraints prepackaged drawing software imposes on artists' creativity.
24. In the passage, Maeda attributes his renewed connection to his "human side" (lines 81–82) to his:
- work at MIT.
  - digital art.
  - work of physically creating conventional art.
  - manual-labor family and background.
25. In the context of lines 83–94, the phrase *singular moment* (lines 87–88) most nearly means:
- a frozen, static image.
  - a unique period in art history.
  - an important time in Maeda's career.
  - the perfection aspired to by digital art.
26. The main purpose of the comparison in lines 87–94 is to:
- point out the limitless possibilities of digital art while criticizing its present state.
  - draw a contrast highlighting the feature of digital art that makes it so revolutionary as an art form.
  - contrast two forms of art and reveal the numerous strengths and weaknesses of each.
  - suggest that the fluid nature of digital art is what has made such art so unpopular in the art world.
27. Maeda claims that part of his agenda as an artist is to:
- set an example for others by showing how art and technology can be effectively blended.
  - convince more artists to abandon traditional art materials in favor of making art with prepackaged computer programs.
  - persuade people that Design by Numbers is the ideal tool for putting finishing touches on computer art.
  - try to demystify computer technology so that people realize that anyone can be a financially successful computer artist.
28. Based on the description in lines 5–12, Maeda's own art can accurately be characterized as:
- an even blend of digital and traditional art forms.
  - marked by an emphasis on movement and dynamic change.
  - having a new-technology look even when it was not created digitally.
  - notable for its use of color and its static restfulness.
29. According to the passage, Maeda finds that many people are surprised that he:
- comes from a manual-labor family.
  - once studied traditional art forms.
  - does both his own art and programming.
  - has written accessible books on digital art.
30. In the passage, Maeda makes the statement "Me, I just make things" (line 56) primarily to suggest that he:
- creates his art casually, without much thought or care.
  - feels comfortable mixing the worlds of art and technology in his work.
  - resents people's tendency to classify him as either a programmer or a technologist, but not both.
  - considers himself more of a builder or engineer than a true artist.

## Passage IV

**NATURAL SCIENCE:** This passage is adapted from the article "Zinc—The Immune System's Missing Link?" by Michael Janson, M.D., which appeared in *Health and Nutrition Breakthroughs* (©1997 by New Hope Communications).

To the general public, minerals are far less understood or valued than vitamins, though both are equally important to physiological functions. Among minerals themselves, calcium, magnesium and iron receive a disproportionate amount of attention, even though other minerals are equally necessary. Actually, all nutrients work in concert in our tissues to keep us healthy. One may well wonder, therefore, why some minerals are held in so much higher esteem than others. Well, calcium's popularity, for example, is due largely to advertising by the dairy industry to underscore the importance of milk, and iron is well known because its deficiencies are so easy to detect.

Mineral nutrients can be found in varying quantities in both our diets and our bodies. When they are present in our bodies in large amounts (measured in grams), they're called major minerals and include calcium, chlorine, magnesium, phosphorus, potassium, sodium and sulfur. Those that occur in smaller quantities (measured in milligrams or micrograms) are called trace minerals and include boron, chromium, cobalt, copper, iodine, iron, manganese, selenium, silicon and zinc. Deficiencies of either major or trace minerals can be as devastating to one's health as a lack of other better-known nutrients such as vitamins A, C, E and B complex.

Though zinc gets little attention, it is critical to a healthy body. Without it, more than 300 enzymes including trypsin and alcohol dehydrogenase cannot work properly, and physiological functions such as digestion and alcohol metabolism break down. The human body generally contains 1.4 g to 2.5 g of zinc. Much of this zinc is found in muscle and bone. It is also present in skin, hair and nails, as well as in the retina of the eye.

One of zinc's most essential roles is for the white blood cells of the immune system, where it helps the body fight off a range of viral infections—from strep and influenza to the common cold. Some white blood cells produce antibodies (humoral immunity), while others are phagocytes that attack and destroy invaders, thereby providing cellular immunity.

The thymus gland, located just under the sternum, controls some of our immune functions and is affected by the amount of zinc in the body. For instance, the thymus produces thymulin, a thymic peptide that is responsible for cell-mediated immunity. As we age, the thymus gland diminishes in function and size—from nearly the same size as the heart in infants to almost undetectable in elderly people. This happens in both humans and animals. Although long considered a normal process, it appears related to zinc nutritional status. A zinc supplement given to aging mice restored

the function of their thymus glands and led to the glands' regrowth. Researchers thus concluded that the usual involution of the thymus gland is not inevitable and can be reversed with zinc supplements.

Thymus-derived cells (T-cells) and natural killer cells likewise depend on zinc. Both T-cells and natural killer cells support a variety of immune-system functions such as destroying foreign cells, virally infected cells and cancer cells. An *in vitro* study showed that zinc increased the response of T-cells to all immune stimuli by 100 percent. The authors concluded that treatment with zinc may have immunotherapeutic relevance, particularly in the aged and stressed organism."

Zinc has been linked to the body's ability to resist viruses, especially respiratory infections. In a group of malnourished children, supplementation with zinc significantly reduced the incidence of cough, fever and respiratory secretions compared to placebo. However, after supplementation ceased, the symptoms returned to previous levels. In addition, two Italian doctors concluded that zinc deficiencies in elderly people may lead to depression of both hormonal and cellular immunity and a significant increase of susceptibility to infections.

Zinc deficiency is often the result of a poor diet—it is one of the hallmarks of malnourishment. Supplementing with zinc is quite safe—its only significant side effect is lowered copper levels in the body tissues, since the two minerals compete for absorption. Considering zinc's safety, people should consider taking zinc supplements, especially as they age—being sure to include copper in the proper balance. Most practitioners who supplement their patients' diets with zinc also recommend taking copper at a ratio of 10 mg to 15 mg zinc for each milligram of copper.

31. The author of the passage would most likely agree with which of the following statements?
  - A. Zinc is the most important of all the body's minerals.
  - B. Trace elements are less critical to humans than are major minerals.
  - C. Though often unappreciated by the public, zinc is as important to the body as calcium or iron.
  - D. All people, young and old, should take large doses of zinc as dietary supplements.

