The ACT Assessment®

Sample Test Booklet and Answer Document

A sample answer document appears on pages 61 and 62. Instructions for scoring this sample test begin on page 54.

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

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

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

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

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

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

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

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

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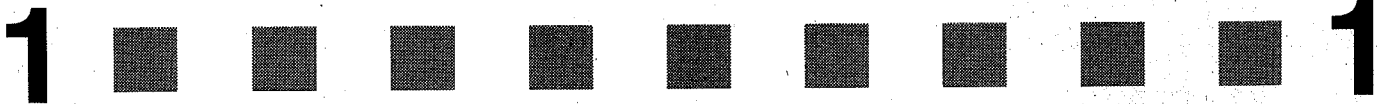
ENGLISH TEST

45 Minutes—75 Questions

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

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

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

PASSAGE I

Amy Tan: The Secret of Her Success

[1]

In the home of Amy Tan's editor, a large blowup of a 1991 *New York Times* best-seller list was hung on the wall. The number one

1. **A.** NO CHANGE
   B. hangs
   C. hung
   D. was hanging

novel, Amy Tan's *The Kitchen God's Wife*, is boldly

2. **F.** NO CHANGE
   G. novel, Amy Tan's *The Kitchen God's Wife* is boldly
   H. novel Amy Tan's *The Kitchen God's Wife*, is boldly,
   J. novel: Amy Tan's *The Kitchen God's Wife*, is boldly

circled. [3] For Tan, the reward of writing is not found

3. At this point, the writer would like to contrast Tan's response to her accomplishments to her editor's response. Which of the following sentences (assuming all are true), if added here, would most successfully achieve this effect?
   A. Tan is considered one of America's best authors.
   B. Success is only one measure of a person, however.
   C. Tan says fame can result in a loss of privacy.
   D. No such symbols of success hang in Tan's home.

in how many books she sells, but if she were to learn about herself from writing them.

4. **F.** NO CHANGE
   G. in what she has learned
   H. if she would learn
   J. what is she to learn

[2]

[5] [1] After college, she spent many

unsatisfying years writing business articles for a variety

of American corporations. [2] Tan, finally realized that
<u>   </u>
6

her discontent stemmed not from the writing itself, but

with the subject matter—she didn't care about business.
<u>   </u>
7

[3]

[1] At first, Tan originally tried to write her
<u>   </u>
8

stories from a non-Chinese perspective,

assuming that work from a Chinese-American

point of view would never be published. [2] But

trying to write from a non-Chinese viewpoint proved
<u>   </u>
9

unfulfilling. [3] Tan came to see that, for her, writing

was a kind of exploration, a way to examine her life.

[4]

Tan also realized that, whether her work was

published or not, one could only learn about oneself by
<u>   </u>
10

writing in her own, Chinese-American, voice. That distinc-

tive voice is part of what made her first novel, *The Joy*

Luck Club, a best-seller.

[5]

In *The Joy Luck Club,* as in much of her

writing, Tan explores the relationships between

mothers and daughters. Her interest in this theme

grew directly from her once difficult relationship

5. Which of the following sentences (assuming all are true), if added here, would best introduce the new subject of Paragraph 2?
  A. Tan began to understand her life by writing about it.
  B. Tan dropped out of medical school to study English.
  C. Writing wasn't always a rewarding experience for Tan.
  D. Finding the right career is difficult for many people.

6. F. NO CHANGE
  G. Tan finally realized, that
  H. Tan finally realized that,
  J. Tan finally realized that

7. A. NO CHANGE
  B. for
  C. from
  D. in

8. F. NO CHANGE
  G. Tan originally
  H. First, Tan originally
  J. In the beginning, Tan first

9. A. NO CHANGE
  B. written from a non-Chinese viewpoint it was
  C. writing from a non-Chinese viewpoint she was
  D. it was from this non-Chinese viewpoint which proved

10. F. NO CHANGE
  G. one could only learn about herself
  H. she could only learn about herself
  J. oneself could only be known

3

GO ON TO THE NEXT PAGE.

with her mother and Tan describes her teen-aged self
<u>11</u>
as "every mother's nightmare." Writing about those years

<u>was given</u> Tan a way of understanding her past—and of
<u>12</u>
coming closer to her mother.

[6]

    Tan, who once felt she could never live up to

her <u>mother's, expectations</u> now feels that her
<u>13</u>
professional success has filled her mother with

pride. <u>On the other hand,</u> Tan says that if she were
<u>14</u>
asked what the most important thing she has done in her

life was, she would answer, "I made my mother happy."

11. **A.** NO CHANGE
   B. mother: Tan
   C. mother, and she also
   D. mother, Tan

12. **F.** NO CHANGE
   G. has gave
   H. had gave
   J. gave

13. **A.** NO CHANGE
   B. mother's expectations
   C. mothers' expectations,
   D. mother's expectations,

14. **F.** NO CHANGE
   G. However,
   H. In fact,
   J. Despite this,

> Question 15 asks about the preceding passage as a whole.

15. In reviewing notes, the writer discovers that the following information has been left out of the essay:

> She decided what she really wanted to do was write fiction.

If added to the essay, the sentence would most logically be placed after Sentence:

   A. 1 in Paragraph 2.
   B. 2 in Paragraph 2.
   C. 2 in Paragraph 3.
   D. 3 in Paragraph 3.

PASSAGE II

> The following paragraphs may or may not be in the most logical order. Each paragraph is numbered in brackets, and question 30 will ask you to choose the best placement of Paragraph 6.

Home Improvement, or Not?

[1]

Have you ever seen those home-improvement shows on television? Beware, for they don't tell the whole story. These shows portray remodeling projects under ideal conditions, not the conditions most of us must contend with. I recently added a second bathroom
<u>16</u>
to my house, doing all the work myself. Over an entire summer, I learned a lot about plumbing, electrical wiring, and carpentry. I also learned about the four stages of remodeling: Enthusiasm, Despair, Adaptation, and Satisfaction.

[2]

The first stage is marked by eagerness. One morning you tear into a wall, feeling <u>a trickle</u> of
<u>17</u>
enthusiasm as plaster crumbles beneath your wrecking bar. That enthusiasm sustains you for days as you take out the old to build the new.

[3]

But the wall <u>your intent to cut</u> an arch
<u>18</u>
through turns out to be brick, not wood. Lifting the floorboards, you find a twisted mess of rusted pipe and rotting wire. About then the building inspector stops by, to ensure proper drainage, she says, you'll have to
<u>19</u>
landscape the lawn.

