ACT Practice Examination

The next sections contain tests in English, Mathematics, Reading, and Science Reasoning. ***CALCULATORS MAY BE USED ON THE MATHEMATICS TESTS ONLY.***

The questions in each test are numbered and the suggested answers for each question are lettered. For each question, first decide which answer is best. Then, circle the letter corresponding to your choice. Mark only one answer to each question.

You may work on each test ONLY when the person supervising this test 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.

ENGLISH TEST

45 Minutes—75 Questions

DIRECTIONS: In the five passages below, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for each underlined part. 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." 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, circle the alternative you consider best.

PASSAGE I

Running a Marathon

[1]

Running a marathon is not for the <u>faint of heart</u>[1] <u>tremendous effort</u> is involved in simply planning the training. This is the first test of the fortitude of the would-be marathoner. If the challenges of the <u>planning stage is</u>[2] surpassed, the likelihood of completing the marathon increases tenfold. The following are factors to consider in preparing for a <u>marathon: making</u>[3] a schedule, acquiring running gear, and changing personal habits. If these tasks are done well, then the marathon is more apt to be a safe, positive experience.

[2]

The first task is to devise a systematic, rigorous training <u>schedule, prior to training, runners</u>[4] should be averaging at least 20 miles per week. Official training takes about 12 weeks. <u>In contrast to</u>[5] the 20 mile base, a runner would add mileage at a rate of four miles per week. By weeks 10 and 11, the total should be 60 miles

1. A. NO CHANGE
   B. faint of heart. Tremendous effort
   C. faint of heart: tremendous effort
   D. faint of heart, tremendous effort

2. F. NO CHANGE
   G. planning stage was
   H. planning stage, is
   J. planning stage are

3. A. NO CHANGE
   B. marathon. Making
   C. marathon; making
   D. marathon, making

4. F. NO CHANGE
   G. schedule; Prior to training, runners
   H. schedule. Prior to training, runners
   J. schedule. Prior to training runners

5. A. NO CHANGE
   B. However,
   C. In addition to
   D. Thus,

GO ON TO THE NEXT PAGE

per week. In week 12, there should be a slight tapering of mileage to allow the body to build energy reserves. 6

[3]

The next task is to acquire proper gear. Essentials include a watch; shoes designed for high-mileage training, 7 and appropriate clothing. A good watch will have a stopwatch feature that allows for recording split-times. Shoes should be very well cushioned and high in shock absorption. Marathon runners in Mexico need special shoes for practice runs on mountains. 8 Clothes should be comfortable, and should include special gear for wet and cold weather training.

[4]

The third task involves making changes in personal habits. More and more sleep 9 than usual will be required. The body will burn more than the customary calories, so additional carbohydrates and proteins should be consumed. Hydrating the body well prior to runs and replenishing fluids during and after runs will be essential. Alcohol and caffeine, which act as diuretics, should be avoided. Its consumption 10 will only make training more difficult.

6. If the writer wanted to strengthen the ideas presented in this paragraph, which of the following pieces of information could be appropriately added to this paragraph?

- **F.** More detail on how much to reduce training in week 12.
- **G.** Suggestions for proper clothing to be worn.
- **H.** Changes in personal habits that need to undertaken.
- **J.** Procedures to handle injuries while training for a marathon.

7.
- **A.** NO CHANGE
- **B.** watch, shoes designed for high-mileage training,
- **C.** watch, shoes designed for high-mileage training
- **D.** watch shoes designed for high-mileage training

8.
- **F.** NO CHANGE
- **G.** Marathon runners, in Mexico, need special shoes for practice runs on mountains.
- **H.** Marathon runners in Mexico need special shoes for practice's runs on mountains.
- **J.** OMIT the underlined portion.

9.
- **A.** NO CHANGE
- **B.** More and extra sleep
- **C.** More sleep
- **D.** Most sleep

10.
- **F.** NO CHANGE
- **G.** Their consumption
- **H.** It's consumption
- **J.** They're consumption

GO ON TO THE NEXT PAGE

[5]

The tasks above serve to set the ground for an injury-free and <u>emotional</u> satisfying training experience. (11)
Runners who shortchange the tasks of the planning stage are more likely <u>to quit. When the training</u> (12) becomes arduous. Those who perform these tasks <u>well</u> (13) already exhibit the qualities of discipline, motivation, and tenacity that define the marathoner.

11. **A.** NO CHANGE
B. emotional,
C. emotional—
D. emotionally

12. **F.** NO CHANGE
G. to quit when the training
H. to quit; when the training
J. to quit—when the training

13. **A.** NO CHANGE
B. good
C. well and thoroughly
D. well and good

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

14. Suppose the writer wanted to insert the following material into the essay:

"Midway through training, runners should schedule a day a week to run at least ten miles."

The new material best supports, and therefore should most logically be placed in, Paragraph:
F. 1
G. 2
H. 3
J. 4

15. Suppose the writer were assigned to write an essay that describes her personal experiences while running her first marathon. Does this essay fulfill this assignment?

A. Yes, because the writer describes steps necessary to prepare for a marathon.
B. Yes, because the writer warns of injuries that could occur while training.
C. No, because writers should always use the first person pronoun "I" in essays.
D. No, because the writer did not focus on running the marathon.

GO ON TO THE NEXT PAGE

PASSAGE II

Talented Individuals

Benjamin Bloom has spent a lifetime trying to understand what produces talented adults. He and his associates have studied individuals who have already received acclaim in one of six areas, Olympic (16) swimming, world class tennis playing, concert piano playing, sculpting, researching mathematics, and researching neurology.

After years of gathering and analyzing data. (17) Bloom and his associates concluded that "The study has provided strong evidence that no matter what the initial characteristics (or gifts) of the individuals, unless there is a long and intensive process of encouragement, nurturance, and education and (18) training, the individuals will not attain extreme levels of capability in these particular fields."

Nevertheless, Bloom (19) also concluded that parents played a crucial role in helping their children develop their talents. For example, most parents were well (20) educated: 70 percent of the fathers had advanced college degrees and 55 percent of the mothers had at least one college degree. More importantly, education and achievement were highly valued by the parents, at the same time, many parents (21) did not try to specifically direct the interests of their children.

Although (22) the parents did not try to push too

16. F. NO CHANGE
G. one of six areas; Olympic
H. one of six areas—Olympic
J. one of six areas Olympic

17. A. NO CHANGE
B. analyzing data, Bloom
C. analyzing data Bloom
D. analyzing data; Bloom

18. F. NO CHANGE
G. and education, and training
H. and education, and training,
J. education, and training,

19. A. NO CHANGE
B. In contrast, Bloom
C. Despite this, Bloom
D. Bloom

20. F. NO CHANGE
G. good
H. too
J. OMIT the underlined passage

21. A. NO CHANGE
B. parents. At the same time, many parents
C. parents: At the same time, many parents
D. parents at the same time, many parents

22. F. NO CHANGE
G. Nevertheless,
H. But
J. OMIT the underlined passage

GO ON TO THE NEXT PAGE

hard in a specific direction, children (23) did encourage the traits of working hard, doing well, and being precise. In many cases, the parents provided the role model for what it meant to work hard. Most of the talented individuals, at an early age, were curiously (24) and more adventuresome (25) than their less talented peers. These signs of creativity were often nurtured, with parents encouraging and trying to respond to his child's (26) questions. "I've always had this urge to figure out anything that I didn't know," one talented adult woman said about her (27) childhood.

Parents would encourage this actively (28) inquisitiveness by playing games with their children. At a young age, children would be encouraged by both parents and some teachers to pursue answers on their own, and to figure things out themselves. These characteristics were used by children throughout their school years and into their adult life.

23.
- **A.** NO CHANGE
- **B.** direction, their
- **C.** direction, their children
- **D.** direction, they

24.
- **F.** NO CHANGE
- **G.** were
- **H.** were curious
- **J.** were more curious

25.
- **A.** NO CHANGE
- **B.** more adventuresomely
- **C.** most adventuresome
- **D.** OMIT the underlined passage

26.
- **F.** NO CHANGE
- **G.** their children's
- **H.** their child
- **J.** his children's

27.
- **A.** NO CHANGE
- **B.** his
- **C.** its
- **D.** their

28.
- **F.** NO CHANGE
- **G.** (place before *would*)
- **H.** (place after *games*)
- **J.** (place after *children*)

Questions 29 and 30 ask about the preceding passage as a whole.

29. Which of the following topics, if placed in the next paragraph, would most logically continue this discussion?
- **A.** Examples of how teachers encouraged the talented individuals
- **B.** A survey of the parents' childhood years.
- **C.** A summary of another of Bloom's books
- **D.** The rules of some games played by children

30. Which of the following best expresses the author's tone in this passage?
- **F.** condescending
- **G.** critical
- **H.** impartial
- **J.** humorous

GO ON TO THE NEXT PAGE

PASSAGE III

Teaching Psychology

[1]

For a long time, it was difficult for me to teach an Introductory Psychology course. It wasn't that the material was particularly dry. On the contrary, my grab bag of teaching tricks included Pavlovian or Skinnerian conditioned dogs, pigeons, and monkeys; Gestalt perceptual illusions; split-brain complexities; and abnormal behaviors. Nor was it that students were more than uninterested.[31] The problem usually arose after the lecture was finished. Invariably, some bright attentive student[32] would remained after[33] class, wait until everyone had left, and finally comment, "The lecture was interesting, Professor. But, you see, I've got this problem, and I was wondering how this material would help me."

[2]

The students and the problems were different on[34] different days, but the accumulated toll of contradictions forced me to question what I was doing was I[35] teaching anything that meant something to anyone other than professional psychologists? Did psychology have anything to say about the lives of individual people? Was psychology addressing problems that the average student would ask?

31. **A.** NO CHANGE
B. more uninterested.
C. uninterested and indifferent.
D. uninterested.

32. **F.** NO CHANGE
G. bright, attentive student
H. bright, attentive, student
J. OMIT the underline passage

33. **A.** NO CHANGE
B. have remained after
C. remaining after
D. remain after

34. **F.** NO CHANGE
G. are different on
H. were different from
J. differ

35. **A.** NO CHANGE
B. I was doing? Was I
C. I was doing. Was I
D. I was doing; Was I

GO ON TO THE NEXT PAGE

[3]

Seeking help with these questions, introductory psychology textbooks were examined[36]. However, after inspecting the typical approaches to teaching psychology, as evidenced in several major textbooks, I concluded that it's answer[37] to all three questions would have to be "No." I decided to write a letter to the[38] American Psychological Association.

[4]

For instance, an[39] examination of the indices of several bestselling textbooks reveals scant references to any of the following topics; anger[40], crying, envy, happiness/unhappiness, loneliness, the future, jealousy, loving, or working. Behaviorists are probably screaming that these are hardly proper psychological concepts; behaviorists, however, must consider proper human concerns. Even[41] if they reframe them in behavioral terms. Most textbooks, however, completely ignore these topics.[42]

36.
- **F.** NO CHANGE
- **G.** introductory psychology textbooks are examined
- **H.** I examined introductory psychology textbooks
- **J.** I examine introductory psychology textbooks

37.
- **A.** NO CHANGE
- **B.** its answer
- **C.** its answers
- **D.** the answer

38.
- **F.** NO CHANGE
- **G.** Therefore, I decided to write a letter to the American Psychological Association.
- **H.** I wrote a letter to the American Psychological Association.
- **J.** OMIT the underlined passage.