32. One of the main points of the second paragraph (lines 14–26) is that the:
- F. amount of a given mineral present in the body is not an indication of its importance.
  - G. amount of a given mineral present in the body is in direct proportion to its effect on health.
  - H. major minerals in the body occur in nearly the same amounts as trace minerals.
  - J. trace minerals in the body are very difficult for doctors to identify and measure.
33. The main point of the fourth paragraph (lines 36–42) is that:
- A. controlling the white blood cell count enhances cellular and humoral immunity.
  - B. zinc causes the body to fight off most phagocytes.
  - C. some white blood cells produce phagocytes and some do not.
  - D. zinc enables the body's white blood cells to better fight infection.
34. One of the main functions of the fifth paragraph (lines 43–57) is to:
- F. provide an explanation of why zinc is important to so many of the body's organs.
  - G. illustrate some of the ways in which one of the body's glands is affected by zinc.
  - H. show how unusual the thymus gland is compared to other of the body's glands.
  - J. describe how the thymus gland effectively increases the body's zinc level by producing thymulin.
35. The seventh paragraph (lines 67–76) establishes a cause-effect connection between:
- A. zinc levels and vulnerability to infection.
  - B. a person's age and his or her normal zinc levels.
  - C. malnourished children and improved health via placebo.
  - D. zinc supplements and depression in the elderly.
36. The main purpose of the last paragraph is to discuss the relationship between:
- F. low zinc levels and susceptibility to infection.
  - G. zinc's safety as a dietary supplement versus the risk of supplementing with copper.
  - H. safety and risk in dietary supplements in general.
  - J. the body's zinc and copper levels, and good health.
37. Which of the following statements does NOT accurately describe a trace mineral?
- A. A trace mineral is likely to be measured in milligrams or micrograms, rather than grams.
  - B. Because they occur in such small quantities, trace minerals are unable to affect a person's health.
  - C. Trace minerals include boron, copper, iodine, manganese, silicon, and zinc.
  - D. Even though they are present in small quantities, trace minerals are critical to a person's health.
38. The passage indicates that for infants, the thymus gland:
- F. serves a different purpose than it does for the elderly.
  - G. is proportionally much larger than it typically is in the elderly.
  - H. produces less thymulin than it usually does for the elderly.
  - J. is about the same size as it is in most animals.
39. Which of the following statements about zinc is accurate, according to information in the passage?
- A. Zinc occurs in the body in greater amounts than does boron.
  - B. Zinc causes the thymus gland to grow smaller over time.
  - C. Zinc enhances the effectiveness of T-cells.
  - D. Zinc supplements usually also contain copper.
40. As it is used in line 56, the word *involution* most nearly means:
- F. shrinking.
  - G. elimination.
  - H. improvement.
  - J. expansion.

**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 seven 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 1

Frog eggs develop into tadpoles, which then metamorphose into adult frogs. Recently, reported observations of frogs with morphological abnormalities (usually a missing or malformed hind limb) have increased in many localities. Four hypotheses attempt to explain this increase.

### Hypothesis 4

Tadpoles and frogs are prey for many aquatic predators, including fish, turtles, and wading birds such as herons. Predator attacks are not always completely successful; many result in injured frogs and tadpoles. Permanent injuries in tadpoles and frogs could later appear to be developmental abnormalities. Thus, increases in predator populations most likely account for the recent increase in morphological abnormalities.

### Hypothesis 1

Tadpoles are commonly parasitized by *trematodes*, flatworms that burrow into the tadpoles, causing cysts to form. The presence of cysts during tadpole development can cause morphological abnormalities in the adult frog. Thus, increases in trematode populations most likely account for the recent increase in morphological abnormalities.

### Hypothesis 2

Due to industrial pollution, Earth's ozone layer has thinned. This process has led to an increase in the amount of ultraviolet (UV) radiation reaching Earth's surface. UV radiation can directly cause abnormalities in frog eggs by producing mutations in the DNA that controls frog development. UV radiation can also indirectly cause abnormalities in frog eggs by chemically transforming certain pollutants into *teratogens*, chemicals that cause developmental abnormalities.

### Hypothesis 3

Certain pesticides contain a class of compounds called *retinoids*. Frogs naturally produce retinoids, but at high concentrations, retinoids cause mutations in frog eggs. These mutations later result in morphological abnormalities. Many of these mutations affect genes that control hind limb development. Thus, the recent increase in morphological abnormalities is probably due to an increase in retinoids from pesticides.

1. Which 2 hypotheses argue that the recent increase in morphological abnormalities in frogs is the result of human activities?

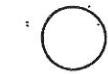
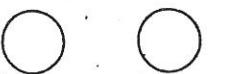
- A. Hypotheses 1 and 4
- B. Hypotheses 2 and 3
- C. Hypotheses 2 and 4
- D. Hypotheses 3 and 4

2. All 4 hypotheses propose that the factors causing morphological abnormalities in frogs are present in the:

- F. pesticides used by farmers.
- G. environment in which the frogs live.
- H. UV radiation produced by the Sun.
- J. bodies of the organisms that prey on frogs.

3. Which 2 hypotheses propose that direct contact between tadpoles and another organism results in morphological abnormalities in frogs?

- A. Hypotheses 1 and 4
- B. Hypotheses 2 and 3
- C. Hypotheses 2 and 4
- D. Hypotheses 3 and 4