16. **F.** NO CHANGE
 G. bathroom, adding
 H. bathroom in addition
 J. bathroom not long ago

17. Which of the choices would be most appropriate here?
 A. NO CHANGE
 B. a surge
 C. a twinge
 D. an ounce

18. **F.** NO CHANGE
 G. your intending to cut
 H. your intent on cutting
 J. you intended to cut

19. **A.** NO CHANGE
 B. by; to
 C. by, to,
 D. by to

GO ON TO THE NEXT PAGE.
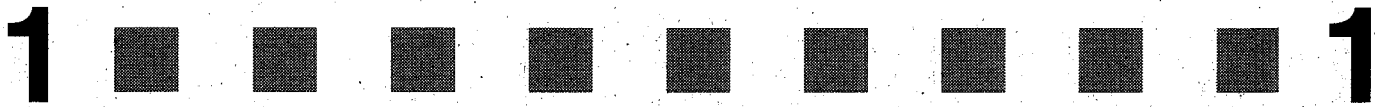
[4]

Despair, however, soon gives up on
                              ___
                               20
adaptation. Work on the project grows sporadic. You

pound a few nails, maybe patch over that hole in the

roof. You try to convince yourself things aren't so bad.
                    _____
                           21
Ankle-deep in sawdust, you wonder: Do I really need

hot water?

[5]

Eventually, you recall that you once had an

enjoyable life apart from power tools and plumbing.

You tackle the project once more, with enthusiasm—

but by a moderation of enthusiasm with experience.
   _____
                     22

Before too long in the future, you're the proud owner
       _____
               23
of a second bathroom.

[6]

You sink into despair, the house you
              _____
                24
thought you owned has turned on its master. Worse yet,

there's no going back; the old hot water pipes have

been ripped out, and a jagged, four-foot hole in the roof

has turned into an unplanned and precarious skylight.
_____
    25

[7]

[26] Take a long look at your shiny new

bathroom, settle into an easy chair, and enjoy a
              _____
                         27
well-deserved rest. You might want to watch a little televi-

sion. If so, keep the remote control handy. When one of

20. F. NO CHANGE
    G. away
    H. out of
    J. way to

21. A. NO CHANGE
    B. convince, yourself
    C. convince yourself,
    D. convince yourself;

22. F. NO CHANGE
    G. experience has moderated with enthusiasm.
    H. with the experience of moderating enthusiasm.
   J. with enthusiasm moderated by experience.

23. A. NO CHANGE
    B. you know it, you're soon
    C. too long, you're shortly
    D. too long, you're

24. F. NO CHANGE
    G. despair. The
    H. despair the
    J. despair and the

25. A. NO CHANGE
    B. was turning
    C. turned
    D. would have turned

26. Which of the following sentences offers the best intro-
    duction to Paragraph 7?
    F. One bathroom had been quite enough.
    G. Television might help you to relax.
    H. Satisfaction is something to think about when
       remodeling.
    J. When satisfaction arrives, savor it.

27. A. NO CHANGE
    B. settling into an easy chair and enjoying
    C. you settle into an easy chair and enjoy
    D. settling into an easy chair, you enjoy
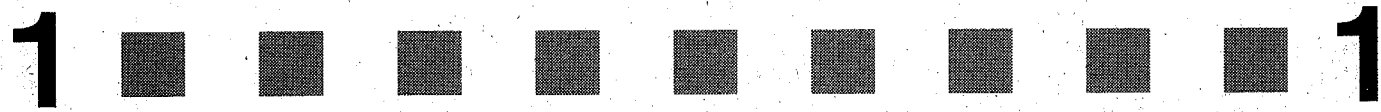
those home-improvement shows come on, you'll want to
                                    ___
                                    28

change channels quickly.

28. **F.** NO CHANGE
    G. comes
    H. are coming
    J. have come

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

---

29. What function does Paragraph 7 serve in relation to the rest of the essay?

    A. It refers back to the opening sentences of the essay, suggesting that those home-improvement shows are not wholly accurate.

    B. It indicates that the narrator has yet to learn the necessary lessons about doing home-improvement projects.

    C. It indicates that the narrator's satisfaction with the remodeling project is so great that there are thoughts of another project.

    D. It summarizes the essay's main point that those home-improvement shows really can be quite informative and helpful.

30. For the sake of the unity and coherence of the essay, Paragraph 6 should be placed:

    F. where it is now.
    G. after Paragraph 2.
    H. after Paragraph 3.
    J. after Paragraph 4.

PASSAGE III

No Satisfaction

Many people believe
   _____
          31

that today's rock music lyrics are immoral. Even
         ___
          32
parents who grew up listening to early rock tunes often

need to wear earplugs when recent songs are played.
_____
                        33
Some parents have been moved by worries about the

lyrics' influence on their children to be motivated to seek
                                   _____
                                            34

ways of restricting access of songs they deplore. However,
                  _____
                       35
our nation's devotion to freedom of speech creates a

31. Which choice would most precisely sharpen the focus of this paragraph, in keeping with the way the writer develops the argument in the rest of the essay?

    A. NO CHANGE
    B. listeners
    C. parents
    D. OMIT the underlined portion.

32. **F.** NO CHANGE
    G. that todays
    H. in which todays
    J. todays

33. Which choice best specifies the basis of some parents' claims that rock lyrics are morally objectionable?

    A. NO CHANGE
    B. admit their old favorites were pretty tame by comparison.
    C. notice the differences in recent songs.
    D. find recent songs sexist, racist, or violent.

34. **F.** NO CHANGE
    G. be motivated toward seeking
    H. have sought
    J. seek

35. **A.** NO CHANGE
    B. access by
    C. access to
    D. excess of
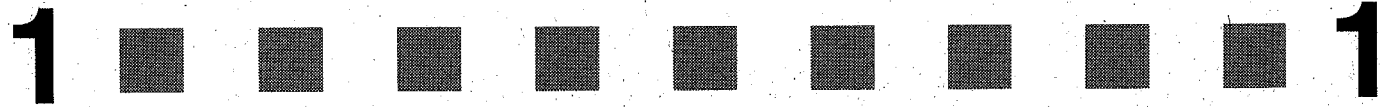
dilemma for them: censorship, even in the name of

protecting impressionable youth, is still censorship.

Music has been practiced in many nations
_____
                            36
and historical eras. One possible solution to the
_____
        36

censorship dilemma is, to rate albums as we do
_____
                    37

movies. Ratings for parents a rough guide to the
_____
            38

nature of a recording's contents. Recording companies
_____
                    39
generally are willing to rate their albums. Public officials

seem satisfied with ratings as a compromise that mutes

controversy. And recording artists remain free to sing

whatever they want.