39.
- **A.** NO CHANGE
- **B.** In contrast, an
- **C.** In addition, an
- **D.** However, an

40.
- **F.** NO CHANGE
- **G.** topics: anger
- **H.** topics. Anger
- **J.** topics anger

41.
- **A.** NO CHANGE
- **B.** human concerns, though even
- **C.** human concerns even
- **D.** human concerns. Thus even

42. The author wishes to strengthen the ideas in this paragraph. Which of the following topics could appropriately be added to this paragraph?
- **F.** References to other important topics that textbooks omit.
- **G.** A discussion of common topics that textbooks include.
- **H.** A description of humanistic psychology.
- **J.** An explanation of how behaviorists deal with anger.

GO ON TO THE NEXT PAGE

[5]

So, what is psychology <u>to be? and, as</u> a teacher,
43
what am I to teach that is fulfilling to me and my students? After all, I am not teaching a mathematics or physics class where the content doesn't pretend to address human concerns. But psychology's primary concern is with human beings, and, as such, am I not compelled to discuss the issues <u>that more relating</u> to
44
human existence?

43. **A.** NO CHANGE
B. to be? As
C. to be: and, as
D. to be. And, as

44. **F.** NO CHANGE
G. that relating
H. that relate
J. relate

Question 45 asks about the preceding passage as a whole.

45. Suppose the author wanted to add the following sentence to this passage:

In fact, I had won several teaching awards.

The sentence would most logically be inserted into Paragraph:

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

GO ON TO THE NEXT PAGE

PASSAGE IV

Searching for Bill Gates

[1]

On a recent trip, the Internet World trade show was attended, a gathering of representatives from technology and computer companies, most of whom were promoting products and services related to the Internet and the World Wide Web. I spent most of my time on the trade show floors. Ostensibly, I wanted to learn more about the growth and impact of the World Wide Web on both business and education; secretly, I just wanted to talk in a long conversation to Bill Gates.

[2]

The most prevalent contemporary symbols of the present age have to be William H. Gates III and the World Wide Web. Already distinguished by a nickname. The "Web" is being promoted as the force that will allow anyone, anytime, anywhere to access information or communicate with anyone about nearly anything. At least, this image is what most of the companies were attempting to portray. Mr. Gates's own company Microsoft, is the most optimistic. Microsoft's ubiquitous advertising slogan, "Where Do You Want to Go Today?," suggests a sanguine omnipotence at the fingertips of every child.

[3]

Mr. Gates's distinction lies not only in being currently the richest man in the world but also in running the largest computer software company in the

46.
- **F.** NO CHANGE
- **G.** the Internet World trade show was attended
- **H.** I attended the Internet World trade show
- **J.** I attended the Internet World trade show,

47.
- **A.** NO CHANGE
- **B.** talk
- **C.** to talk
- **D.** to talk in a conversation

48.
- **F.** NO CHANGE
- **G.** nickname, The "Web"
- **H.** nickname, the "Web"
- **J.** nickname the "Web"

49.
- **A.** NO CHANGE
- **B.** However, this
- **C.** At least this
- **D.** In contrast, this

50.
- **F.** NO CHANGE
- **G.** company Microsoft
- **H.** company—Microsoft
- **J.** company, Microsoft,

GO ON TO THE NEXT PAGE

world. "Bill" is different because he's also seen as one of the smartest men on the planet. [51] Various biographies and media accounts reveal that his associates and employees use various computer metaphors to describe his intelligence: "high bandwidth," "lots of RAM," and "parallel processing to the max," for example. Bill's acumen frequently finds fault with his employees and associates; he is noted for shouting at nearly everyone "That's the stupidest thing I've ever heard."

[4]

Bill has a penchant for collecting innovative ideas and smart, intelligent people. At the trade show, the enormous Microsoft exhibit was divided into various stations, each displaying software ranging from word processing and database design to a host of new products related to the Web. At each stand, a Microsoft employee would display, with amazing alacrity, the revolutionary new features of a particular product, he implied that the buyer would also be able to perform complex functions instantly upon purchase. I downloaded the beta version of one of the newer products later; furthermore, I didn't have a chance to demonstrate my skill with the product because I couldn't manage to install the program. At that point I could almost hear a collective shout of disdain reverberating in my mind from Bill's ensemble of talent.

51. The answer to which of the following questions would strengthen the ideas presented to this point in this paragraph?

- **A.** Why the author switched from using Mr. Gates to "Bill"?
- **B.** Why the "Web" is so popular?
- **C.** How much money Mr. Gates has accumulated?
- **D.** How many other large computer companies exit?

52.
- **F.** NO CHANGE
- **G.** associates; He is
- **H.** associates: He is
- **J.** associates he

53.
- **A.** NO CHANGE
- **B.** smart people
- **C.** smart intelligent people
- **D.** people who are intelligent and smart

54.
- **F.** NO CHANGE
- **G.** he implied that he
- **H.** implying that the buyer
- **J.** implying

55.
- **A.** NO CHANGE
- **B.** however, I
- **C.** in addition, I
- **D.** however,

GO ON TO THE NEXT PAGE

[5]

I never met Bill Gates. I'm not that
56
disappointed. Perhaps my real

talent would have resided in something
57

besides computers. 58

56.
- **F.** NO CHANGE
- **G.** I never met Bill Gates: I'm not that disappointed.
- **H.** I never met Bill Gates, I'm not that disappointed.
- **J.** I never met Bill Gates—I'm not that disappointed.

57.
- **A.** NO CHANGE
- **B.** had been resided
- **C.** has resided
- **D.** resides

58. To strengthen this paragraph, the writer could most appropriately add which of the following:
- **F.** A discussion of the author's computers.
- **G.** A description of the typical Microsoft employee.
- **H.** An explanation of why the author is not disappointed.
- **J.** An outline of Bill Gates's new house.

Questions 59 and 60 ask about the preceding passage as a whole.

59. Suppose the author wanted to insert the following sentence:

In addition to Microsoft, other companies are promoting the "Web" as a powerful marketing force.

This sentence would most appropriately be inserted into Paragraph:
- **A.** 1
- **B.** 2
- **C.** 3
- **D.** 4

60. Is the use of the first person pronoun "I" appropriate in this essay?

- **F.** Yes, because the writer is describing personal experiences.
- **G.** Yes, because all travel narratives are described in the first person.
- **H.** No, because the use of the first person is inappropriate in descriptive essays.
- **J.** No, because the essay describes a past experience.

GO ON TO THE NEXT PAGE

PASSAGE V

Sport Headlines

[1]

Reading a newspaper is often like walking through a linguistic bazaar: multi-sized headlines, like so many barkers, cry out for attention, while a list of newly named products are paraded (61) from advertisement to advertisement. In their headlines and advertisements, newspapers have often employed (62) language in unusual and novel ways.

[2]

Consider the Sunday sports section of a major American newspaper. Usually (63) one of the largest stalls in the bazaar. During a typical fall football season, teams will win or lose each week the newspaper (64) will report the scores and provide a short account of each game. But rarely in these headlines do sports editors merely list the scores or report which teams won, which teams lost, and which tied. In addition, we (65) encounter stories with headlines such as "Cougars Drown Beavers," "Longhorns Stampede Mustangs," "Air Force Torpedoes the Navy," and so forth. Teams have been "battered," "bumped," "hammered," "bombed," "demolished," and so on, with the list of verbs seemingly different each week.

[3]

Winning verbs can be drawn from the domain of destruction: (66) *blast*, *cream*, *crush*, *destroy*, *pulverize*, and *smash*. Or if a win occurs by a small margin, different

61. **A.** NO CHANGE
B. products is paraded
C. products, is paraded
D. products, are paraded

62. **F.** NO CHANGE
G. had often employed
H. has often employed
J. often employ

63. **A.** NO CHANGE
B. newspaper: usually
C. newspaper, usually
D. newspaper—usually

64. **F.** NO CHANGE
G. each week, however the newspaper
H. each week however the newspaper
J. each week, and the newspaper

65. **A.** NO CHANGE
B. Instead, we
C. Furthermore, we
D. We

66. **F.** NO CHANGE
G. destruction, *blast*
H. destruction; *blast*
J. destruction *blast*

GO ON TO THE NEXT PAGE

verbs can be used: *elude*, *hold off*, *repel*, and *shade.*
67

With multiple possibilities for expressing how one team loses to another: *beaten*, *blown out by*, *bow to*, *gets kick from*, *pulverized by*, *upset by*, *wrecked by*.

[4]

Many of the verbs are drawn from domains that symbolize certain characteristics of our society. For example, from the Wild West, we have *corral*, *lasso*,
68

stampede, *gallop by*; from the military, *bomb*, *submarine*, *torpedo*, *gun down*; from animals *butt*, *claw*, *maul*, *mangle*.
69

[5]

Headline writers for sports sections are actively involved in playing with language and characterizing game results in creative ways, often for the amusement of their readers. Football players are known to read these sports sections with interest.
70

In the process, writers

67. **A.** NO CHANGE
B. and shade, with
C. and shade. There are
D. shade, with

68. **F.** NO CHANGE
G. For example,
H. For example from
J. Instead of

69. **A.** NO CHANGE
B. and from animals, butt, claw, maul, mangle
C. from animals: butt, claw, maul mangle
D. from animals, butt; claw, maul, mangle

70. **F.** NO CHANGE
G. Football players read these sports sections with interest.
H. These sections are read with interest by football players.
J. OMIT the underlined passage.

GO ON TO THE NEXT PAGE

can come to exert an influence on language

itself, as they produce a temporary change in meaning
71
for many common verbs. 72

71.
- **A.** NO CHANGE
- **B.** itself, as it
- **C.** itself, as we
- **D.** OMIT the underlined passage.

72. Which of the following additions would help the writer strengthen the ideas in the last paragraph?
- **F.** Discussing other sports players who read newspapers.
- **G.** Listing other verbs that describe winning and losing.
- **H.** Explaining how a temporary change in meaning for verbs occurs.
- **J.** Describing other newspaper activities that amuse readers.

Questions 73, 74, and 75 ask about the preceding passage as a whole.

73. Suppose the writer were assigned the task of writing about the impact of newspaper articles on the public's perceptions of athletes in sports. Does this essay fulfill this purpose?

- **A.** Yes, because it describes the impact that newspaper headlines have.
- **B.** Yes, because the last paragraph describes football players.
- **C.** No, because the writer only considered one sport.
- **D.** No, because the article is about headlines and not athletes.

74. Suppose the writer wanted to insert the following sentence:

For example, once a verb like maul has been used to describe winning it expands its original meaning, in essence temporarily changing its definition.

This sentence would most appropriately be inserted in Paragraph:

- **F.** 2
- **G.** 3
- **H.** 4
- **J.** 5

75. What is the main idea of this passage?

- **A.** Many verbs can be used to describe winning and losing.
- **B.** Newspaper articles are meant to amuse readers.
- **C.** Headline writers are unusual people.
- **D.** Only newspapers use verbs in unusual ways.

END OF ENGLISH TEST.