**4****4**

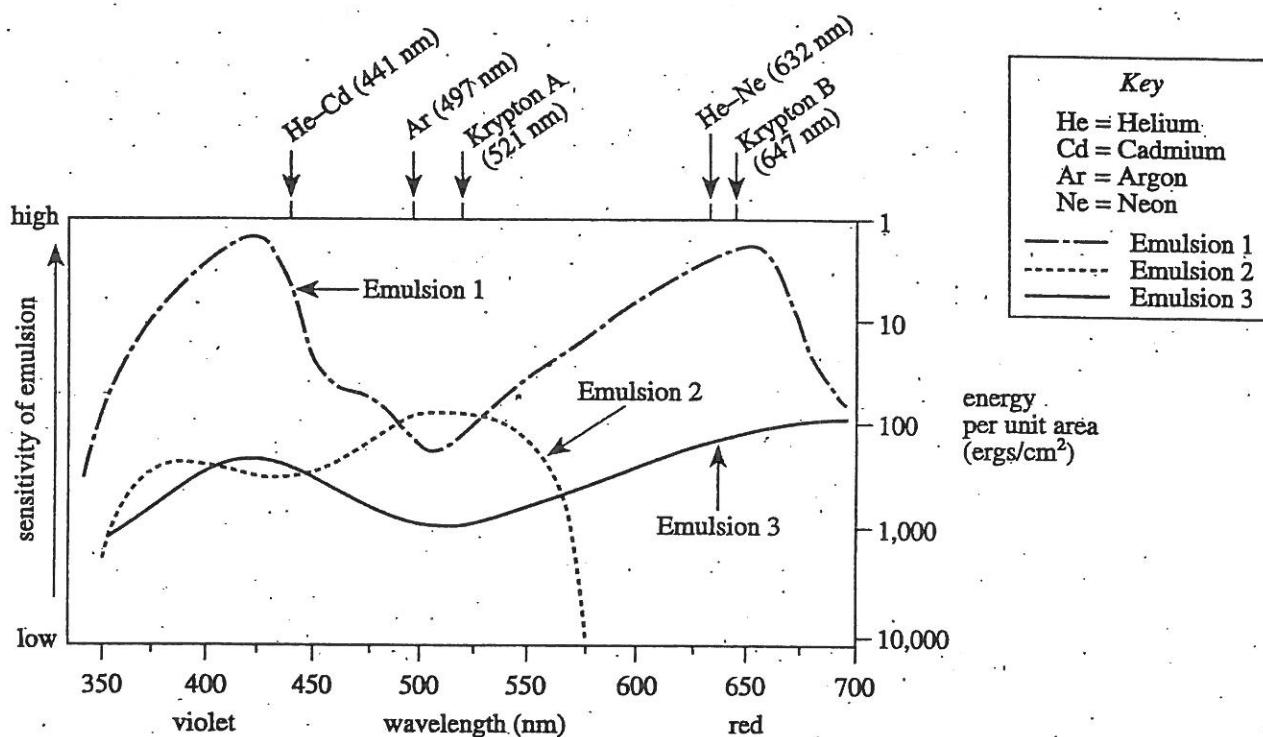
4. An artificial pond was created. The following were added to the pond: trematodes, UV-induced teratogens, retinoids, frog predators, tadpoles, and materials necessary for tadpole development. The frequency of morphological abnormalities in frogs was very high. This finding best supports which, if any, of the 4 hypotheses, and why?
- F. Hypothesis 1, since it shows that the morphological abnormalities are caused by parasitism by trematodes.
- G. Hypothesis 2, since it shows that the morphological abnormalities are the result of DNA mutations caused by teratogens.
- H. Hypothesis 3, since it shows that the morphological abnormalities are caused by the presence of retinoids.
- J. None of the 4 hypotheses is best supported, because the result does not indicate which factor caused the morphological abnormalities.
5. Normal adult frogs were captured, tagged, and released into a pond. After 2 months the frogs were recaptured and examined. Five percent of these frogs showed morphological abnormalities, such as missing hind limbs. These results best support which hypothesis?
- A. Hypothesis 1
- B. Hypothesis 2
- C. Hypothesis 3
- D. Hypothesis 4
6. Supporters of Hypothesis 4 would most likely argue that the frequency of morphological abnormalities in frogs would be *lowest* in which of the following types of aquatic communities?
- F. Those with fish, turtles, and wading birds
- G. Those with fish and turtles, but without wading birds
- H. Those with fish and wading birds, but without turtles
- J. Those without fish, turtles, and wading birds
7. A biologist has argued that some of the factors cited in both Hypothesis 1 and Hypothesis 2 are combining to cause the increase in the morphological abnormalities in frogs. Which of the following findings about trematodes, if true, would best support this view?
- A. Trematodes are highly sensitive to injury from UV light.
- B. Trematodes are immobilized by teratogens.
- C. Exposure to UV light increases trematode populations.
- D. Exposure to UV light improves frogs' resistance to trematode parasitism.



## Passage II

A *hologram* is a three-dimensional image produced when light from a laser shines on a film coated with a material called a *holographic emulsion*. The laser provides the light at a specific wavelength.

The figure below shows the light energy per unit area (in ergs/cm<sup>2</sup>) required to create a hologram on 3 different emulsions using gas lasers. For example, an Ar laser must produce 100 ergs/cm<sup>2</sup> to create a hologram on Emulsion 2. The figure also shows how the sensitivity to light of each emulsion and the light energy per unit area required to create a hologram on each emulsion vary with the wavelength of light used.



**4****4**

8. Based on the figure, as wavelength increases from 550 nm to 650 nm, the sensitivity of Emulsion 1:  
F. increases only.  
G. decreases only.  
H. remains constant.  
J. varies, but with no general trend.
9. Based on the figure, which of the following lasers produces a beam of light closest in color to red?  
A. He-Cd  
B. Ar  
C. Krypton A  
D. Krypton B
10. Based on the figure, which of the emulsions is/are more sensitive to light at 500 nm than to light at 425 nm?  
F. Emulsion 1 only  
G. Emulsion 2 only  
H. Emulsions 1 and 3 only  
J. Emulsions 2 and 3 only
11. A new laser produces most of its light at 575 nm. According to the figure, to produce a hologram on Emulsion 1, how much light energy per unit area will the new laser have to produce?  
A. Less than 10 ergs/cm<sup>2</sup>  
B. Between 10 ergs/cm<sup>2</sup> and 100 ergs/cm<sup>2</sup>  
C. Between 100 ergs/cm<sup>2</sup> and 1,000 ergs/cm<sup>2</sup>  
D. More than 1,000 ergs/cm<sup>2</sup>
12. A Krypton B laser will require less than 1,000 ergs/cm<sup>2</sup> to record a hologram on which emulsion(s)?  
F. Emulsion 1 only  
G. Emulsion 2 only  
H. Emulsions 1 and 3 only  
J. Emulsions 2 and 3 only



### Passage III

When a volatile liquid is in a closed container, the liquid at the surface is constantly evaporating (forming a vapor) and condensing (reforming a liquid). At equilibrium (when the rate of evaporation equals the rate of condensation) the pressure exerted by the vapor is called the *vapor pressure*, measured in millimeters of mercury (mm Hg). Students did the following experiments to study vapor pressures and boiling points.

### Experiment 1

A 5 mL sample of water was placed in a flask, then heated until it boiled. A 2-hole stopper containing temperature and pressure sensors was inserted into the flask. The temperature of the liquid and its vapor pressure were recorded by computer as the flask was cooled in an ice bath to 0°C. The procedure was repeated using ethanol and diethyl ether (see Figure 1).