Unfortunately, to adopt a movie-style rating

system is to ignore crucial differences between music

and movies. For one thing, when teenagers go to a theater,

we must buy tickets from a person presumably
_____
    40

responsible enough to deny them admission by exclusion
_____
                                        41
if they're underage. Unless we're willing to deputize

every sales clerk in every music store, or music ratings
_____
                                    42

won't be enforced. Moreover, rock music, more than
_____
                                43

film, expresses youthful rebellion. Label an album as
_____
44
one whose contents won't delight Mom or Dad, and

there are millions of teens who will acquire it precisely

36. F. NO CHANGE
G. Some form of music has been in use in many times and places throughout history.
H. They have practiced music in many countries and historical periods.
J. OMIT the underlined portion.

37. A. NO CHANGE
B. dilemma, is to rate albums
C. dilemma is to rate albums
D. dilemma is, to rate albums,

38. F. NO CHANGE
G. providing parents with
H. give parents
J. to give parents

39. A. NO CHANGE
B. the contents of a recording that could have been put on tape, compact disc, or record.
C. a recording's, on record, compact disc, or tape, contents.
D. the recording's contents whether it or they are on compact disc, record, or tape.

40. F. NO CHANGE
G. he or she has to
H. they have to
J. he or she have to

41. A. NO CHANGE
B. and not let them in
C. to get in
D. OMIT the underlined portion.

42. F. NO CHANGE
G. store;
H. store so
J. store, then

43. A. NO CHANGE
B. Therefore,
C. Despite this,
D. The implication being,

44. F. NO CHANGE
G. film;
H. film, which
J. film

for that reason.

Not surprisingly, there is no satisfactory method for governing rock 'n' roll. Parents can best exert responsibility for their children's listening habits by communicating their concerns to their children. By sharing their insights and values, parents and teens can discover precisely why certain kinds of lyrics provoke disagreement. The process of debate will in itself do more to promote both moral growth and mutual understanding, than any arbitrary system of restraints on what rock fans hear.

45. A. NO CHANGE
B. understanding than,
C. understanding than
D. understanding; than

PASSAGE IV

A Creative Education

N. C. Wyeth, gifted artist and illustrator, was in the early twentieth century. He is celebrated

for his vivid and haunting images by art historians, many of which continue to be published in children's

books for the young today. Yet those who knew him

believe that 49 . Because he worked at home, Wyeth was able to devote much of his time and energy to their care and instruction.

Rather than send his children to school, where, Wyeth believed, they would be "pruned to stumps, one resembling the other," during the day he often tutored them at home. The children regularly

46. F. NO CHANGE
G. Wyeth was a gifted artist and illustrator
H. Wyeth was a gifted artist, and illustrator
J. Wyeth, a gifted artist and illustrator,

47. A. NO CHANGE
B. by art historians for his vivid and haunting images,
C. for his vivid and haunting images, by art historians,
D. by art historians who consider his images vivid and haunting,

48. F. NO CHANGE
G. for young people
H. for young readers
J. OMIT the underlined portion.

49. The writer would like to link the information already presented about N. C. Wyeth to the topic discussed in the rest of the essay. Assuming all are true, which of the following completions of this sentence best achieves this effect?
A. he raised his five children in an unusual and successful way
B. he was ahead of his time in his role as the primary caregiver of his five children
C. his greatest artistic feat was in the raising of his five children
D. he spent more time with his five children than most men did in those days
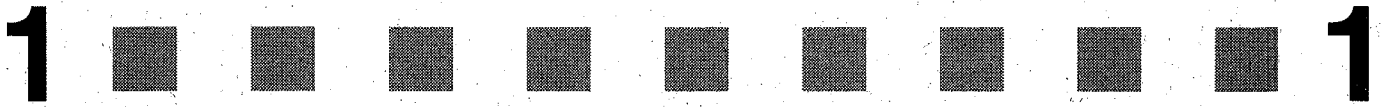
engaged in activities stimulating their curiosity
<u>50</u>
and creativity, which were designed by Wyeth. He wanted
<u>50</u>
his children to value time and to spend it productively.

Even mealtimes were educational, devoted to discussions

of current events and the works of famous writers and

artists.

The children's activities continued into the

evenings, too. Each night, Wyeth would tell stories of

elves and other magical creatures or would read from

the classics. The children's favorite stories

that they heard were those that he told while
<u>51</u>

standing at his easel sketching the giants monsters and
<u>52</u>
other fantastic creatures that inhabited his lively tales.

The children were required to do

more than sit and listen quietly through
<u>53</u>
their "lessons." They were expected to keep

scrupulously written journals containing sketches
<u>54</u>

and notes, and personal diaries they also kept. Wyeth
<u>55</u>
believed their richly textured childhood, both disciplined

and fanciful, would lay the foundation for productive
<u>56</u>
adult years.

Child-rearing provides many subtle rewards.
<u>57</u>
Wyeth raised a virtual dynasty of talent and

achievement. Three of the children became successful

---

50. F. NO CHANGE
G. that would stimulate their curiosity as designed by Wyeth.
H. designed by Wyeth, they were to stimulate their curiosity.
J. that were designed by Wyeth to stimulate their curiosity.

51. A. NO CHANGE
B. that he told
C. he told
D. OMIT the underlined portion.

52. F. NO CHANGE
G. standing at his easel, sketching the giants, monsters,
H. standing, at his easel sketching the giants, monsters
J. standing at his easel; sketching the giants, monsters,

53. A. NO CHANGE
B. more, than sit and listen quietly,
C. more than sit and listen quietly,
D. more than sit, and listen quietly

54. F. NO CHANGE
G. written journals scrupulously containing
H. journals, which were scrupulously containing written
J. scrupulously written journals, which were containing

55. A. NO CHANGE
B. also keeping personal diaries.
C. they also kept personal diaries.
D. as well as personal diaries.

56. F. NO CHANGE
G. were laying
H. had lain
J. OMIT the underlined portion.

57. Which of the choices provides the most effective introductory sentence for the essay's concluding paragraph?
A. NO CHANGE
B. Raising children is life's greatest challenge.
C. His approach seems to have worked.
D. Wyeth's drawings will not be forgotten.
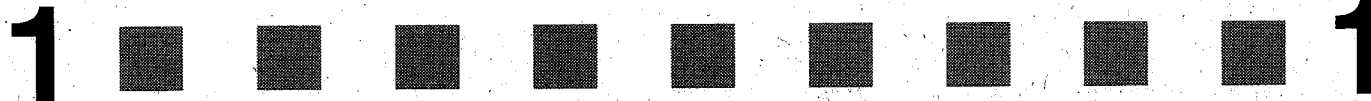
artists, another a composer, and one who was a scientist
                                        58
and inventor. All of them trace their accomplishments

to their remarkable childhood under the watchful eye of

their father's dedication and determination.
                        59

58. F. NO CHANGE
    G. the other
    H. one becoming
    J. another being

59. A. NO CHANGE
    B. the dedication and determination of their father.
    C. their dedicated and determined father.
    D. the dedicated determination of their father.