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

MATHEMATICS TEST

60 Minutes—60 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and circle the letter corresponding to the correct answer. 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. Simplify $4\frac{2}{3} + 2\frac{1}{4} - 1\frac{2}{9}$.
   - **A.** 4
   - **B** $5\frac{25}{36}$
   - **C.** $7\frac{1}{2}$
   - **D.** $8\frac{1}{9}$
   - **E.** $8\frac{5}{36}$

2. Simplify $\dfrac{2 - \frac{5}{12}}{1 + \frac{5}{6}}$.
   - **F.** $\frac{19}{22}$
   - **G.** $\frac{21}{22}$
   - **H.** $\frac{29}{22}$
   - **J.** $\frac{30}{78}$
   - **K.** $\frac{209}{78}$

3. A person's bowling average is 160. She would like to raise her average by 15% during the next six months. What is her new average?
   - **A.** 24
   - **B** 136
   - **C.** 176
   - **D.** 184
   - **E.** 240

4. At a particular store, all books are discounted 20% off the regular price. If the store also adds a 7% sales tax to the purchase price, how much does a customer pay for a $25.50 regular priced book (rounded to the nearest cent)?
   - **F.** $5.10
   - **G.** $20.40
   - **H.** $21.83
   - **J.** $25.50
   - **K.** $27.79

GO ON TO THE NEXT PAGE

DO YOUR FIGURING HERE.

5. Susan worked an average of 35 hours per week in one month. If Susan worked 32, 43, and 37 hours, respectively, in each of the first three weeks of the month, how many hours did she work the fourth week?
   - **A.** 25
   - **B** 28
   - **C.** 30
   - **D.** 31
   - **E.** 32

6. The 150 members of one church averaged $100 in donations for a particular month. The 100 members of another church averaged $150 in donations for this same month What was the combined average for both churches?
   - **F.** $110
   - **G.** $115
   - **H.** $120
   - **J.** $125
   - **K.** $130

7. An IQ score is calculated by dividing Mental Age (MA) by Chronological Age (CA) and multiplying this result by 100. This relation is expressed by which of the following formulas?
   - **A.** IQ = (MA/CA) x 100
   - **B.** IQ = (CA/MA) x 100
   - **C.** IQ = CA / (MA x 100)
   - **D.** IQ = MA / (CA x 100)
   - **E.** IQ = (MA/CA) + 100

8. John purchased a sandwich for q quarters and a bag of potato chips for 30 cents. He paid for this purchase with d dollars. How much change did he receive, in cents (c), as expressed in terms of d and q?
   - **F.** d - q - 30
   - **G.** 100d - 25q -30
   - **H.** d - 25q -30
   - **J.** d - q
   - **K.** d - 30

9. For all x and all P, $(2x^2 - Px + 10) - (x^2 + 5) = ?$
   - **A.** $-Px + 5$
   - **B.** $-Px + 15$
   - **C.** $x^2 - Px + 5$
   - **D.** $x^2 - Px + 15$
   - **E.** $2x^2 - Px + 5$

GO ON TO THE NEXT PAGE

DO YOUR FIGURING HERE.

10. For all x, $(x - 5)^2 - (x - 3)^2 = ?$

F. 16
G. $-4x + 16$
H. $-16x + 34$
J. $2x^2 - 16x + 34$
K. $2x^2 - 4x + 16$

11. Which of the following is the complete factorization of $10c^3d - 20c^2d^2 - 30cd^3$?

A. $5(2c^3d - 4c^2d^2 - 6cd^3)$
B. $5(2c^2 - 6cd)(cd + d^2)$
C. $10cd(c - 3d)(c + 3d)$
D. $10cd(c - 6d)(c - d)$
E. $10cd(c - 3d)(c + d)$

12. What are the values of x for which $\frac{x + 5}{x(x - 2)(x + 5)}$ is undefined?

F. 0 only
G. 0 and 2 only
H. 0 and -5 only
J. 2 and -5 only
K. 0, 2, and -5 only

13. If $\frac{17}{20} - \frac{1}{4} = x - 2\frac{2}{5}$, then x = ?

A. 1.3
B. 1.8
C. 2
D. 3
E. 3.5

14. If $\frac{x}{3} + \frac{x}{4} = 2x - 3$, then x = ?

F. $\frac{-36}{17}$
G. $\frac{-3}{5}$
H. $\frac{-1}{3}$
J. $\frac{1}{3}$
K. $\frac{36}{17}$

15. $3\sqrt{80} + 5\sqrt{125} = ?$

A. $8\sqrt{205}$
B. $10\sqrt{5}$
C. $37\sqrt{5}$
D. $49\sqrt{5}$
E. $173\sqrt{5}$

16. $(\sqrt{5} - \sqrt{3})(\sqrt{3} - \sqrt{5}) = ?$

F. 2
G. $2\sqrt{15}$
H. $2\sqrt{15} + 2$
J. $2\sqrt{15} - 8$
K. $2\sqrt{15} + 8$

GO ON TO THE NEXT PAGE

DO YOUR FIGURING HERE.

17. $(2^3 \times 2^5)^2 (3^4 \times 3^2)^3 = ?$

A. $2^{10}\ 3^9$
B. $2^{16}\ 3^{18}$
C. $2^{30}\ 3^{24}$
D. 6^{19}
E. 6^{34}

18. Which of the following is equivalent to $\dfrac{(2.5 \times 10^3)\ (1.2 \times 10^5)}{.3 \times 10^{11}}$?

F. .0001
G. .001
H. .01
J. .1
K. 1

19. Let $d = at^2$ be the formula for the distance an object falls, where d represents distance traveled in feet; a, acceleration of an object (feet/sec^2); and t, time elapsed in seconds. If the acceleration is 32 feet/sec^2 and the time elapsed is one minute, what is the distance fallen in feet?

A. 1
B. 112
C. 1190
D. 115,200
E. 3,686,400

20. What is the value of the expression $\dfrac{a^3\ b^2 - ab}{b^2 - a}$

when a = -2 and b =3?

F. -11.14
G. -9.43
H. -7.09
J. -6
K. 6

21. $|\ 2 - (10 - 3 - 2)| = ?$

A. -13
B. -3
C. 3
D. 7
E. 13

22. Which of the following contains the solution(s) to the equation below?

$|\ y - 3| = 10$

F. 0
G. 1
H. (2, 3)
J. (-13, 7)
K. (13, -7)

GO ON TO THE NEXT PAGE

DO YOUR FIGURING HERE.

23. Which of the following represents the solutions for the following inequality?

$-2 (x + 2) \geq 4$

A. $x \leq -4$
B. $x \leq 0$
C. $x \geq 0$
D. $x \geq -4$
E. $x \geq 8$

24. What are the real values of x that satisfy the following inequality? $(x + 4) \geq - x (x + 1)$

F. All real x
G. No real x
H. $x \geq -2$
J. $-2 \leq x \leq 2$
K. $x \geq 2$ or $x \leq -2$

25. $(-5)^2 + 5^{-2} + 5^0 = ?$

A. 0
B. $25 \frac{1}{25}$
C. $26 \frac{1}{25}$
D. 50
E. 51

26. $27^{-2/3} = ?$

F. 9
G. $\frac{1}{9}$
H. $-\frac{1}{9}$
J. - 9
K. - 78

27. $\frac{1}{\sqrt{5}} - 1 = ?$

A. $\frac{\sqrt{5} - 5}{5}$
B. $-\sqrt{5} + 1$
C. $-\sqrt{5} - 1$
D. $\sqrt{5} + 1$
E. $\sqrt{5} + \frac{1}{4}$

28. For all real $x > 0$ and $y > 0$, the radical expression $\frac{\sqrt{x} + \sqrt{y}}{\sqrt{x} - \sqrt{y}}$ is equivalent to which of the following?

F. 0
G. x - y
H. $\frac{x + 2\sqrt{xy} + y}{x - y}$
J. $\frac{x + 2\sqrt{xy} + y}{x + y}$
K. $\frac{x^2 + y^2}{x - y}$

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DO YOUR FIGURING HERE.

29. In slope-intercept form, what is the equation of the line that passes through the points L (3, 4) and M (15, 8) in the standard (x, y) coordinate plane?

A. $y = 3x - 3$
B. $y = 3x + 3$
C. $y = 3x$
D. $y = \frac{1}{3}x - 3$
E. $y = \frac{1}{3}x + 3$

30. What are the slope and y-intercept of the equation $7x - 4y + 16 = 0$?

F. $\frac{7}{4}$ and 4
G. $-\frac{7}{4}$ and -4
H. 7 and 4
J. 7 and 16
K. -7 and -16

31. Points C and D in the standard (x, y) plane have coordinates (4, 1) and (-3, -1), respectively. What are the (x, y) coordinates of the midpoint of CD?

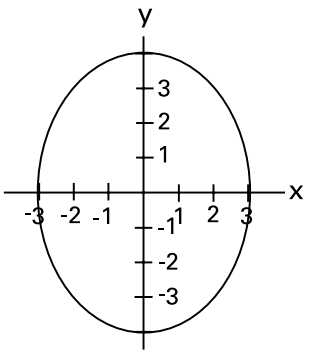
A. $(\frac{1}{2}, 0)$
B. $(\frac{7}{2}, 0)$
C. $(\frac{1}{2}, 1)$
D. $(\frac{7}{2}, 1)$
E. (7, 1)

32. Point A has coordinates (-1, -3) and Point B has coordinates (-1, 7) in the standard (x, y) plane. What is the distance between these two points?

F. 0
G. 4
H. 7
J. 9
K. 10

33. The ellipse in the standard (x,y) coordinate plane below has its center at the origin. Which of the following is an equation of the ellipse?

A. $\frac{x^2}{3} + \frac{y^2}{4} = 1$
B. $\frac{x^2}{9} + \frac{y^2}{16} = 1$
C. $\frac{x^2}{6} + \frac{y^2}{8} = 1$
D. $\frac{x^2}{\sqrt{3}} + \frac{y^2}{\sqrt{4}} = 1$
E. $\frac{x^2}{3} + \frac{y^2}{\sqrt{8}} = 1$



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34. The circle $(x - 1)^2 + (y - 1)^2 = 17$ intersects the y-axis in two points, one of which is $(0, 5)$. At what other point does the circle intersect the y-axis?

F. $(0, -5)$
G. $(0, -3)$
H. $(0, 3)$
J. $(0, 17)$
K. $(5, 0)$

35. For all real x and n, if $(x - 2)(x + k) = x^2 + nx - 2k$, then $n = ?$

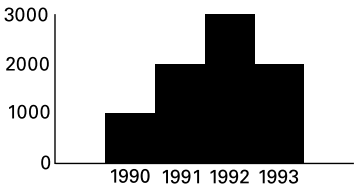
A. 0
B. 1
C. k
D. $k + 2$
E. $k - 2$

36. For all $x \cdot 0$ and $x \cdot 2$, $\dfrac{1 - \frac{4}{x^2}}{1 - \frac{2}{x}} = ?$

F. $\frac{2}{x}$
G. $\frac{x}{x-2}$
H. $\frac{x}{x+2}$
J. $\frac{x+2}{x}$
K. $\frac{x-2}{x}$

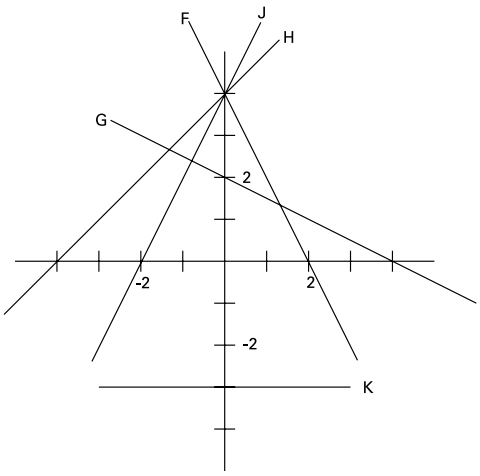
37. Based on the graph below, what was the percent increase in the sale of automobiles from 1991 to 1992?