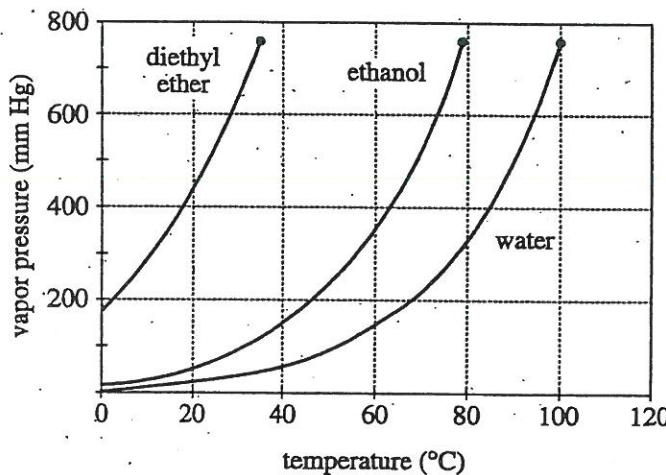


Figure 1

Figure adapted from Henry F. Holtzclaw, William R. Robinson, and William H. Nebergall, *College Chemistry With Qualitative Analysis*, 7th ed. ©1984 by D. C. Heath and Company.

### Experiment 2

A beaker containing 100 mL of water was heated at atmospheric pressure (760 mm Hg). After the water had boiled for 1 min, the temperature was recorded. The procedure was repeated using ethanol and diethyl ether (see Table 1).

Table 1

Liquid	Boiling point (°C)
Water	100.0
Ethanol	78.5
Diethyl ether	34.6

### Experiment 3

A 100 g sample of water was placed in a flask and 0.1 mole of a nonvolatile substance was dissolved in the water at room temperature (20°C). The vapor pressure was measured for this solution, and for solutions containing 0.2 mole and 0.3 mole of the substance. The procedure was repeated using ethanol and diethyl ether (see Table 2).

Table 2

Amount added (mole)	Vapor pressure (mm Hg) at 20°C for:		
	water	ethanol	diethyl ether
0	17.5	43.9	442.2
0.1	17.2	43.1	434.4
0.2	16.9	42.4	426.8
0.3	16.6	41.7	419.5

13. A student claimed that liquids with higher molecular masses boil at higher temperatures than liquids with lower molecular masses. Do the results of Experiment 2 and the information in the table below support his claim?

Liquid	Molecular mass (g/mole)
Water	18
Ethanol	46
Diethyl ether	74

- A. Yes; diethyl ether has the highest molecular mass and the highest boiling point.  
 B. No; diethyl ether has the highest molecular mass and the lowest boiling point.  
 C. Yes; water has the lowest molecular mass and the lowest boiling point.  
 D. No; water has the lowest molecular mass and the lowest boiling point.
14. Based on the results of Experiment 1, diethyl ether will have a vapor pressure of 100 mm Hg when it is at a temperature:  
 E. greater than 100°C.  
 G. between 50°C and 100°C.  
 H. between 0°C and 50°C.  
 J. less than 0°C.

15. Is the statement "If the amount of a nonvolatile substance dissolved in a liquid is increased, the vapor pressure will increase" supported by the results of Experiment 3?  
 A. No; as the amount of substance dissolved was increased in all 3 liquids, the vapor pressure for all 3 liquids stayed the same.  
 B. Yes; as the amount of substance dissolved was increased in all 3 liquids, the vapor pressure for 2 of the 3 liquids increased.  
 C. No; as the amount of substance dissolved was increased in all 3 liquids, the vapor pressure for all 3 liquids decreased.  
 D. Yes; as the amount of substance dissolved was increased in all 3 liquids, the vapor pressure for all 3 liquids increased.

4



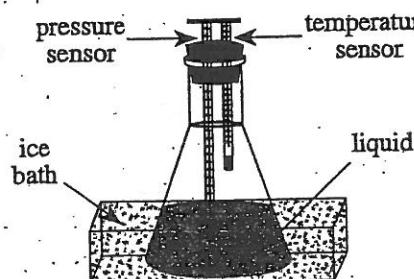
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16. Based on the results of Experiment 3, if 0.5 mole of the nonvolatile substance were dissolved in 100 g of diethyl ether, the vapor pressure, in mm Hg, of the solution would most likely be closest to:

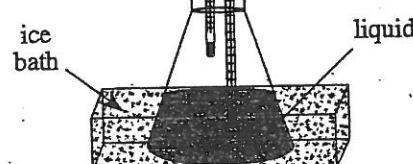
- F. 405.  
G. 415.  
H. 440.  
J. 455.

17. Which of the following best represents the apparatus that was being used as the computer recorded the results of Experiment 1?

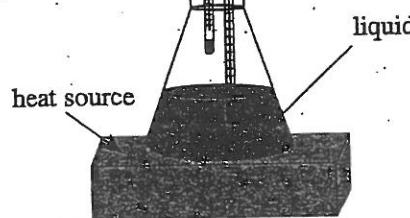
A. pressure sensor      temperature sensor



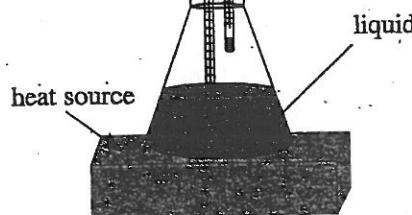
B. pressure sensor      temperature sensor



C. pressure sensor      temperature sensor



D. pressure sensor      temperature sensor



18. According to the results of Experiments 1 and 2, which of the following tables best shows the vapor pressures of the boiling liquids in Experiment 2?

F.	Water	100 mm Hg
	Ethanol	78 mm Hg
	Diethyl ether	35 mm Hg

G.	Water	35 mm Hg
	Ethanol	78 mm Hg
	Diethyl ether	100 mm Hg

H.	Water	100 mm Hg
	Ethanol	100 mm Hg
	Diethyl ether	100 mm Hg

J.	Water	760 mm Hg
	Ethanol	760 mm Hg
	Diethyl ether	760 mm Hg

### Passage IV

The Mediterranean Sea is home to many volcanic islands. Studying the volcanic ash that has settled on the islands and the ocean floor around the islands can tell scientists about the sequence of eruptions, the ash source, and the magma source, or sources, that feed the volcanoes.