Question 60 asks about the preceding passage
as a whole.

---

60. Suppose the writer had been assigned to write a brief
    essay illustrating the influence of N. C. Wyeth's art-
    work on the subsequent artwork of his children. Would
    this essay successfully fulfill the assignment?

    F. Yes, because the essay indicates that three of his
        children became successful artists.
    G. Yes, because the essay indicates that Wyeth used
        his artwork to help foster creativity in his children.
    H. No, because the essay restricts its focus to
        Wyeth's creative child-rearing methods.
    J. No, because the essay does not suggest the types
   of images Wyeth created.

PASSAGE V

In Katmandu

The narrow cobbled streets and wide paved

avenues of Katmandu, Nepal, buzzes with the interplay
                                61
of old and new ways. In the months I spent in that

central Asian capital, I was intrigued by the culture,

having allowed local traditions and modern
    62
importations to flourish side by side.

The ancient tiered pagodas in the central

square draw both worshipers and tourists.

Merchants sell not only traditional crafts but

also high-tech European flashlights from the
                    63
temple steps. Japanese cars swerve around

61. A. NO CHANGE
    B. buzz
    C. is buzzing
    D. was buzzing

62. F. NO CHANGE
    G. allowing
    H. which has allowed
    J. that it has allowed

63. Given that all are true, which of the choices would best
    help complete an example of the "interplay" described
    in the opening paragraph?

    A. NO CHANGE
    B. religious articles of faith
    C. painted scenes of Katmandu
    D. ancient artifacts found nearby

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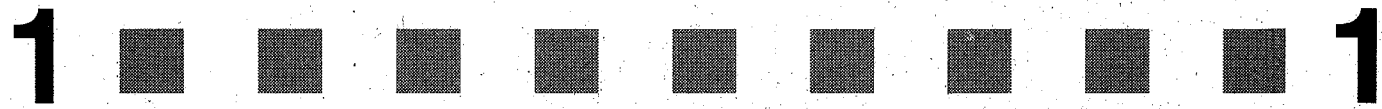
donkeys, goats, and bicycles. ⟦64⟧

[1] One afternoon, after the nourishment of some
⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
                                                    65
Texas-style barbecued chicken and apple pie, I wandered

out into the streets. [2] Garlanded with gold, masked with

dramatic makeup, and barred from walking outside, she

looked down at her changing city and my from a
                 ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
                                       66
second-floor window. [3] Suddenly aware of being

observed, I looked up into the face of a goddess—the

Living Goddess, a child revered as divine. ⟦67⟧

Finally, I saw an old-fashioned
⎯⎯⎯⎯⎯⎯⎯⎯
        68
honey-gatherer selling wild honey

he had brought down from the mountains.

Honey is a treat enjoyed in most parts of the world.
⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
                                              69
From two great pots, which were tied to a pole he

carried across his shoulders, the man poured honey into

jars. ⟦70⟧ Barefoot, and singing to advertise his honey,

he toured the city, filling even foreigners' jars with the

golden liquid.

All over the city, I saw old Nepalese ways

coexisting with modern Western ones. In a Tibetan

neighborhood, Buddhist monks in their yellow robes

64. The writer wishes to include another example of traditional Nepalese culture coexisting with modern foreign influence. Which of the following true sentences, if inserted here, would best fulfill that goal?
  F. In the fall, when Nepal's skies are clear and its weather crisp, hikers climb its famous mountains.
  G. Nepal proudly claims to be the last Hindu kingdom in the world.
  H. At Katmandu's Swayambu Temple, half-tame monkeys beg visitors for sweets.
  J. Vendors sell fiery Nepalese pastries along with American soda pop.

65. A. NO CHANGE
  B. lunching on
  C. nourishing myself by way of
  D. taking nourishment in the form of

66. F. NO CHANGE
  G. my changing city and her
  H. me and her changing city
  J. mine and hers changing city

67. Which of the following sequences of sentences makes this paragraph most logical?
  A. NO CHANGE
  B. 1, 3, 2
  C. 2, 1, 3
  D. 3, 1, 2

68. F. NO CHANGE
  G. However,
  H. To illustrate,
  J. Later that day,

69. A. NO CHANGE
  B. Honey varies in taste and color depending on several factors, including the bees' foraging area.
  C. Did you know honey was even used in the mummification process back in ancient Egypt?
  D. OMIT the underlined portion.

70. The writer wishes to add a detail to the preceding sentence that will emphasize the meeting of traditional and modern cultures. Given that all are true, which of the following replacements for *jars* would most directly accomplish this?
  F. jars his customers had that were empty.
  G. his customers' empty imported peanut butter jars.
  H. his customers' jars, which quickly filled with the sweet stuff.
  J. containers that were supplied by his customers.

played soccer with boys from a nearby neighborhood.
71

In the same district in which dentists treat their
72
patients using the latest methods, toothache sufferers

may try relieving the pain by driving a nail into a

huge hunk of wood hung for that purpose in the

public square. On Katmandus busiest commercial
73

avenue, it was under billboard advertisements for
74
toothpaste and movies, and a sidewalk artist chalked
74
heroes from the country's oldest myths. Katmandu has

been influenced by change from outside, but its
75
Nepalese culture thrives.

71. Which of the descriptions of the boys at play with monks who were dressed in traditional garb best emphasizes the central idea of the paragraph and the essay?
   A. NO CHANGE
   B. and joked with boys in the old courtyard.
   C. with boys wearing Superman T-shirts.
   D. with boys wearing traditional Nepalese caps.

72. F. NO CHANGE
   G. district, therefore,
   H. district, for example,
   J. district, on the other hand,

73. A. NO CHANGE
   B. Katmandus'
   C. Katmandu's
   D. Katmandu's most

74. F. NO CHANGE
   G. avenue, under billboard ads for toothpaste and movies, a
   H. avenue and it was under billboard ads for toothpaste and movies, a
   J. avenue that was under billboard ads for toothpaste and movies. A

75. A. NO CHANGE
   B. it's
   C. their
   D. its'

END OF TEST 1

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

MATHEMATICS TEST

60 Minutes—60 Questions

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

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

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

but some of the problems may best be done without using a calculator.

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

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

---

1. On a real number line, point S has coordinate -5 and point T has coordinate -7. What is the coordinate of the midpoint of $\overline{ST}$?

   A. -6
   B. -1
   C. 1
   D. 2
   E. 6

DO YOUR FIGURING HERE.