A. $33\frac{1}{3}\%$
B. 50%
C. $67\frac{2}{3}\%$
D. $133\frac{1}{3}\%$
E. 150%



38. Which of the following is a graph of the relation $4x + 2y = 8$ in the standard (x, y) coordinate plane?

F. F
G. G
H. H
J. J
K. K



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DO YOUR FIGURING HERE.

39. Three siblings are to share an inheritance from a grandparent in the ratio 2:3:4, from youngest to oldest, respectively. The total amount of the inheritance is $45,000. How much will the oldest sibling receive?

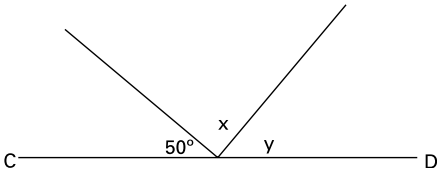
A. $5,000
B. $15,000
C. $20,000
D. $22,000
E. $22,500

40. A rope is to be divided into three segments with lengths x + 2, x + 4, and x + 6. The total length of the rope is 24 feet. How long, in feet, is the shortest segment?

F. 4
G. 6
H. 8
J. 10
K. 12

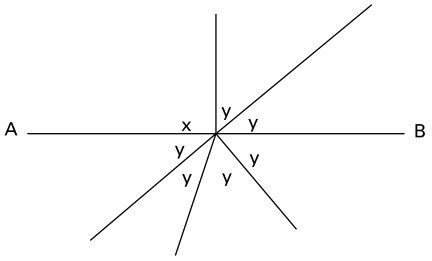
41. In the figure below, if CD is a line, the sum of x + y is equal to which of the following?

A. 50
B. 120
C. 130
D. 210
E. 310



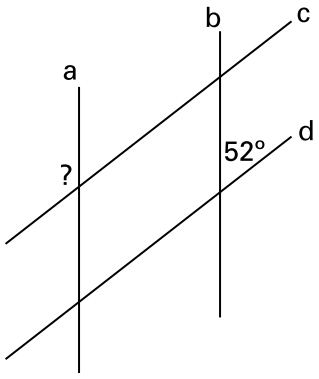
42. In the figure below, if AB is a line, what is the value of x?

F. 45
G. 60
H. 75
J. 90
K. 120



43. In the figure below, lines a and b are parallel, as are lines c and d. What is the measure of the indicated angle?

A. 52
B. 128
C. 130
D. 132
E. 302



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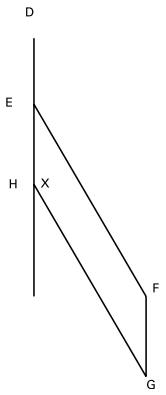
DO YOUR FIGURING HERE.

44. In the figure below, angle DEF measures 120°. EF is parallel to GH. What is the measure of angle x?

F. 60
G. 90
H. 110
J. 115
K. 120

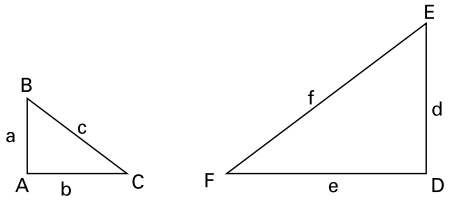


45. If the area of a triangle is 24 square units and its base is 4 units long, how many units long is the altitude to that base?

A. 4
B. 5
C. 6
D. 12
E. 18

46. The figures below show 2 triangles, where triangle ABC is similar to triangle DEF. In these similar triangles, a = 15, b = 20, c = 25, and d = 30. In these triangles, angle A is similar to angle D and angle B is similar to angle E. What is the value of e?

F. 30
G. 40
H. 50
J. 60
K. 70



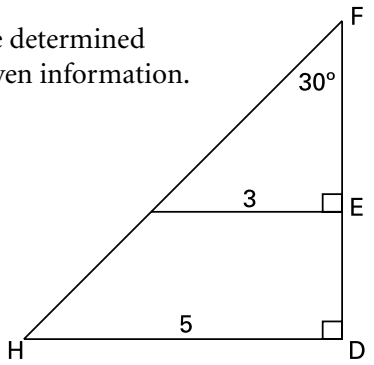
47. If the hypotenuse of a right triangle is 13 inches long and one of its legs is 5 inches long, what is the length, in inches, of the other leg?

A. 8
B. 9
C. 10
D. 12
E. $\sqrt{194}$

GO ON TO THE NEXT PAGE

48. Based on the information in the figure below, how many inches long is DE?

F. 2
G. $2\sqrt{3}$
H. $3\sqrt{3}$
J. $5\sqrt{3}$
K. It cannot be determined from the given information.



49. The perimeter of a rectangle is equal to 60. In this rectangle, the length is twice the width. What is the length of this rectangle?

A. $\sqrt{30}$
B. 10
C. $2\sqrt{30}$
D. 20
E. 40

50. What is the area, in square feet, of the rectangle whose length is $(3\sqrt{2} + 2)$ feet and whose width is $(3\sqrt{2} - 2)$ feet?

F. $14 - 6\sqrt{2}$
G. 14
H. $12\sqrt{2}$
J. $14 + 6\sqrt{2}$
K. 36

51. A circle has a diameter of 10 inches. What is the circle's area, in square inches?

A. 25
B. 10π
C. 20π
D. 25π
E. 100π

52. Katie wants to run around a circular track at the gym. The diameter of this circular track is 50 feet. If she wants to run a mile (1 mile = 5280 feet), approximately how many times around this circular track must she run?

F. 34
G. 68
H. 106
J. 157
K. 210

DO YOUR FIGURING HERE.

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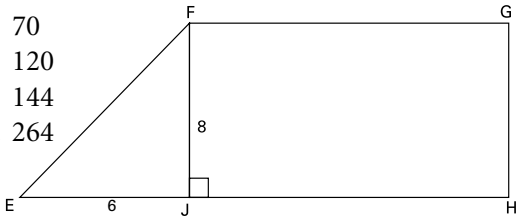
DO YOUR FIGURING HERE.

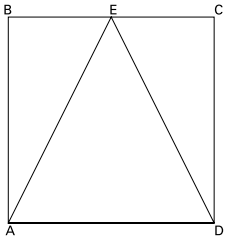
53. In the figure below, rectangle FGHJ has a perimeter of 46 inches. What is the area of EFGH, in square inches?

A. 24
B. 70
C. 120
D. 144
E. 264



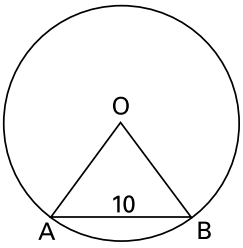
54. In the figure below, square ABCD has an area of 144 square inches. Point E is on line BC. What is the area of triangle AED, in square inches?

F. 36
G. 72
H. 110
J. 144
K. 324



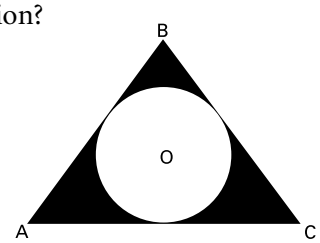
55. In the figure below, the perimeter of triangle OAB is 22 inches. What is the area of circle O, in square inches?

A. 6 π
B. 36
C. 12 π
D. 24 π
E. 36 π



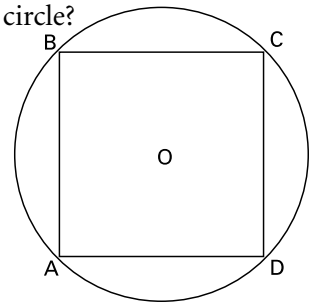
56. In the figure below, circle O has a diameter of 8 inches and is inscribed in triangle ABC. The area of triangle ABC is 64 square inches. What is the area of the shaded region?

F. 64 - 64 π
G. 64 - 16 π
H. 64 - 8 π
J. 64 - 4 π
K. 64 - 2 π



57. In the figure below, square ABCD is inscribed in circle O. The area of the square is equal to 36. What is the area of the circle?

A. $3\sqrt{2}\ \pi$
B. 6 π
C. 18 π
D. 36 π
E. 72 π



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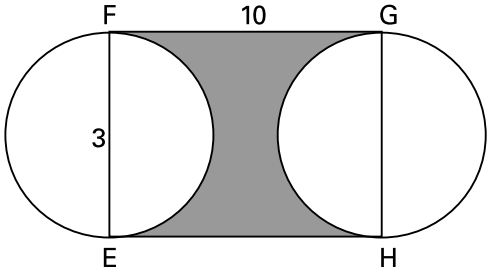
DO YOUR FIGURING HERE.

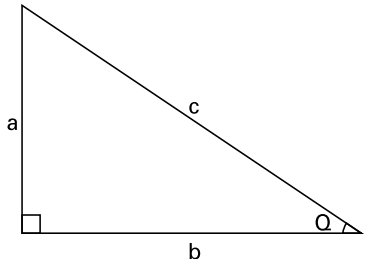
58. In the figure below, EF and GH are diameters of identical circles. Side FG of rectangle EFGH has a length of 10. What is the area of the shaded region?

F. $30 - 9\pi$
G. $30 - 2.25\pi$
H. $60 - 9\pi$
J. $60 - 6\pi$
K. $60 - 3\pi$



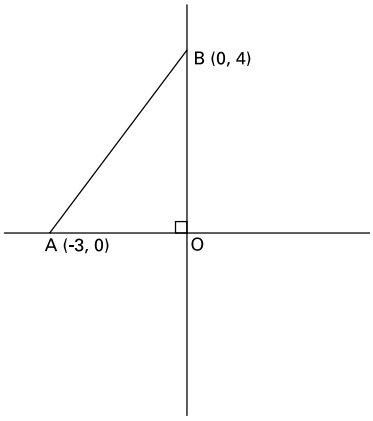
59. In the figure below, what is the tangent of angle Q?

A. $\frac{a}{b}$
B. $\frac{b}{a}$
C. $\frac{a}{c}$
D. $\frac{b}{c}$
E. $\frac{c}{b}$



60. In the figure below, what is the sine of angle BAO?

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



END OF MATHEMATICS TEST.
STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

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 circle the letter corresponding to your choice. You may refer to the passages as often as necessary.

Passage I

PROSE FICTION: This selection is adapted from the chapter "Boston" in Charles Dickens American Notes, published in 1842. The author is describing his first impressions of the town of Boston.

In all the public establishments of America, the utmost courtesy prevails. When I landed in America, I could not help being strongly impressed with the contrast their Customhouse presented, and the attention, politeness and good humour with which its officers discharged their duty.