#### Study 1

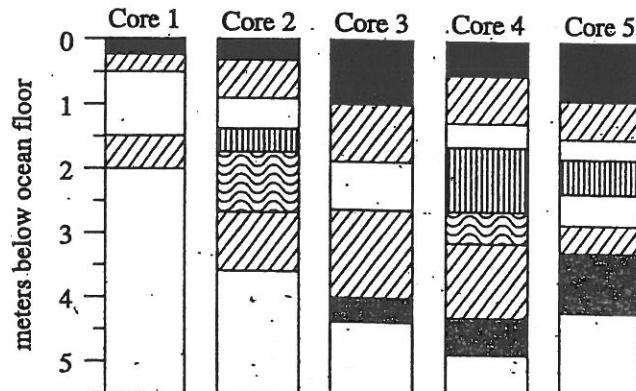
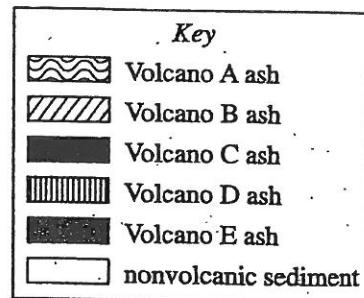
Scientists took 10 ash samples from a volcano on each of 5 islands. The samples were analyzed for their percent silica ( $\text{SiO}_2$ ) and potassium oxide ( $\text{K}_2\text{O}$ ) contents. Also measured were the zirconium (Zr), yttrium (Y), and rubidium (Rb) contents, in parts per million (ppm). The averaged sample analyses are shown in Table 1.

Table 1

Chemical component	Ash sample analysis from Volcano:				
	A	B	C	D	E
$\text{K}_2\text{O}$ (%)	3.3	3.3	3.0	7.0	6.2
$\text{SiO}_2$ (%)	68.2	68.9	68.4	60.2	60.2
Zr (ppm)	350	221	125	540	461
Y (ppm)	52	48	12	55	55
Rb (ppm)	118	118	84	412	392

#### Study 2

A 6 m long hollow tube was dropped to the ocean floor at 5 different sites around the volcanic islands to collect cores of undisturbed ocean floor sediments. Each core was sampled every 25 cm; and the samples were analyzed as in Study 1. Those analyses were compared to the results of Study 1 in order to identify the volcano that had produced a given ash layer present in the cores. The sediment and ash layers identified in each core are shown in Figure 1.



Note: The rate at which sediment was deposited was constant throughout the study area.

Figure 1

#### Study 3

To determine whether one or more magma sources feed volcanoes in the study area, scientists plotted the  $\text{SiO}_2$  content of ash samples from 8 of the volcanoes versus the respective  $\text{K}_2\text{O}$  content of those samples. The  $\text{SiO}_2$  and  $\text{K}_2\text{O}$  contents of the ash derived from a given magma source will fall within a narrow range of values. The 8 ash samples included samples from the 5 volcanoes in Study 1. The results are shown in Figure 2.

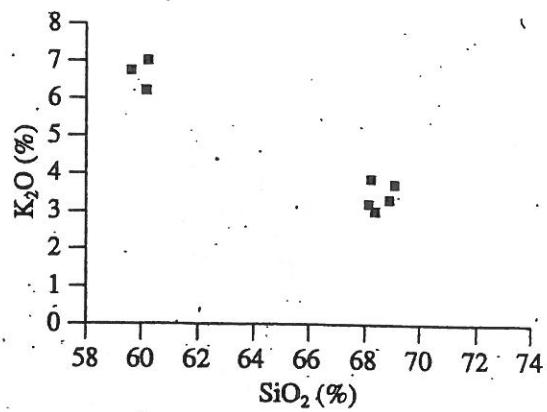


Figure 2

Table 1 and Figure 2 adapted from Darlene Richardson and Dragoslav Ninkovich, "Use of  $\text{K}_2\text{O}$ , Rb, Zr, and Y versus  $\text{SiO}_2$  in Volcanic Ash Layers of the Eastern Mediterranean to Trace Their Source." ©1976 by the Geological Society of America.

4



4

19. It is known that ocean floor sites closer to a given volcanic island usually have thicker layers of ash from the volcano on that island than sites farther away. Based on this information and Study 2, one would most likely conclude that which of the following cores was taken at the site closest to Volcano D?

- A. Core 1
- B. Core 2
- C. Core 3
- D. Core 4

20. According to Study 2, during the time it took to deposit the 5.5 m of sediment in the study area, the smallest amount of volcanic ash settled to the ocean floor at the site of:

- E. Core 1.
- F. Core 2.
- G. Core 3.
- H. Core 4.

21. Given that the 5 cores contained undisturbed sediment, according to Study 2, which of the following volcanoes erupted most recently?

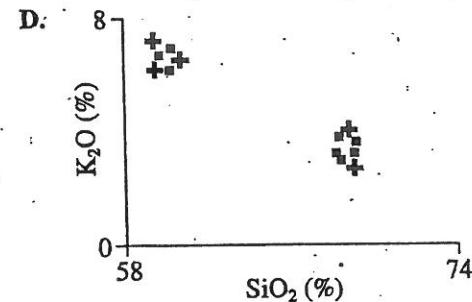
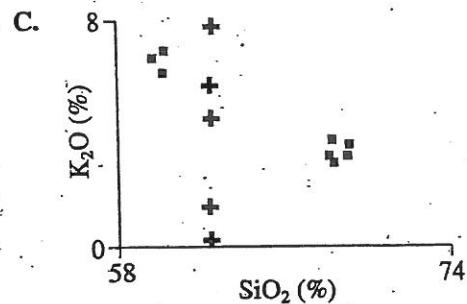
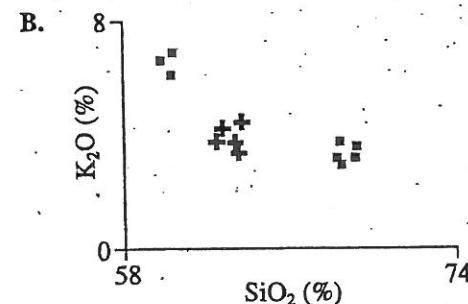
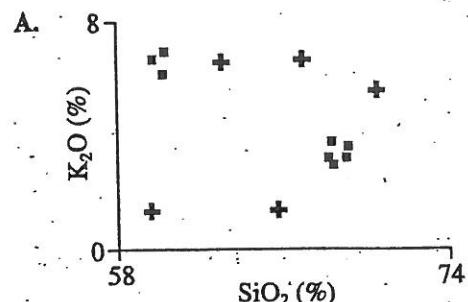
- A. Volcano A
- B. Volcano B
- C. Volcano C
- D. Volcano E

22. According to Study 1, as the content of Zr in ash samples from Volcanoes A, B, and C increases, the content of Y:

- E. increases, then decreases.
- F. decreases, then increases.
- G. increases.
- H. decreases.