2. Given right triangle $\triangle ABC$ below, how many units long is $\overline{BC}$?

   F. $\sqrt{2}$
   G. 2
   H. 4
   J. $\sqrt{34}$
   K. 8
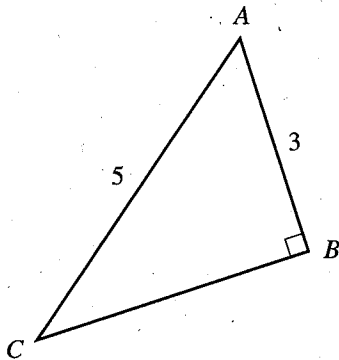
3. A Fahrenheit temperature F can be approximated by doubling the Celsius temperature C and adding 32. Which of the following expresses this approximation method?

(Note: The symbol $\approx$ means "is approximately equal to.")

A. $F \approx \frac{1}{2}C + 32$

B. $F \approx \frac{1}{2}(C + 32)$

C. $F \approx 2C + 32$

D. $F \approx 2(C + 32)$

E. $F \approx C^2 + 32$

4. Malcolm has 3 striped ties and 4 solid-colored ties hanging together in his closet. In his haste to get to his appointment, he randomly grabs 1 of these 7 ties. What is the probability the tie that Malcolm grabs is striped?

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

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

H. $\frac{1}{7}$

J. $\frac{3}{7}$

K. $\frac{4}{7}$

5. The daily totals of lunch customers served at the Sunshine Cafe last Monday through Saturday were 256, 189, 204, 179, 166, and 218. What was the average number of lunch customers served each day?

A. 1,212
B. 256
C. 202
D. 197
E. 173

6. In the figure showing $\triangle ABC$ below, line m is parallel to line n. Which one of the following angles must be congruent to $\angle x$?

F. $\angle 1$
G. $\angle 2$
H. $\angle 3$
J. $\angle 4$
K. $\angle 5$
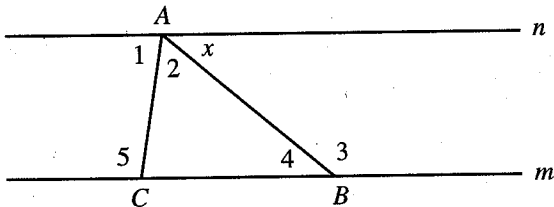
DO YOUR FIGURING HERE.
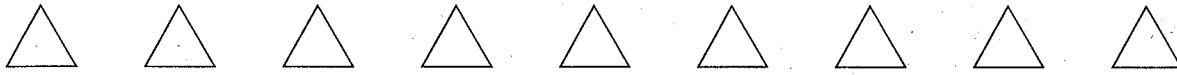
7. A package of 10 ballpoint pens is priced at $1.50 now. If the pens go on sale for 20% off the current price, what will be the sale price of the package?

   A. $0.30
   B. $0.75
   C. $1.00
   D. $1.20
   E. $1.30

8. When a triangle is isosceles, its parts are given special names, which are shown below for $\triangle ABC$ where $\overline{AB} \cong \overline{CB}$. If 2 isosceles triangles are similar, which of the following must be equal?
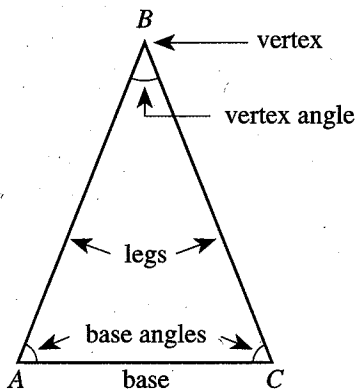
   F. Their areas
   G. Their perimeters
   H. Their heights (measured from vertex to base)
   J. The measures of all 4 legs
   K. The measures of their vertex angles

9. Sherry won a cash settlement for a suit she had filed in court. Sherry paid her lawyer 25% of the original settlement and had $12,000 remaining. How much was the original settlement?

   A. $16,000
   B. $21,000
   C. $28,000
   D. $37,000
   E. $48,000

10. Carlotta had 2 more CDs (compact discs) than Mario. Then she bought 3 CDs from Mario. Now how many more CDs does Carlotta have than Mario?

   F. −4
   G. 2
   H. 6
   J. 8
   K. 12

DO YOUR FIGURING HERE.
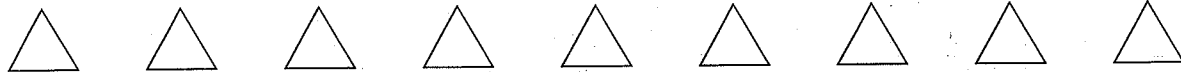
11. What is the value of $|3 - x|$ if $x = 6$?

    A. −3
    B. 3
    C. 6
    D. 9
    E. 18

DO YOUR FIGURING HERE.

12. For all x and y, $(2x - y)(x^2 + y) = ?$

    F. $2x^2 - y^2$
    G. $2x^3 - y^2$
    H. $2x^3 + xy - y^2$
    J. $2x^3 + 2xy - x^2y^2$
    K. $2x^3 - x^2y + 2xy - y^2$

13. For all x, $5 - 3(x - 4) = ?$

    A. $-3x + 17$
    B. $-3x - 7$
    C. $-3x + 1$
    D. $2x - 4$
    E. $2x - 8$

14. $(x^5)^{12}$ is equivalent to:

    F. x^{60}
    G. x^{17}
    H. $12x^7$
    J. $12x^5$
    K. $60x$

15. What is the 311th digit after the decimal point in the repeating decimal $0.\overline{51246}$?

    A. 6
    B. 5
    C. 4
    D. 2
    E. 0

16. The area of a square is 36 square inches. What is its perimeter, in inches?

    F. 6
    G. 9
    H. 12
    J. 18
    K. 24

17. What is the sum of the 2 solutions of the equation $x^2 + 2x - 15 = 0$?

- **A.** -15
- **B.** -5
- **C.** -2
- **D.** 0
- **E.** 3

18. Which of the following expressions is NOT a polynomial factor of $x^4 - 4$?

- **F.** $x^2 - 2$
- **G.** $x^2 + 2$
- **H.** $x - \sqrt{2}$
- **J.** $x + \sqrt{2}$
- **K.** $x - 2$

19. When $x = \frac{1}{2}$, what is the value of $\frac{4x - 3}{x}$?

- **A.** -20

- **B.** -2

- **C.** $-\frac{1}{2}$

- **D.** 1

- **E.** $\frac{1}{2}$

20. How many minutes would it take a train to travel 90 kilometers at a constant speed of 120 kilometers per hour?

- **F.** 30
- **G.** 40
- **H.** 45
- **J.** 80
- **K.** 90

21. The area of a trapezoid may be found by using the formula $A = \frac{1}{2}h(b_1 + b_2)$, where h is the height and b_1 and b_2 are the lengths of the parallel bases. What is the area, in square inches, of the isosceles trapezoid below?