As we did not land at Boston, in consequence of some detention at the wharf, until after dark, I received my first impressions of the city in walking down to the Customhouse on the morning after our arrival, which was Sunday. I am afraid to say, by the way, how many offers of pews and seats in church for that morning were made to us, by formal note of invitation, before we had half finished our first dinner in America, but if I may be allowed to make a moderate guess, without going into nicer calculation, I should say that at least as many sittings were proffered us, as would have accommodated a score or two of grown-up families. The number of creeds and forms of religion to which the pleasure of our company was requested was in very fair proportion.

Not being able, in the absence of any change of clothes, to go to church that day, we were compelled to decline these kindnesses, one and all; and I was reluctantly obliged to forego the delight of hearing Dr. Channing, who happened to preach that morning for the first time in a very long interval. I mention the name of this distinguished and accomplished man (with whom I soon afterwards had the pleasure of becoming personally acquainted), for the gratification of recording my humble tribute of admiration and respect for his high abilities and character; and for the bold philanthropy with which he has ever opposed himself to that most hideous blot and foul disgrace Slavery.

To return to Boston. When I got into the streets upon this Sunday morning, the air was so clear, the houses were so bright and gay; the signboards were painted in such gaudy colors; the gilded letters were so very golden; the bricks were so very red, the stone was so very white, the blinds and area railings were so very green, the knobs and plates upon the street doors so marvelously bright and twinkling; and all so slight and insubstantial in appearance—that every thoroughfare in the city looked exactly like a scene in a pantomime. It rarely happens in the business streets that a tradesman, if I may venture to call anybody a tradesman, where everybody is a merchant, resides above his store; so that many occupations are often carried on in one house, and the whole front is covered with boards and inscriptions. As I walked along, I kept glancing up at these boards, confidently expecting to see a few of them change into something; and I never turned a corner suddenly without looking out for the clown and pantaloon, who, I had no doubt, were hiding in a doorway or behind some pillar close at hand. As to Harlequin and Columbine, I discovered immediately that they lodged (they are always looking after lodgings in a pantomime) at a very small clockmaker's one story high, near the hotel; which, in addition to various symbols and devices, almost covering the whole front, had a great dial hanging out—to be jumped through, of course.

The suburbs are, if possible, even more insubstantial looking than the city. The white wooden houses (so white looking that it makes one wink to look at them), with their green jalousie blinds, are so sprinkled and dropped about in all the directions, without seeming to have any root at all in the ground; and the small churches and chapels are so prim and bright, and highly varnished; that I almost believed the whole affair could be taken up piecemeal like a child's toy, and crammed into a little box.

The city is a beautiful one, and cannot fail, I should imagine, to impress all strangers very favourably. The private dwelling-houses are, for the most part, large and elegant; the shops extremely good; and the public buildings handsome. The State House is built upon the summit of a hill, which rises gradually at first, and afterwards by a steep ascent, almost from the water's edge. In front is a green enclosure called the Common. The site is beautiful, and

GO ON TO THE NEXT PAGE

from the top there is a charming panoramic view of the whole town and neighborhood. In addition to a variety of commodious offices, it contains two handsome chambers; in one the House of Representatives of the State hold their meetings: in the other, the Senate. Such proceedings as I saw here were conducted with perfect gravity and decorum, and were certainly calculated to inspire attention and respect.

There is no doubt that much of the intellectual refinement and superiority of Boston is referable to the quiet influence of the University of Cambridge, which is within three or four miles of the city. Whatever the defects of American universities may be, they disseminate no prejudices; rear no bigots; dig up the buried ashes of no old superstitions; never interpose between the people and their improvement; exclude no man because of his religious opinions; above all, in their whole course of study and instruction, recognize a world, and a broad one too, lying beyond the college walls.

It was a source of inexpressible pleasure to me to observe the almost imperceptible, but not less certain effect, wrought by this institution among the small community of Boston and to note at every turn the humanizing tastes and desire it has engendered; the affectionate friendships to which it has given rise; the amount of vanity and prejudice it has dispelled.

1. What color were the area railings?
   A. golden
   B. green
   C. red
   D. white

2. On what day did Dickens's ship land at Boston?
   F. Thursday
   G. Friday
   H. Saturday
   J. Sunday

3. Which of the following does the author describe as looking like a pantomime?
   A. the churches
   B. the suburbs
   C. the thoroughfares in the city
   D. the University of Cambridge

4. Why was Dickens unable to attend church on Sunday morning?
   F. he did not have a change of clothes.
   G. he did not have a seat in the church.
   H. his family did not want to attend.
   J. Dr. Channing was not preaching that morning.

5. Where is the State House located?
   A. near the University of Cambridge
   B. on the summit of a hill in the city
   C. in the suburbs
   D. near the wharf

6. The author suggests that the number of different types of religions in Boston was:
   F. very large.
   G. different from those in England.
   H. limited.
   J. exactly like those in England.

7. Dickens thought that the city of Boston was
   A. insubstantial.
   B. hideous.
   C. not very beautiful.
   D. imperceptible.

8. All of the following are characteristics of American universities EXCEPT:
   F. they disseminate no prejudices.
   G. they exclude no one because of religious opinions.
   H. they engender humanizing tastes.
   J. they encourage vanity and prejudice.

9. "It rarely happens…that a tradesman…resides above his store." (lines 42-45) This is due to the fact that:
   A. all tradesmen are merchants.
   B. the rooms above the store are rented to foreign guests.
   C. the space is used for tradesmen of other occupations.
   D. the rooms are rented to University students.

10. The author refers to which of the following as being "like a child's toy?"
    F. the State House
    G. the suburbs
    H. the thoroughfares
    J. the stores

GO ON TO THE NEXT PAGE

Passage II

SOCIAL SCIENCES: This passage is adapted from the book Behavior and Existence: An Introduction to Empirical Humanistic Psychology (© 1982 by Howard R. Pollio). The author of this article discusses recent research into the accuracy of eyewitness testimony.

For an ordinary event as well as a dangerous one, many witnesses seem unable to recall what happened in a reliable way. Thus, "being there" does not guarantee that a witness "saw anything" or that he or she will be able to recall anything of importance later on. Yet these are exactly the conditions under which most witnesses testify: they are asked to describe an event that may have frightened them or an event that was of only marginal interest to them. As Stem put it, "Very often bodily presence may go along with complete lack of attention [and/or] ... observation ... [and then] the inquirer's insistence—'The event happened before your eyes; you must have observed it'—is psychologically unsound and often nothing but a misleading suggestion."

Before it is possible to analyze the relation of testimony to a theory of memory, it is necessary to look at some of the more recent experimental techniques used in studying testimony. One of the major modern techniques, developed by Elizabeth Loftus of the University of Washington, involves showing a group of students (usually 100 at a time) a film of an automobile accident. In this film, a car makes a turn into the stream of traffic and causes a five-car, bumper-to-bumper collision. After viewing the film, witnesses are asked a series of questions. For one of her experimental groups, Loftus worded the initial question as follows: "Did you see a broken headlight?" For a second group, the question was worded slightly differently: "Did you see the broken headlight?" Although this may seem a minor difference, the "a question" seems tentative, while the "the question" seems much surer. In fact, 15% of the "the question" witnesses answered yes, whereas only 7% of "a question" witnesses said yes. The frequency of "I don't know" answers was 38% for "a questions" and only 13% for "the questions." Thus, the use of "a" or "the" in a question makes a big difference in leading the witness to report a nonexistent aspect of an accident.

In a different experiment using the same film, witnesses were asked to estimate the speed as one car *hit/smashed/bumped/collided with/or contacted* another car. *Smashed* cars were estimated to be going at 41 mph, *collided* with cars 39 mph, *bumped* cars 38 mph, *hit* cars 34 mph, and *contacted* cars 32 mph. A change of words produced average differences of 9 mph. Other experiments have also shown that how a question is worded affects what is recalled. For example, when the same accident film was used, 53% of people asked the question "How fast was Car A going when it ran the stop sign?" reported that they saw a stop sign. Only 35% asked the question "How fast was Car A going when it turned right?" reported seeing a stop sign.

Some of the basic results, then, suggest that asking a person one type of question rather than another may change his or her report of a previously experienced event. Even for the most scrupulously honest subject, information given (or, perhaps more important, asked for) after an event has been experienced will affect what is remembered about that event. These experiments make the important points that questioning can help a person recall a nonexistent or an "actual" event and that recalls produced after initial questioning may alter what is later remembered.

Such results provide the real meaning of the testimony experiment for a psychology of remembering: every bit of what we recall is always recalled in some context or other, after one or another intervening experience, and the recall situation and the intervening event(s) strongly determine what we will produce as our recall right now. Every memory partakes as much of the present as of the past, and to recall always represents an attempt to speak with the past, with me as the living link between then and now.

For this reason, it is not surprising to find that my past sometimes speaks to me in ways I cannot understand or even recover. If I am unable to remember something I "ought to be able to," such a lapse must have some personal significance for me. Forgetting and remembering, like all the activities of a life, reveal us to ourselves and to others. This idea, although now obvious, was first pointed out 70 years ago by Sigmund Freud.

11. According to the passage, what characteristic of witnesses makes them unable to recall accurately what happened at a dangerous event?
    A. the witness was not at the event
    B. the witness may have been frightened by the event
    C. the witness is psychologically unsound
    D. the witness was paying attention to the event

GO ON TO THE NEXT PAGE

12. Which sequence below arranges the speeds at which cars were supposedly traveling from the slowest speed to greatest speed?
    F. contacted, bumped, hit, smashed
    G. smashed, bumped, hit, contacted
    H. contacted, hit, bumped, smashed
    J. contacted, smashed, hit, bumped

13. According to the passage, remembering is LEAST like which of the following?
    A. videotaping an event
    B. recalling events when asked probing questions
    C. attempting to speak with the past
    D. being influenced by intervening events

14. What percentage of students responded "I don't know" to the question "Did you see the broken headlight?"
    F. 7%
    G. 13%
    H. 15%
    J. 38%

15. It can be inferred from the passage that what percentage of students did NOT report seeing a stop sign when asked the question "How fast was Car A going when it ran the stop sign?"
    A. 35%
    B. 47%
    C. 53%
    D. 65%

16. What percentage of students answered "No" to the question "Did you see a broken headlight?"
    F. 7%
    G. 13%
    H. 15%
    J. 55%

17. What is the main idea of this passage?
    A. to show how accurate memory can be in different circumstances
    B. to criticize experiments on eyewitness testimony
    C. to demonstrate how information given after an event will affect recall
    D. to explain how recent research on memory is derived from Freud

18. Suppose someone can't find his or her car keys just as he or she is about to leave to go to school or work. The author suggests that this act of forgetting might mean which of the following?
    F. an act that reveals something of personal significance.
    G. a situation that involves a frightening event.
    H. an action that prevented an accident from happening.
    J. support for the experimental results mentioned in the passage.

19. How many students would normally watch the film of the automobile accident in the Loftus experiment?
    A. 1
    B. 7
    C. 15
    D. 100

20. Which of the following, according to the author, might be a good first question to ask eyewitnesses of an automobile accident?
    F. Did you see one car hit the other car?
    G. What did you see?
    H. How fast were the two cars going when they collided?
    J. Did one car run the stop sign?