23. If ash samples from volcanoes fed by a previously undiscovered magma source in the study area were analyzed, and their SiO<sub>2</sub> and K<sub>2</sub>O contents were also plotted on Figure 2, which of the following figures would most likely result?

(Note: The new ash sample contents are represented by the following symbol: +)



24. According to Study 1, what chemical component was found in the largest relative amount in the ash samples from Volcano A?

- E. SiO<sub>2</sub>
- F. Zr
- G. Y
- H. Rb

**Passage V**

Nutrients in seawater are removed by phytoplankton and other marine organisms. Figure 1 shows the concentrations of 3 nutrients—nitrate ( $\text{NO}_3^-$ ), dissolved inorganic phosphorus (DIP), and silicic acid ( $\text{H}_4\text{SiO}_4$ )—at various depths in the Atlantic, Pacific, and Indian Oceans. Figure 1 shows the average concentrations and the estimated *residence times* (how long an ion or molecule of a nutrient remains in the ocean) for the 3 nutrients in deep (> 3 km) Atlantic and Pacific waters. Figure 2 shows how the  $\text{NO}_3^-$  concentration in Pacific surface waters (< 0.3 km depth) varies with latitude.

**Table 1**

Nutrient	Average concentration in deep (> 3 km) ocean water ( $\mu\text{mol/L}$ )		Estimated residence time in ocean water (years)
	Atlantic	Pacific	
$\text{NO}_3^-$	20	35	57,000
DIP	1.8	2.8	69,000
$\text{H}_4\text{SiO}_4$	25	170	20,000

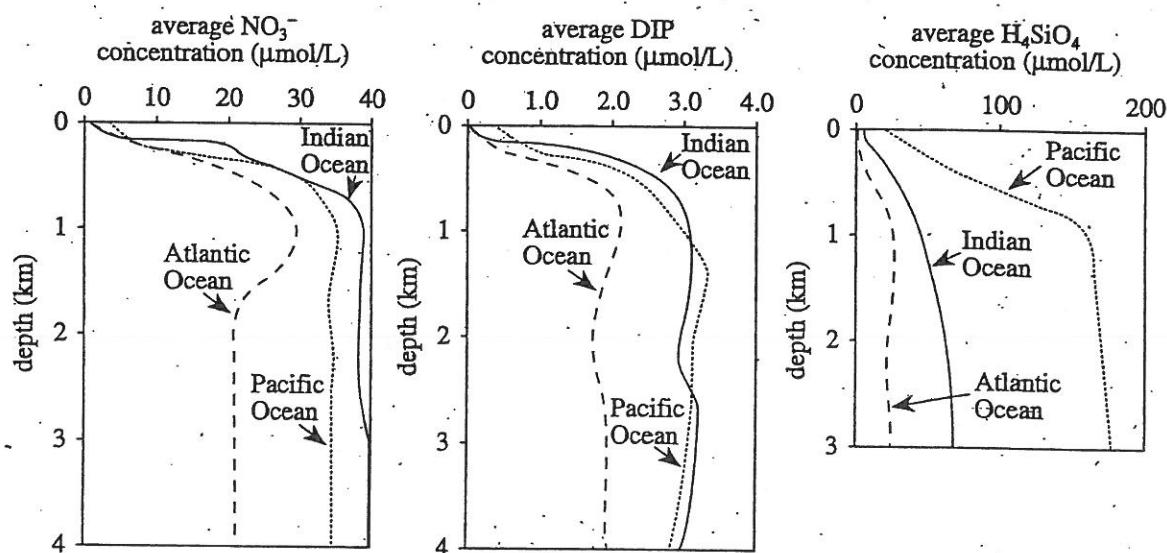

**Figure 1**

Figure 1 adapted from J. Andrews, P. Brimblecombe, T. Jickells, and P. Liss, *An Introduction to Environmental Chemistry*. ©1996 by Blackwell Science Ltd.

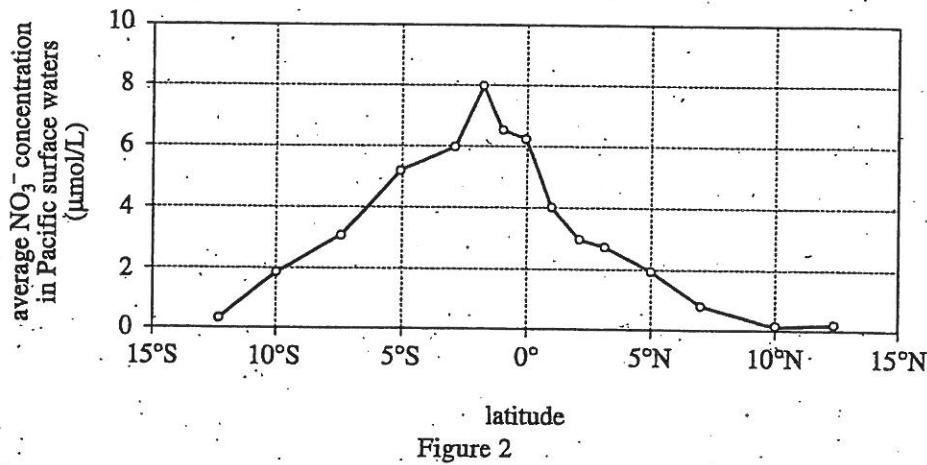

**Figure 2**

Figure 2 adapted from James Murray et al., "Physical and Biological Controls on Carbon Cycling in the Equatorial Pacific." ©1994 by the American Association for the Advancement of Science.

**4****4**

25. According to Figure 1, which of the following best describes the relationship between average  $H_4SiO_4$  concentration and depth in the Indian Ocean? As depth in the Indian Ocean increases from 0.5 km to 2.0 km, the average  $H_4SiO_4$  concentration:
- A. increases only.
  - B. increases, then decreases.
  - C. decreases only.
  - D. remains the same.
26. A scientist hypothesizes that the highest average  $NO_3^-$  concentration in Pacific surface waters would be found at the equator ( $0^\circ$  latitude). Is this hypothesis supported by the data in Figure 2?
- F. Yes; the average  $NO_3^-$  concentration at the equator is higher than that at any other given latitude.
  - G. Yes; the average  $NO_3^-$  concentration at the equator is lower than that at any other given latitude.
  - H. No; the highest average  $NO_3^-$  concentration is found a few degrees south of the equator.
  - J. No; the highest average  $NO_3^-$  concentration is found a few degrees north of the equator.
27. According to Table 1, an ion of  $NO_3^-$  would remain in the ocean, on average, approximately how many times longer than a molecule of  $H_4SiO_4$ ?
- A. 1.5 times
  - B. 2 times
  - C. 3 times
  - D. 3.5 times
28. According to Figure 1, the average DIP concentration is the same at which of the following depths in the Indian and the Pacific Oceans?
- F. 2.0 km
  - G. 2.5 km
  - H. 3.0 km
  - J. 3.5 km
29. Which of the following correctly ranks the concentrations of the 3 nutrients in the Indian Ocean at a depth of 3 km from largest to smallest?
- A.  $H_4SiO_4$ ,  $NO_3^-$ , DIP
  - B.  $H_4SiO_4$ , DIP,  $NO_3^-$
  - C. DIP,  $H_4SiO_4$ ,  $NO_3^-$
  - D.  $NO_3^-$ , DIP,  $H_4SiO_4$