6 inches

5 inches   5 inches

12 inches
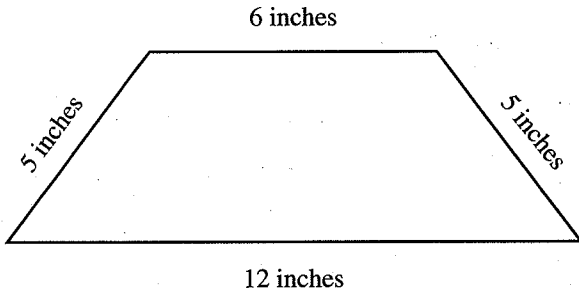
A. 15
B. 20
C. 27
D. 36
E. 45

22. For a certain quadratic equation, $ax^2 + bx + c = 0$, the 2 solutions are $x = \frac{3}{5}$ and $x = -\frac{1}{2}$. Which of the following could be factors of $ax^2 + bx + c$?

F. $(5x - 3)$ and $(2x + 1)$
G. $(5x - 1)$ and $(2x + 3)$
H. $(5x + 1)$ and $(2x - 3)$
J. $(5x + 3)$ and $(2x - 1)$
K. $(5x + 3)$ and $(2x + 1)$

23. All sides of a rhombus are the same length, as illustrated below.
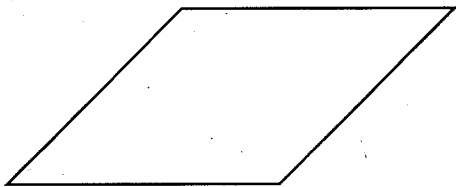
If one diagonal is 10 inches long and the other is 24 inches long, how many inches long is a side of the rhombus?

A. $\sqrt{17}$
B. $\sqrt{34}$
C. 13
D. 17
E. 26

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

24. A rectangular room that is 2 feet longer than it is wide has an area of 120 square feet. How many feet long is the room?

- **F.** 10
- **G.** 12
- **H.** 22
- **J.** 29
- **K.** 31

25. In the standard (x,y) coordinate plane, what is the slope of the line joining the points $(2,-7)$ and $(5,4)$?

- **A.** $\dfrac{1}{9}$
- **B.** $\dfrac{3}{11}$
- **C.** 1
- **D.** $\dfrac{11}{3}$
- **E.** 9

26. What is the center of the circle with equation $(x-2)^2 + (y+2)^2 = 2$ in the standard (x,y) coordinate plane?

- **F.** $(-\sqrt{2},\sqrt{2})$
- **G.** $(-2,2)$
- **H.** $(\sqrt{2},-\sqrt{2})$
- **J.** $(2,-2)$
- **K.** $(2,2)$

27. The *domain* of a function f is the set of all values of x for which $f(x)$ is defined. One of the following sets is the domain for the function graphed below. Which set is that domain?
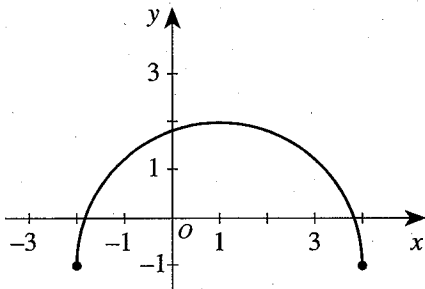
- **A.** $\{-2, -1, 0, 1, 2, 3, 4\}$
- **B.** $\{-1, 0, 1, 2\}$
- **C.** $\{x: -2 \leq x \leq 4\}$
- **D.** $\{x: -1 \leq x \leq 2\}$
- **E.** $\{x: -1 \leq x \leq 4\}$

28. In the standard (x,y) coordinate plane, what is the midpoint of the line segment that has endpoints $(-1,3)$ and $(2,7)$?

F. $\left(\frac{1}{2},5\right)$

G. $\left(1,\frac{9}{2}\right)$

H. $\left(\frac{3}{2},2\right)$

J. $(1,4)$

K. $(3,4)$

29. As a salesperson, Onawa travels to a variety of locations during a day. The graph shows the relationship between time and total distance traveled on a particular day. What was Onawa's average speed, in miles per hour, for the parts of the day when she was traveling from one place to another?
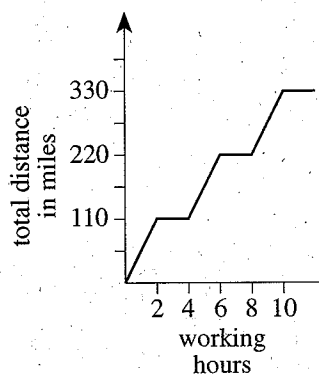
A. 19
B. 33
C. 45
D. 55
E. 110

30. If $\dfrac{x^a}{x^b} = x^3$ for all $x \neq 0$, which of the following must be true?

F. $a - b = 3$

G. $a + b = 3$

H. $a \div b = 3$

J. $a \times b = 3$

K. $\sqrt{ab} = 3$

31. In the standard (x,y) coordinate plane, what is the slope of the line given by the equation $5x - 4y = 3$?

    A. -4

    B. $-\dfrac{5}{4}$

    C. $\dfrac{4}{5}$

    D. $\dfrac{5}{4}$

    E. 5

32. Which of the following is the least common denominator for the expression below?

$$\frac{1}{13^2 \cdot 17 \cdot 23} + \frac{1}{17^2 \cdot 23} + \frac{1}{17 \cdot 23^3}$$

    F. $17 \cdot 23$
    G. $13 \cdot 17 \cdot 23$
    H. $13^2 \cdot 17 \cdot 23$
    J. $13^2 \cdot 17^2 \cdot 23^3$
    K. $13^2 \cdot 17^4 \cdot 23^5$

33. $\dfrac{1}{3} \cdot \dfrac{2}{4} \cdot \dfrac{3}{5} \cdot \dfrac{4}{6} \cdot \dfrac{5}{7} \cdot \dfrac{6}{8} \cdot \dfrac{7}{9} \cdot \dfrac{8}{10} = ?$

    A. $\dfrac{1}{90}$

    B. $\dfrac{1}{45}$

    C. $\dfrac{1}{5}$

    D. 1

   **E.** $\dfrac{9}{2}$

DO YOUR FIGURING HERE.