GO ON TO THE NEXT PAGE

Passage III

HUMANITIES: This passage is adapted from the article "Repugnant is to Aversion: A Look at ETS and the New SAT I" by Michael K. Smith (© 1994 by Michael K. Smith). The author of this article examines the changes in the SAT college admissions examination that were introduced in 1994.

For more than a decade I have been helping high school students prepare for college entrance exams. Together, we have reviewed basic formulae of high school mathematics, struggled with the word problems that appear on the exam, memorized lists of vocabulary words needed for certain parts of the verbal section, and practiced coping with the strenuous time limits of the test. As always, the Educational Testing Service (ETS) and the College Entrance Examination Board have helped me with my task by publishing collections of previously administered exams. It is very satisfying to see students come to 'understand' this exam well enough to achieve scores that help them gain admission to the colleges they choose.

Thus it was with much anticipation that I followed the recent changes occurring in one of my favorite entrance exams. Not only did the name change (from Scholastic Aptitude Test to Scholastic Assessment Tests and, finally, to SAT 1: Reasoning Test), but also, according to the College Board, the test itself was changing: "A completely redesigned SAT will be administered beginning in the spring of 1994." For decades students had taken the same types of vocabulary and mathematical questions. Now the test was supposedly changing. As my students and I were preparing for the first administration of the "new SAT," we considered with some trepidation the words of the College Board: "Developed jointly by the College Board and the Educational Testing Service, the revised SAT contains content and format changes necessary to ensure a valid measure of students' academic preparedness for college work throughout the 1990s and beyond."

I know that the College Board and ETS have not ventured into this new endeavor by accident; their literature informs us that "three years of extensive research and field testing" preceded the 1990 approval of the new format by the College Board trustees. The College Board also adopted a recommendation of its own Commission on New Possibilities for the Admissions Testing Program that it "adapt its tests so that they assess a greater variety of skills and knowledge and thereby serve a wider range of needs." The College Board was thus displaying not only its flexibility but also its prescience: "The revised SAT recognizes the increasing diversity of students in our educational system, as well as changes in how and what these students are being taught in secondary school. The new testing program will assess many of the skills important to students' success in college."

So just how thorough are these changes to the SAT? Is the revised SAT a radical departure from its previous version? The College Board states that the new SAT gives students more time to answer questions. According to one issue of the College Board newsletter, "The primary benefit is that students will have more time to think about the questions in both the verbal and math sections." Since time pressure has been reduced, students should feel more comfortable with the exam: "The less speeded test should also reduce student anxiety." In my opinion, having more time per problem would be a tremendous advantage on this test because students often feel that they must race through the exam in order to attempt all the problems.

So how much time are we talking about? On the old SAT verbal sections, students had 60 minutes to complete 85 problems, an average of .71 minutes per problem. On the new SAT (based on the sample test I examined), students were presented with 78 problems in 75 minutes. Thus seven problems were eliminated and 15 minutes added to the exam. This works out to an average of .96 minutes per problem on the verbal sections. Similarly, on the math sections of the old SAT, students had 60 minutes for 60 problems, an average of one minute per problem. On the new SAT math sections, students had 75 minutes for 60 problems, for an average of 1.25 minutes per problem. Thus on both sections of the SAT students now have an average of 15 more seconds per problem than test-takers had previously.

My students and I will take the extra seconds. However, I'll still have to caution them against extended reveries (unless they're restricted to the 15-second variety) and urge them to move almost as quickly through this new exam as through the old SAT. What interests me is the context in which the College Board places this revision on the time limits. The College Board notes: "The revised SAT reflects

GO ON TO THE NEXT PAGE

the educational reform movements of the 1980s and 1990s." I believe that I have followed these reform movements pretty closely, and it seems to me that educators have called for different types of assessments: performance assessments, authentic assessments, exhibitions, portfolios, and the like. I believe that most of these new assessments would allow substantially more than a minute to solve a problem. Unless, of course, I have completely misread the literature in this area or have missed the publication of The One-Minute Portfolio. Although the College Board is promoting the changes to the SAT as revolutionary, I still have my doubts.

21. The main purpose of this passage is to
    A. explain in detail the changes to the revised SAT.
    B. suggest that changes to the revised SAT may not be as radical as ETS claims.
    C. provide students with a list of ways to prepare for the SAT.
    D. discuss the changes to the time limits on the revised SAT.

22. As used in line 13, the word "understand" most nearly means
    F. be prepared for.
    G. criticize.
    H. pass.
    J. explain.

23. The author's attitude toward the revised SAT could best be described as
    A. supportive.
    B. laudatory.
    C. skeptical.
    D. inflexible.

24. As used in line 86, the word "reveries" most nearly means
    F. problem-solving.
    G. conversations.
    H. partying.
    J. daydreams.

25. How many fewer problems are there on the revised SAT than on the old SAT?
    A. 7
    B. 15
    C. 60
    D. 78

26. The passage suggests that all of the following types of assessments were introduced in the past two decades EXCEPT
    F. performance assessments.
    G. exhibitions.
    H. portfolios.
    J. vocabulary tests.

27. The passage suggests that the total time allotted for students to take the verbal and mathematical sections on the revised SAT is
    A. 75 minutes.
    B. 120 minutes.
    C. 150 minutes.
    D. 180 minutes.

28. According to the College Board, the revised SAT was designed to recognize all of the following EXCEPT
    F. diversity of students in the educational system.
    G. revisions in national mathematical standards.
    H. changes in how and what students are taught.
    J. skills important to success in college.

29. The author's information on the types of questions on the SAT primarily comes from
    A. personal communications with the College Board.
    B. materials given to him by students.
    C. newspaper accounts.
    D. previously administered exams.

30. It can be inferred from the passage that the author would prefer which of the following examinations?
    A. a one hour 60 item vocabulary test
    B. a one hour 60 item math test
    C. a three hour verbal and math test with 180 items
    D. a two hour verbal and math test with 20 items

GO ON TO THE NEXT PAGE

Passage IV

NATURAL SCIENCES: The author of the following article reports on recent research related to diseases of the brain, particularly mad cow disease and Creutzfeldt-Jakob disease.

The National Institutes of Health has reported that various diseases of the brain that affect both animals and humans have become more prevalent in various parts of the world. For instance, health officials report that about six percent of the mule deer in the area of northern Colorado and southern Wyoming suffer from chronic wasting disease, or CWD. The entire population of mule deer in Colorado, about 550,000 according to recent estimates, is at risk of developing certain forms of CWD. Several cases of mad cow disease, or bovine spongiform encephalopathy (BSE), have been reported in Great Britain. A new strain considered its human equivalent, Creutzfeldt-Jakob disease (CJD), is still rare, affecting just one in a million people annually in the United States. This disease, however, is fatal, and kills its victim about seven months after symptoms appear. All three diseases produce spongelike holes in the victims' brains; symptoms at outset of the disease include loss of muscle control and dementia.

All three diseases—CWD, mad cow, and Creutzfeldt-Jakob—are blamed on infectious rogue proteins called prions, which are mutant versions of proteins that occur normally in the body. Prions are considered an entirely new type of disease-causing agent, distinct from bacteria, viruses, fungi or parasites.

Prions are a class of poorly understood proteins implicated in a number of exotic human neurological diseases and in some common animal diseases. Prions have been strongly implicated in Creutzfeldt-Jakob disease, which appears to have a genetic basis in about 15% of the cases. What is remarkable about prions is that they behave as infectious agents, but they are 100 times smaller than viruses and their mechanism of replication is unclear. All the prion diseases are apparently associated with the accumulation in the brain of an abnormal protease-resistant isoform of the prion protein PrP. In other words, an abnormal variant of the normal PrP is somehow copied or produced by the disease process, which can be initiated by introducing infectious prions into the system.

B. Chesebro, of Rocky Mountain Laboratories, in a review of current research on prion diseases, points out that although the idea of prions as self-sufficient infectious proteins has received a great deal of publicity because of the recent award of the Nobel Prize in Medicine and Physiology to S. Prusiner for the discovery of prions, "at the present time the fact remains that there are no definitive data on the nature of prions." Dr. Chesebro suggests that it would be tragic if the recent Nobel Prize award were to lead to complacency regarding the obstacles still remaining in prion research, and that "it is not mere detail, but rather the central core of the problem, that remains to be solved."

Some recent research might help solve the mystery. British researchers claim to have found a gene that regulates how fast mad cow disease can develop in mice, and perhaps in humans as well. There are two versions of the prion gene, one fast and one slow. These researchers worked with mice injected with an experimental strain of BSE. They genetically engineered the mice so they had one or the other version of the prion gene. The difference between the two genes is subtle—only two amino acids are affected. The mice that had the "fast" version of the gene developed BSE twice as quickly as those that had the "slow" version. The "slow" mice developed the disease in 250 days, while those engineered to have the "fast" version developed BSE in 133 days. The researchers feel their findings might translate to people. CJD naturally occurs in one in a million people, but a new version linked to BSE was identified two years ago and has killed or infected 23 people in Britain. Every one of the 23 had the "fast" version of the prion gene. What is not clear, however, is whether the slow version means infected people will develop the new variant of CJD more slowly, or whether it makes the incubation period so long that they will never develop it all.

Researchers do not know whether the 23 victims are the leading edge of an epidemic, or unfortunate but rare cases. Knowing more about what affects the incubation period of the new strain will help predict whether an epidemic is yet to come.

GO ON TO THE NEXT PAGE

31. As a disease-causing agent, prions are distinct from all of the following EXCEPT:
    A. bacteria.
    B. fungi.
    C. parasites.
    D. proteins.

32. How frequently does CJD occur in humans?
    F. six percent of humans
    G. one in every 23 clinical cases
    H. one in a million people annually
    J. it does not occur in humans

33. How quickly does CJD prove fatal after symptoms have appeared?
    A. seven months
    B. ten months
    C. one year
    D. two years

34. Dr. Chesebro suggests that knowledge about how prions work is
    F. definitive.
    G. inconclusive.
    H. widely known.
    J. researched only in Britain.

35. Mice with the "fast" gene for BSE developed the disease in
    A. 133 days.
    B. 250 days.
    C. one year.
    D. never.

36. Approximately how many of the mule deer population in Colorado suffer from CWD?
    F. 23
    G. 33,000
    H. 55,000
    J. 550,000

37. According to the author, cases of CJD have occurred in which of the following countries?
    A. Britain only
    B. United States only
    C. Britain and the United States
    D. Britain and Europe

38. The author suggests that people with the "slow" gene will develop CJD:
    F. in 133 days.
    G. in 250 days.
    H. in about a year.
    J. it is not clear when or if these people will develop CJD.

39. Prion diseases are associated with the accumulation in the brain of which of the following?
    A. BSE
    B. CJD
    C. CWD
    D. PrP

40. The major genetic difference between "slow" and "fast" prion genes used in the experimental research on mice is
    F. a different incubation period.
    G. two amino acids.
    H. a different mechanism of replication.
    J. their effect on humans.

END OF READING TEST.
STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

SCIENCE REASONING TEST

35 Minutes—40 Questions

DIRECTIONS: There are seven passages in this test. Each passage is followed by several questions. After reading a passage, circle the best answer to each question. You may refer to the passages as often as necessary. You are NOT permitted to use a calculator on this test.