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## Passage VI

The *total mechanical energy* (TME) of an object is defined as the sum of its *potential energy* (energy of position, abbreviated PE) and its *kinetic energy* (energy of motion, abbreviated KE). The object's PE =  $mgh$ , where  $m$  is its mass,  $h$  is its height above an arbitrary reference point, and  $g$  is the acceleration due to gravity ( $9.8 \text{ m/sec}^2$ ). The object's KE =  $mv^2/2$ , where  $v$  is its velocity.

When the object's motion changes but the sum KE + PE does not change, the TME is said to be *conserved*.

A group of students performed 2 experiments to investigate the conservation of TME.

## Experiment 2

The students performed an experiment in air at atmospheric pressure using the cart from Experiment 1 and the track shown in Figure 2; this track was NOT frictionless.

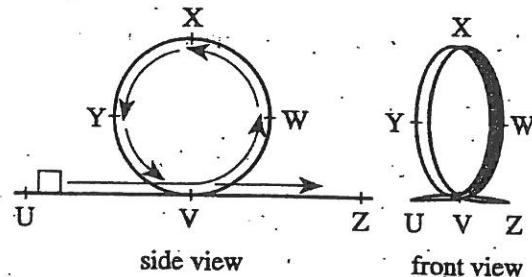


Figure 2

## Experiment 1

Starting from rest at Point P (see Figure 1), a 1 kg toy cart was released and allowed to move along a frictionless track in an airless vacuum chamber.

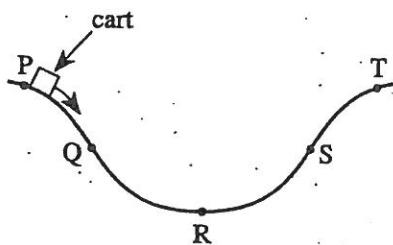


Figure 1

At various points along the track, the students determined both the cart's KE and PE in joules, J (see Table 1).

Table 1

Position	Height (m)	KE (J)	PE (J)
P	1.00	0.0	9.8
Q	0.50	4.9	4.9
R	0.00	9.8	0.0
S	0.50	4.9	4.9
T	1.00	0.0	9.8

30. In Experiment 2, suppose the students wanted to directly determine the difference, if any, in the cart's TME at Positions U and Z. Which of the following measurements should they have made?

- F. The height of Position X
- G. The heights of Positions U and Z
- H. The speed of the cart at Position X
- J. The speeds of the cart at Positions U and Z

4



4

31. The purpose for conducting Experiment 1 in a vacuum was to:

- A. increase the cart's potential energy at a given position.
- B. increase the frictional force exerted on the cart.
- C. decrease the cart's potential energy at a given position.
- D. decrease the frictional force exerted on the cart.

32. Suppose, in Experiment 1, instead of simply releasing the cart from Position P, the students had given the cart a push down the track. At Position T, compared to the cart's KE and TME when the cart was simply released, the cart's KE and TME when the cart was pushed would have been:

<u>KE</u>	<u>TME</u>
F. greater	smaller
G. smaller	greater
H. greater	greater
J. smaller	smaller

33. In Experiment 2, as the cart's speed decreased, air resistance decreased. At which of the following positions was air resistance most likely *lowest*?

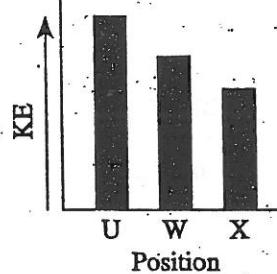
- A. Position U
- B. Position V
- C. Position W
- D. Position X

34. The results of Experiment 1 support the conclusion that as the cart's KE increased, its PE:

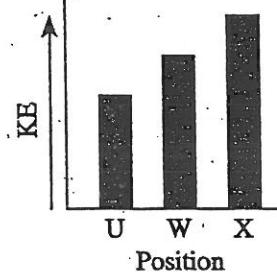
- F. always increased.
- G. always decreased.
- H. sometimes increased, and sometimes decreased.
- J. remained constant.

35. In Experiment 2, the KE of the cart at Positions U, W, and X would best be represented by which of the following bar graphs?

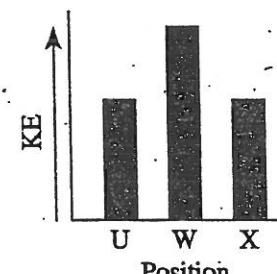
A.



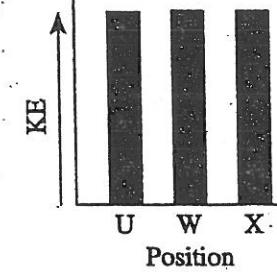
B.



C.



D.



**Passage VII**

A material's *thermal conductivity* is a measure of its ability to transport energy from one location to another. Tables 1 and 2 below list the thermal conductivities (in  $\frac{\mu\text{J}}{\text{sec} \cdot \text{cm} \cdot ^\circ\text{C}}$ ;  $\mu\text{J}$  = a unit of energy) of various gases at different temperatures (in  $^\circ\text{C}$ ). Table 3 below lists the masses, in atomic mass units (amu), of the atoms making up the molecules of the gases.