34. One route along flat terrain from Red Deer to Vegreville is to drive north from Red Deer to Edmonton about 150 kilometers, then, at Edmonton, to drive east for about 100 kilometers to Vegreville. If a straight, flat road existed between Red Deer and Vegreville, about how many kilometers long would it be?
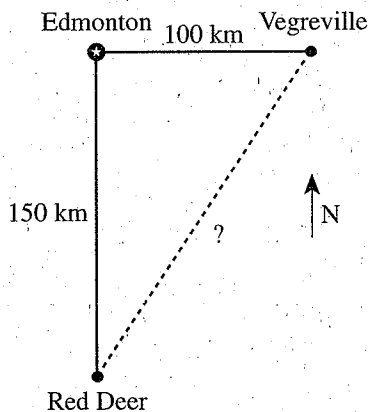

F. 250

G. $\sqrt{250}$

H. $\sqrt{12,500}$

J. $\sqrt{15,000}$

K. $\sqrt{32,500}$

35. The ellipse shown below intersects any different ellipse in, at most, how many points?
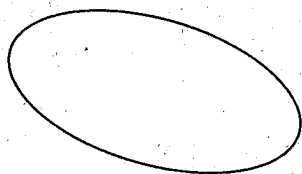
A. 1
B. 2
C. 3
D. 4
E. Infinitely many

36. The Environmental Club selects its 3 officers by first selecting the president, then the vice president, and finally the secretary. If there are 20 members who are eligible to hold office and no member can hold more than 1 office, which of the following gives the number of different possible results of the election?

F. 17^3
G. 19^3
H. 20^3
J. $19 \cdot 18 \cdot 17$
K. $20 \cdot 19 \cdot 18$

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

37. The points $A(1,1)$ and $B(5,2)$ in the standard (x,y) coordinate plane below are 2 vertices of $\triangle ABC$, which has a right angle at B. Which of the following points could be the third vertex, C ?
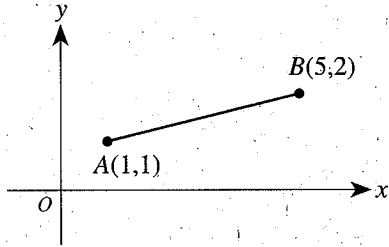
A. $(2,-3)$

B. $\left(3,\frac{3}{2}\right)$

C. $\left(\frac{7}{2},-\frac{1}{2}\right)$

D. $(4,-2)$

E. $(4,6)$

38. What value of n will satisfy the equation $0.1(n + 1,350) = n$?

F. 1,500
G. 1,485
H. 1,215
J. 150
K. 135

39. If $0° \leq x° \leq 90°$, and $2\sin^2 x° - 1 = 0$, then $x° = $?

A. 0°
B. 30°
C. 45°
D. 60°
E. 90°

40. A circular fountain with a diameter of 20 meters is to be placed entirely within a rectangular plaza, 40 by 60 meters. Bricks will be laid on the entire plaza around the fountain (but not under it), making it accessible to pedestrians. What is the approximate area, in square meters, of the plaza that will be brick?

F. 314
G. 1,256
H. 2,086
J. 2,400
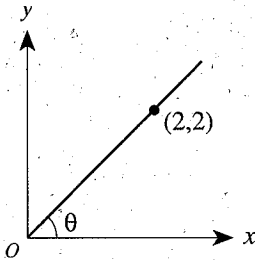K. Cannot be determined without knowing the exact placement of the fountain

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

41. In the standard (x,y) coordinate plane, which of the following lines goes through $(0,2)$ and is parallel to $y = 3x + 1$?

A. $y = -\frac{1}{3}x + 2$

B. $y = 2x + 3$

C. $y = 3x - 6$

D. $y = 3x - 2$

E. $y = 3x + 2$

42. In the figure below, $\cos\theta = ?$

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

G. $\frac{\sqrt{2}}{2}$

H. $\frac{\sqrt{3}}{2}$

J. 1

K. $\sqrt{2}$

43. Which of the following operations will produce the largest result when substituted for the blank in the expression: 2 _____ $-\frac{1}{3}$?

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

44. The value of x that will make $\frac{x}{2} + 1 = \frac{3}{4}$ a true statement lies between which of the following numbers?

F. -3 and -1
G. -1 and 0
H. 0 and 1
J. 1 and 3
K. 3 and 5

45. What is the solution set of $|2z - 1| \geq 5$?

A. $\{z: z \geq 3\}$.
B. $\{z: z \leq -2 \text{ or } z \geq 3\}$
C. $\{z: z \leq -3 \text{ or } z \geq 3\}$
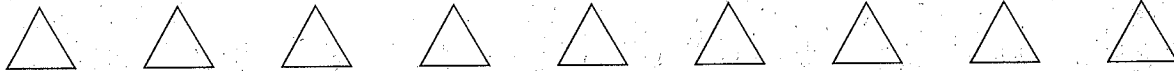D. $\{z: z \leq -4 \text{ or } z \geq 6\}$
E. $\{ \ \}$ (the empty set)

46. Whenever $\dfrac{\tan\theta}{\sin\theta}$ is defined, it is equivalent to:

F. $\cos\theta$

G. $\dfrac{1}{\cos\theta}$

H. $\dfrac{1}{\sin\theta}$

J. $\dfrac{1}{\sin^2\theta}$

K. $\dfrac{\cos\theta}{\sin^2\theta}$

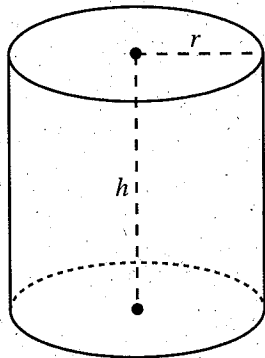**47.** If $b \neq c$, what are the real values of a that make the following inequality true?

$$\frac{ab - ac}{2b - 2c} < 0$$

A. 2 only

B. $\dfrac{1}{2}$ only

C. $-\dfrac{1}{2}$ only

D. All positive real numbers

E. All negative real numbers

48. The volume, V, of the right circular cylinder below is given by the formula $V = \pi r^2 h$, where r is the radius of the base, and h is the height of the cylinder.

If r is doubled and h is halved, the new cylinder's volume, V, will be:

F. $\frac{1}{4}$ the original volume.

G. $\frac{1}{2}$ the original volume.

H. the original volume.

J. 2 times the original volume.

K. 4 times the original volume.

49. Phuong rode his bike, mostly uphill, to visit Brad. The trip to Brad's house took t minutes. Returning home, mostly downhill, Phuong was able to travel at an average speed twice that of his trip to Brad's. Which of the following is an expression for the total number of minutes Phuong bicycled on the entire trip?

A. $\frac{t}{2}$

B. $\frac{3t}{2}$

C. $t + \frac{1}{2}$

D. $2t$

E. $3t$

50. A wheel 29 inches in diameter rolls along a line without slipping. How many inches does the wheel roll along its path in 25 revolutions?

    F.   362.5
    G.   725
    H. 1,450
    J. 210.25π
    K. 725π

DO YOUR FIGURING HERE.