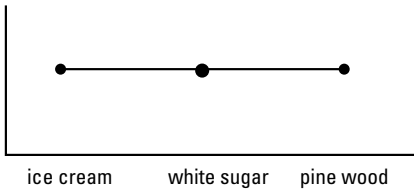
Passage I

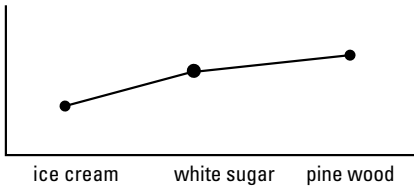
The heat value of fuels and foods is determined from the heat of combustion—the heat produced per unit mass of substance burned in oxygen. The following table shows the heat of combustion for selected fuels and foods. The measurements are given in kilocalories (kcal) per kilogram (kg) of substance burned.

	Heat of Combustion (kcal/kg)
Fuels	
Natural gas	8000-12000
Gasoline	11300
Diesel oil	10500
Fuel oil	10300
Anthracite coal	7000-8000
Alcohol	6400
Wood, pine	4500
Foods	
Bread, white	2600
Butter	7950
Eggs	
Boiled	1600
Scrambled	2100
Ice cream	2100
Meat, lean	1200
Milk	715
Peanuts	5640
Potatoes, white boiled	970
Rice, cooked	1120
Sugar, white	4000

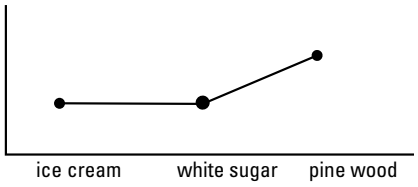
1. The difference between the heat of combustion for alcohol and lean meat is:
   A. 1200.
   B. 4300.
   C. 5200.
   D. 6400.

2. Which of the following graphs shows the correct representation for the heat of combustion of ice cream, white sugar, and pine wood?

F. 

G. 

H. 

J. 

3. How many kilograms of scrambled eggs would need to be burned to give off as many kilocalories as those given off by burning one kilogram of diesel oil?
   A. 2
   B. 3
   C. 4
   D. 5

GO ON TO THE NEXT PAGE

4. If rye bread had a heat of combustion somewhere between white bread and ice cream, then its heat of combustion could be which of the following values?
   F. 2100
   G. 2200
   H. 2600
   J. 2700

5. Which of the following foods have a heat of combustion lower than any fuel listed in the table?
   I. Butter
   II. Peanuts
   III. Rice, cooked
   A. III only
   B. I and II only
   C. I and III only
   D. I, II, and III only

GO ON TO THE NEXT PAGE

Passage II

Phosphates are products formed by the replacement of some or all of the hydrogen of a phosphoric acid by metals. Phosphates are important to metabolism in both plants and animals. In the past, attention was focused on the environmentally harmful effects of phosphates in both household and industrial detergents. Wastewater from laundering agents containing phosphates is known to be a water pollutant because phosphates are a primary nutrient of algae; when it grows in excess, algae can choke a lake or river and draw off needed oxygen from aquatic life.

Experiment 1

The wastewater from three different sites was sampled. For each site, the population density (residents per square mile) was calculated. The percent of algae contained in the wastewater was also recorded. Results are presented in Table 1.

Table 1

Site	Population Density	Algae
One	1000	5.40
Two	100	2.70
Three	10	1.35

Experiment 2

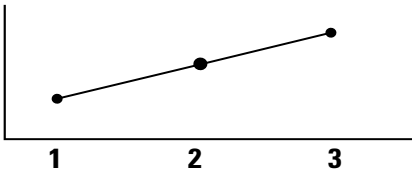
The wastewater from three different sites was sampled. For each site, the industrial concentration (number of industrial plants per ten square miles) was calculated. The percent of algae contained in the wastewater was also recorded. Results are presented in Table 2.

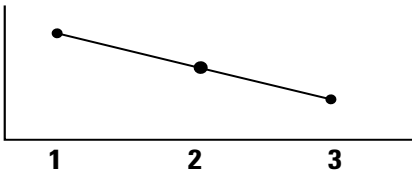
Table 2

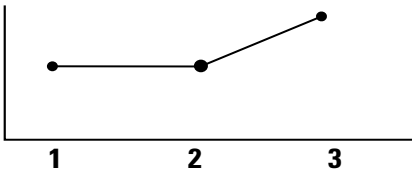
Site	Industrial Concentration	Algae
One	1	1.20
Two	2	2.45
Three	3	5.00

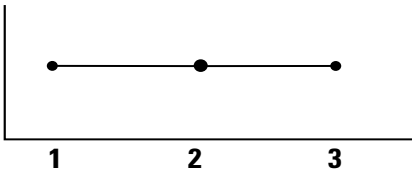
6. The percent of algae corresponding to a population density of 100 is:
   F. 1.20.
   G. 1.35.
   H. 2.70.
   J. 5.40.

7. Which of the following graphs the relationship between industrial concentration and percent of algae?

A.


B.


C.


D.


8. From the data in Experiment 2, a site with an industrial concentration of 4 would be projected to have what percent of algae contained in wastewater?
   F. 5.00
   G. 6.20
   H. 7.45
   J. 10

GO ON TO THE NEXT PAGE

9. Which of the following sites are very similar in their percent of algae in wastewater?
    A. Experiment 1, Site One and Experiment 2, Site One
    B. Experiment 1, Site Three and Experiment 2, Site One
    C. Experiment 1, Site Two and Experiment 2, Site Three
    D. Experiment 1, Site Three and Experiment 2, Site Three

10. The algae in the wastewater of a new site is measured and determined to have a percent of 5.20. This new site could have:
    F. Population Density of 1000 or Industrial Concentration of 1.
    G. Population Density of 100 or Industrial Concentration of 3.
    H. Population Density of 100 or Industrial Concentration of 2.
    J. Population Density of 1000 or Industrial Concentration of 3.

11. Which of the following new experiments could help determine whether higher percents of algae in wastewater are due to population density or industrial concentration?
    A. Repeating Experiment 1 with different levels of Population Density
    B. Repeating Experiment 2 with different levels of Industrial Concentration
    C. Conducting a new experiment that records both Population Density and Industrial Concentration at each site
    D. Measuring other variables in both experiments

GO ON TO THE NEXT PAGE

Passage III

The efficiency of the internal combustion engine is related to two factors: the octane rating of the fuel and the compression ratio. Lower octane levels cause "knocks" in the engine; that is, ignition occurs more as an explosion, or knock, than as a smooth burning. The octane rating of a gasoline is a measure of the knock produced when the gasoline is used as an automobile fuel. Fuels with octane ratings greater than 100 have superior antiknock properties. Table 1 lists the minimum octane numbers required for various engine compression ratios.

The octane rating of gasolines can be improved by adding small amounts of certain substances. The most common additive is a compound called tetraethyl lead (TEL). Table 2 shows the improvement in octane ratings for certain hydrocarbons as a function of adding 3.0 milliliters (mL) of TEL per gallon of gasoline. The molecular formula for each substance is also listed (C = Carbon, H = Hydrogen)

Table 1

Engine Compression Ratio	Octane Number Required
5:1	73
6:1	81
7:1	87
8:1	91
9:1	95
10:1	98
11:1	100
12:1	102

Table 2

Octane Numbers of Some Hydrocarbons, With and Without TEL

Hydrocarbon	Molecular Formula	Octane Number	
		No TEL	TEL
n-Butane	C_4H_{10}	93.6	101.6
n-Pentane	C_5H_{12}	61.7	88.7
2-Methylbutane	C_5H_{12}	92.6	102.0
n-Hexane	C_6H_{14}	24.8	65.3
n-Heptane	C_7H_{16}	0.0	43.5
Methylbenzene	C_7H_8	103.2	111.8
n-Octane	C_8H_{18}	-19.0	25.0
Trimethylpentane	C_8H_{18}	100.0	115.5
Isopropylbenzene	C_9H_{12}	113.0	116.7

12. Which Engine Compression Ratio would require a fuel with an octane number that has superior antiknock properties?
    F. 9:1
    G. 10:1
    H. 11:1
    J. 12:1

13. Adding TEL to Trimethylpentane improves its octane number by approximately how much?
    A. 15
    B. 25
    C. 100
    D. 115

14. With added TEL, which of the following hydrocarbons improves its octane number by at least 10?
    I. *n*-Butane
    II. *n*-Pentane
    III. 2-Methylbutane
    F. I only
    G. II only
    H. I and II only
    J. I, II, and III only

GO ON TO THE NEXT PAGE

15. The largest improvement in octane number, after adding TEL, occurs in which of the following hydrocarbons?
    A. *n*-Hexane
    B. *n*-Heptane
    C. *n*-Octane
    D. Isopropylbenzene

16. How many of the hydrocarbons in the table would have a high enough octane number (after adding TEL) to power any of the Engine Compression Ratios listed in Table 1?
    F. 3
    G. 4
    H. 5
    J. 6

GO ON TO THE NEXT PAGE

Passage IV

The following table presents some statistics for various variables related to the Sun and the Planets.

	Sun	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Distance from sun (millions of miles)		36	67	93	140	480	890	1800	2800
Mass (earth=1)	333,000	0.06	0.82	1.0	0.11	318	95.2	14.5	17.2
Diameter (thousands of miles)	867	3.0	7.6	7.9	4.2	89	76	30	28
Density (water=1)	1.4	5.4	5.1	5.5	3.9	1.3	0.7	1.3	1.6
Rotation period (earth days)	27	59	243	1	1	0.4	0.4	0.4	0.6
Length of year*		88^{d}	225^{d}	1^{yr}	687^{d}	12^{yr}	30^{yr}	84^{yr}	165^{yr}
Velocity of escape (miles/second)		2.2	6.2	7.0	3.1	37	22	13	14
Number of moons		0	0	1	2	14	17	15	2
Average surface temperature (K)	5800	600	750	285	240	128	105	70	55
Surface gravity (earth=1)	28	0.37	0.89	1.00	0.38	2.74	1.14	0.96	1.15

*d = earth days; yr = earth years

GO ON TO THE NEXT PAGE

17. The rotation period for the Earth is how many days longer than the rotation period for Neptune?
    A. .4
    B. .6
    C. 1
    D. 2

18. The Earth has larger values than Venus for all of the following characteristics EXCEPT:
    F. mass.
    G. density.
    H. length of year.
    J. surface temperature.

19. The length of the year on Mars has which of the following relationships to the length of the year on the Earth (assume 1 year = 365 days on Earth)?
    A. The Mars year is 322 days longer
    B. The Mars year is 686 days longer
    C. The Mars year is 322 days shorter
    D. The Mars year is 686 days shorter

20. The average surface temperature of the planets has which of the following relationships with their distance from the Sun?
    F. As distance increases from the Sun, surface temperature rises.
    G. As distance increases from the Sun, surface temperature decreases.
    H. As distance increases from the Sun, surface temperature remains constant.
    J. There is no relationship between the two variables.

21. The velocity of escape for the planets has which of the following relationships with the mass?
    A. As mass increases, velocity of escape increases.
    B. As mass increases, velocity of escape decreases.
    C. As mass increases, velocity of escape remains constant.
    D. There is no relationship between the two variables.