Table 1

Gas	Thermal conductivity ( $\frac{\mu\text{J}}{\text{sec} \cdot \text{cm} \cdot ^\circ\text{C}}$ ) at:				
	20°C	40°C	60°C	80°C	100°C
CH <sub>4</sub>	334	361	387	416	445
C <sub>2</sub> H <sub>6</sub>	204	228	257	288	316
C <sub>3</sub> H <sub>8</sub>	171	192	215	238	262
C <sub>4</sub> H <sub>10</sub>	154	174	193	213	233

Table 2

Gas	Thermal conductivity ( $\frac{\mu\text{J}}{\text{sec} \cdot \text{cm} \cdot ^\circ\text{C}}$ ) at:			
	40°C	60°C	80°C	100°C
CH <sub>3</sub> Cl	117	130	142	155
CH <sub>3</sub> Br	82	94	104	117
CH <sub>3</sub> I	60	68	75	82

Table 3

Atom	Atomic mass (amu)
H	1
C	12
Cl	35
Br	80
I	127

36. One of the gases listed in the tables has a thermal conductivity of  $182 \frac{\mu\text{J}}{\text{sec} \cdot \text{cm} \cdot ^\circ\text{C}}$  at  $30^\circ\text{C}$ . What is the identity of the gas?
- F. CH<sub>4</sub>  
 G. C<sub>2</sub>H<sub>6</sub>  
 H. C<sub>3</sub>H<sub>8</sub>  
 J. CH<sub>3</sub>Cl
37. Suppose that identical warm objects, each at  $50^\circ\text{C}$ , are immersed in equal volumes of each of the gases listed in Table 1. Assuming that the gases are initially at  $20^\circ\text{C}$  and the same pressure, which of the gases will conduct the greatest amount of heat away from the object immersed in it in a given amount of time?
- A. CH<sub>4</sub>  
 B. C<sub>2</sub>H<sub>6</sub>  
 C. C<sub>3</sub>H<sub>8</sub>  
 D. C<sub>4</sub>H<sub>10</sub>
38. Consider the gases carbon dioxide (CO<sub>2</sub>) and carbon monoxide (CO). Based on Table 1, at a given temperature, which of these gases will have the higher thermal conductivity, and why?
- F. CO<sub>2</sub>, because it has the lower molecular mass.  
 G. CO<sub>2</sub>, because it has the higher molecular mass.  
 H. CO, because it has the lower molecular mass.  
 J. CO, because it has the higher molecular mass.
39. Consider only the data for C<sub>4</sub>H<sub>10</sub> and CH<sub>3</sub>Cl. These data are *inconsistent* with which of the following hypotheses about thermal conductivity?
- A. For C<sub>4</sub>H<sub>10</sub>, as the temperature increases, the thermal conductivity increases.  
 B. For CH<sub>3</sub>Cl, as the temperature increases, the thermal conductivity increases.  
 C. At a given temperature, as molecular mass increases, the thermal conductivity increases only.  
 D. At a given temperature, as molecular mass increases, the thermal conductivity decreases only.
40. A particular gas, CH<sub>3</sub>X, has a thermal conductivity of  $177 \frac{\mu\text{J}}{\text{sec} \cdot \text{cm} \cdot ^\circ\text{C}}$  at  $100^\circ\text{C}$ . Based on the data in Tables 2 and 3, the mass of X is:
- F. less than the mass of Cl.  
 G. greater than the mass of Cl and less than the mass of Br.  
 H. greater than the mass of Br and less than the mass of I.  
 J. greater than the mass of I.

**END OF TEST 4**

**STOP! DO NOT RETURN TO ANY OTHER TEST.**

## ACT Writing Test Prompt

At some high schools, teachers have considered allowing each student to choose the books he or she will read for English class rather than requiring all students in class to read the same books. Some teachers support such a policy because they think students will greatly improve their reading skills if they read books they find interesting. Other teachers do not support such a policy because they think that students will learn more by participating in class discussion with others who have read the same books. In your opinion, should each individual student be allowed to choose the books he or she reads for English class?

In your essay, take a position on this question. You may write about either one of the two points of view given, or you may present a different point of view on this question. Use specific reasons and examples to support your position.

### Note

- Your test booklet will have blank space for you to plan your essay. For this practice test, use scratch paper.
- You may wish to remove pages 33–36 to respond to this prompt.
- When you have completed your essay, read pages 22 and 25–29 for information and instructions on scoring your practice Writing Test.

Form 0961F (2009)  
Parking Feud

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

## ACT Resource Links

**ACT Online Practice Tests:** <https://www.crackab.com/act/>

※ ACT English Practice Tests:

<https://www.crackab.com/act/english/>

※ ACT Math Practice Tests:

<https://www.crackab.com/act/math/>

※ ACT Reading Practice Tests:

<https://www.crackab.com/act/reading/>

※ ACT Science Practice Tests:

<https://www.crackab.com/act/science/>

**ACT Grammar:** <https://www.crackab.com/act/grammar/>

**ACT Real Past Papers Download:**

<https://www.crackab.com/act-downloads/>

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**Digital SAT & New SAT Practice Tests:**

<https://www.cracksat.net>

**Real SAT Tests Download:**

<http://www.cracksat.net/sat-downloads/>

**AP Exams Practice Tests:**

<https://www.crackap.com>

<https://www.apstudy.net>

**TABLE 1**  
**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 0961F	Your Scale Score
English	_____
Mathematics	_____
Reading	_____
Science	_____
<b>Sum of scores</b>	_____
<b>Composite score (sum + 4)</b>	_____

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	Raw Scores				Scale Score
	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science	
36	75	59-60	40	40	36
35	74	57-58	39	39	35
34	72-73	56	37-38	—	34
33	71	55	36	38	33
32	70	53-54	35	37	32
31	69	52	34	—	31
30	68	50-51	33	36	30
29	66-67	48-49	32	35	29
28	64-65	46-47	31	34	28
27	63	44-45	29-30	33	27
26	61-62	41-43	28	32	26
25	58-60	39-40	27	30-31	25
24	56-57	37-38	26	29	24
23	54-55	35-36	24-25	27-28	23
22	52-53	33-34	23	25-26	22
21	49-51	32	22	23-24	21
20	46-48	30-31	20-21	21-22	20
19	44-45	28-29	19	19-20	19
18	41-43	25-27	18	17-18	18
17	39-40	22-24	17	15-16	17
16	36-38	18-21	16	13-14	16
15	33-35	15-17	14-15	12	15
14	30-32	12-14	13	11	14
13	28-29	10-11	11-12	10	13
12	26-27	08-09	09-10	09	12
11	24-25	06-07	08	07-08	11
10	23	05	07	06	10
9	21-22	04	06	05	9
8	18-20	—	05	04	8
7	14-17	03	04	03	7
6	11-13	—	—	—	6
5	09-10	02	03	02	5
4	07-08	—	02	—	4
3	05-06	01	—	01	3
2	03-04	—	01	—	2
1	00-02	00	00	00	1