GO ON TO THE NEXT PAGE

Passage V

Starting approximately sixty million years ago, the temperature of the Earth's surface cooled and glaciers advanced to cover Antarctica, Greenland, and parts of North America and Europe. These glacial advances marked the beginning of the Cenozoic Ice Age, which lasted at least 20 million years. Two scientists discuss the possible origins of this Ice Age.

Scientist 1

The Milankovitch model proposes that, as the Earth's orbit slowly changes, so does the amount of sunlight falling on a given spot on the globe. The changes in sunlight can trigger a glacier's advance or retreat. Three factors in the Earth's orbit influence these changes in sunlight. The tilt of Earth's axis varies from 22° to 25° over a period of 41,000 years. The greater the tilt, the more summer sunlight falls on the poles, contributing to glacial retreat. The Earth wobbles like a top in a cycle that lasts 23,000 years, changing the fraction of sunlight that strikes each hemisphere. The shape of the Earth's orbit around the sun ranges from circular to more elliptical over a period of 100,000 years. A circular orbit means less sunlight over the course of the year. All three factors combined at the beginning of the Cenozoic Age to produce conditions that caused less sunlight to shine on the poles, thus triggering a massive, rapid advance of the glaciers.

Scientist 2

The cooling that started sixty million years ago had to be caused by a sharp drop in carbon dioxide in the atmosphere. Carbon dioxide traps sunlight close to the Earth, raising the planet's temperature. Less carbon dioxide in the atmosphere triggers colder weather and a massive drop in carbon dioxide could have initiated the Cenozoic Ice Age.

What could have produced such a massive drop in carbon dioxide? I believe that two of the Earth's tectonic plates collided at this period of time, producing what are now the Himalayan mountains. Evidence indicates that the Himalayans were formed approximately 70 to 50 million years ago. Carbon dioxide combines with rain to form an acid that erodes rock. Additionally, as rock erodes, it releases calcium silicate, which reacts with carbon dioxide in such a way as to remove it from the atmosphere. Therefore, erosion on slopes as large as the Himalayans could significantly reduce carbon dioxide levels enough to start the Ice Age.

The Milankovitch theory can account for small changes in glacial advances and retreats. The changes in the Earth's orbit, however, do not occur over a long enough period of time to produce the lengthy changes which started at the beginning of the Cenozoic Ice Age. The erosion on the Himalayan surface would have occurred over a period of millions of years, as the mountains were being formed.

22. According to Scientist 1, what factors in the Earth's orbit could have contributed to glacial advances?
    - F. Tilt=22°, Circular Orbit
    - G. Tilt=25°, Circular Orbit
    - H. Tilt=22°, Elliptical Orbit
    - J. Tilt=25°, Elliptical Orbit

23. According to Scientist 2, the release of calcium silicate has which of the following effects on carbon dioxide?
    - A. Reduces the amount in the atmosphere
    - B. Increases the amount in the atmosphere
    - C. Does not affect the amount in the atmosphere
    - D. Helps carbon dioxide combine with rain

24. Which of the following facts, if true, would weaken Scientist 1's argument?
    - F. Evidence of tectonic plate shifts 60 million years ago
    - G. High levels of carbon dioxide in today's atmosphere
    - H. Maximum glacial advances of 50 miles due to changes in Earth's orbit
    - J. Maximum glacial advances of several hundred miles due to changes in Earth's orbit

25. Which of the following facts, if true, would strengthen Scientist 2's argument?
    - A. The discovery that the orbital cycle can cause large glacial advances.
    - B, Evidence of glacial advances 100 million years ago.
    - C. Techniques for improved measurement of Earth's orbital tilt.
    - D. Geological evidence of low levels of carbon dioxide in the atmosphere in the Cenozoic period.

GO ON TO THE NEXT PAGE

26. Which of the following facts, if true, would weaken Scientist 2's argument?
    F. The discovery that the orbital cycle can cause large glacial advances.
    G. The period of the Earth's wobble is actually 46,000 years.
    H. Evidence of small glacial advances and retreats over the past 20 million years.
    J. Evidence that calcium silicate reduces the carbon dioxide in the atmosphere.

27. On which point would both scientists agree?
    A. Tectonic collisions occur regularly.
    B. Changes to the Earth can produce dramatic shifts in climate.
    C. Changes in carbon dioxide levels contributed to the start of the Ice Age.
    D. How the Ice Age started.

28. On what point would both scientists disagree?
    F. The time at which the Ice Ages started
    G. How far the glaciers advanced during the Ice Ages
    H. The time length it took for massive advances of the glaciers
    J. The use of theory to explain past phenomena

GO ON TO THE NEXT PAGE

Passage VI

A series of experiments were conducted to determine an animal's bodily defenses against certain viruses.

Experiment 1

Four mice were injected with a suspension of a killed virus, which will not cause a disease. Mice 1 and 2 were injected with a suspension of killed poliovirus. Mice 3 and 4 were inoculated with a preparation of killed influenza virus. Three weeks later, Mice 1 and 3 are injected with live poliovirus, while Mice 2 and 4 are injected with live influenza virus. One week later, Mice 1 and 4 are alive, while Mice 2 and 3 are dead.

Experiment 2

A blood sample from Mouse 1 was taken and separated into two parts: serum and cells. The serum solution was injected into Mouse 5 and the cell solution was injected into Mouse 6. Both mice were then inoculated with live poliovirus. One week later, Mouse 5 is alive and Mouse 6 is dead.

Experiment 3

A blood sample from Mouse 4 was taken and separated into two parts: serum and cells. The serum solution was injected into Mouse 7 and the cell solution was injected into Mouse 8. Both mice were then inoculated with live influenza virus. One week later, Mouse 8 is alive and Mouse 7 is dead.

29. The results of Experiment 1 suggest that the reason Mice 1 and 4 are alive is because:
    A. mice injected with killed poliovirus can defend against any live virus.
    B. mice injected with killed influenza virus can defend against any live virus.
    C. mice injected with a specific killed virus can defend against a live version of the same virus.
    D. mice are naturally able to defend against viruses.

30. The results of Experiment 2 suggest that Mouse 5 was able to defend against the live poliovirus through agents contained in:
    F. cells.
    G. serum.
    H. live poliovirus.
    J. live influenza virus.

31. The results of Experiment 3 suggest that Mouse 8 was able to defend against the live influenza virus through agents contained in:
    A. cells.
    B. serum.
    C. live poliovirus.
    D. live influenza virus.

GO ON TO THE NEXT PAGE

32. All three experiments suggest which of the following conclusions about the body's defenses against viruses?
    F. Injections of dead virus will defend against any live virus.
    G. Substances in cell solutions will defend against any live virus.
    H. Substances in serum solutions will defend against any live virus.
    J. Specific parts of blood defend against specific viruses.

33. Mouse 2 would probably have lived if it had been injected with which of the following before being injected with live influenza virus?
    I. killed influenza virus
    II. serum solution from Mouse 4
    III. cell solution from Mouse 4
    A. I only
    B. III only
    C. I and III only
    D. I, II, and III only

34. If Mouse 1 and Mouse 4 were both injected with Hepatoid C, a live deadly virus, from the results of these experiments what might we conclude?
    F. Both mice will live.
    G. Mouse 1 will live and Mouse 4 will die.
    H. Mouse 1 will die and Mouse 4 will live.
    J. Both mice will die.

GO ON TO THE NEXT PAGE

Passage VII

It is hypothesized that concentrations of greenhouse gases in the atmosphere will continue to increase. These greenhouse gases are a result of such activities as the burning of fossil fuels and the expansion of agriculture. The radiative properties of increased concentrations of greenhouse gases are hypothesized to have various effects on the planet: a net heating effect of the temperature of the planet's surface and a rise in the mean sea level, for example. Two computer models were designed to test the exact effects of these hypotheses.

Model 1

Three scenarios were calculated. In one scenario, the present level of CO_2 in the atmosphere remains constant. In a second scenario, the level of CO_2 doubles in 70 years and then remains constant (the 2 x CO_2 model). In a third scenario, the level of CO_2 quadruples in 140 years and then remains constant (the 4 x CO_2 model). Figure 1 displays the average global Temperature increases under each of these three models for different time periods.

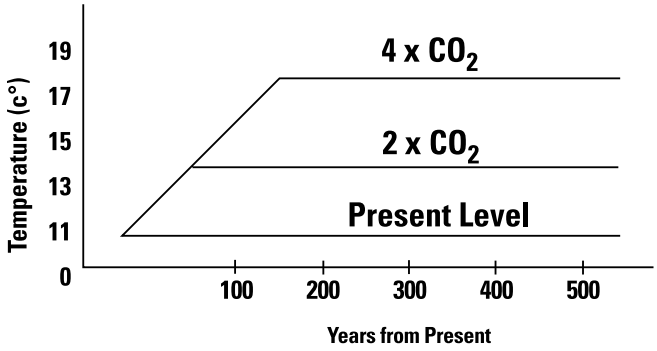


Figure 1

Model 2

Two scenarios were calculated to determine the effects of CO_2 on the rise in Sea Level. In one scenario, the level of CO_2 doubles (the 2 x CO_2 model). In a second scenario, the level of CO_2 quadruples (the 4 x CO_2 model). Figure 2 displays the rise in Sea Level for each scenario for different time periods.

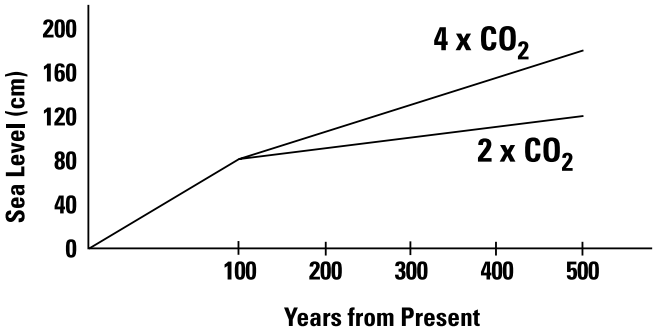


Figure 2

35. After 100 years, how much will global temperature have increased under the 2 x CO_2 model?
    A. 11
    B. 14
    C. 18
    D. 20

36. In how many years from the present will sea level rise 80 cm under the 2 x CO_2 model?
    F. 100
    G. 200
    H. 300
    J. 400

37. At a point 400 years from the present, what is the difference in the predictions for global temperature rise between the 2 x CO_2 model and the 4 x CO_2 model?
    A. 3
    B. 4
    C. 5
    D. 6

GO ON TO THE NEXT PAGE

38. For what time period from the present do the 2 x CO_2 model and the 4 x CO_2 model agree in their predictions of sea level rise?
    F. 100 years
    G. 200 years
    H. 300 years
    J. 400 years

39. For the time period 200 years to 400 years from the present, the ratio of temperature rises in the 4 x CO_2 model to the 2 x CO_2 model does which of the following?
    A. increases
    B. decrease
    C. remains constant
    D. increases and then decreases

40. At a point 600 years from the present, what global temperature rise and sea level rise would we expect under the 4 x CO_2 model?
    F. Temperature = 18, Sea level = 180
    G. Temperature = 18, Sea level = 200
    H. Temperature = 20, Sea level = 180
    J. Temperature = 20, Sea level = 200

END OF SCIENCE REASONING TEST.
STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