51. In the figure below, a square is inscribed in a circle of radius r. What is the perpendicular distance from the center of the circle to a side of the square, in terms of r ?
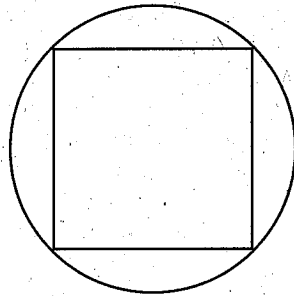
    A. $\dfrac{r}{2}$

    B. $\dfrac{r\sqrt{2}}{2}$

    C. r

    D. $r\sqrt{2}$

    E. Cannot be determined from the given information

52. The operation Δ is defined by the following:

$$a \Delta b = 3 + a + b - a \times b$$

For example, $4 \Delta 6 = 3 + 4 + 6 - 4 \times 6 = -11$. If $a \Delta b = b \Delta a$, then which of the following describes all the possible values of a and b ?

    F. They are both negative.
    G. They are both positive.
    H. They have opposite signs.
   **J.** They are equal.
    K. They can have any values.

53. To make a piece of jewelry, Aaron cuts out a circular piece of metal from a larger circular piece, as shown below. The radius of the larger circle is 2 inches. If the area of the cutout is to be the same as the area of the piece that remains, what should be the radius, in inches, of the inner circle?

A. 1

B. π

C. $\sqrt{2}$

D. $2\sqrt{2}$

E. $\pi\sqrt{2}$
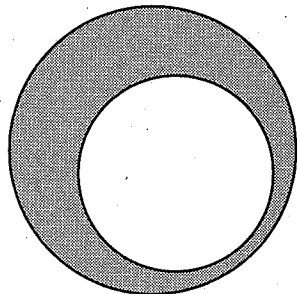
54. A movie projector emits light as shown in the top-view diagram below. To make the light projection cover the full width of a 12-foot screen without extending beyond the screen, the projector must be placed a certain distance from the screen. Assuming the screen is positioned directly in front of the projector as shown, which of the following expressions could be used to calculate the distance, in feet, from the projector to the screen?

|←——— 12′ ———→|

screen

15° 15°

?

projector
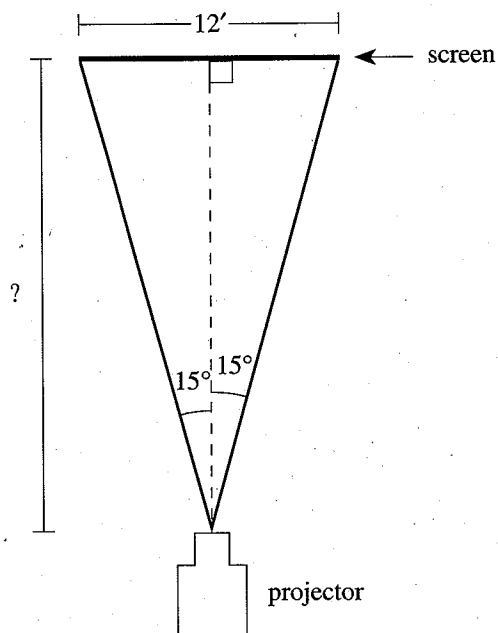
F. $\dfrac{6}{\tan 15°}$

G. $\dfrac{6}{\tan 30°}$

H. $6\tan 15°$

J. $6\tan 30°$

K. $12\tan 15°$

DO YOUR FIGURING HERE.
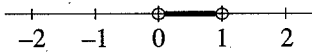
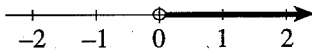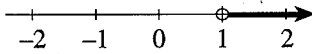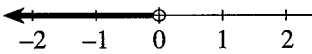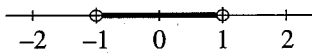55. One hot-air balloon is 10 kilometers (km) east and 3 km north of an airport tower while a second hot-air balloon at the same altitude is 2 km west and 5 km south of the same airport tower. Approximately how many kilometers separate the 2 hot-air balloons?

    A. 8.2
    B. 12
    C. 14.4
    D. 15.8
    E. 20

56. The quantity $\sqrt[n]{2^p}$ is defined when n is an integer greater than 2 and p is any nonzero real number. Which of the following is a relationship between n and p that will always make $\sqrt[n]{2^p}$ a positive *integer* ?

    F. $\frac{p}{n}$ is a positive integer

    G. $\frac{n}{p}$ is a positive integer

    H. p is greater than n

    J. n is greater than p

    K. The sum of p and n is 1

57. For real numbers a and b such that $0 < ab < a < b$, which of the following graphs represents the set of all possible values for ab ?

    A.   ⊕━━⊕ (−2 −1 0 1 2)

    B.   ⊕━━━▶ (−2 −1 0 1 2)

    C.   ⊕━━▶ (−2 −1 0 1 2)

    D.   ◀━━⊕ (−2 −1 0 1 2)

    E.   ⊕━━⊕ (−2 −1 0 1 2)

58. The Recreation Department wants to build a circular wading pool in the city park. The area available for the pool is a fenced-in rectangular region 12 meters by 18 meters. If the Recreation Department wants the wading pool to be as large as possible, and the edge of the pool must be at least 2 meters from the fence all around, how many meters long should the radius of the pool be?

- **F.** 4
- **G.** 5
- **H.** 7
- **J.** 10
- **K.** 14

59. Three distinct lines, all contained in a plane, separate the plane into distinct regions. What are all of the possible numbers of distinct regions of the plane that may be separated by any 3 such lines?

(Note: Do NOT include any of the points on the 3 lines in your count of distinct regions.)

- **A.** 3, 4, 7
- **B.** 3, 6, 7
- **C.** 4, 5, 6
- **D.** 4, 5, 7
- **E.** 4, 6, 7

60. For any real number a, the equation $|x - a| = 7$ can be thought of as meaning "the distance on the real number line from x to a is 7 units." How far apart are the 2 solutions for x ?

- **F.** a
- **G.** $2a$
- **H.** $7 + a$
- **J.** $\sqrt{7^2 + a^2}$
- **K.** 14

DO YOUR FIGURING HERE.

END OF TEST 2

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

DO NOT RETURN TO THE PREVIOUS TEST.

READING TEST

35 Minutes—40 Questions

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

Passage I

PROSE FICTION: This passage is adapted from a short story titled "Lydia McQueen" by Wilma Dykeman, from her book *The Tall Woman* (©1980 by Wilma Dykeman).

The wind was a wild dark thing plucking at the trees outside, pushing at the door and chinks of the house, then dying down still as death before another rise and rush and plunge. Listening to it, Lydia
5 McQueen waited and shrank deeper under the quilts, until the corn shucks in the mattress rustled and settled into new shapes.

She thought about the wind—like the great fine horse Papa had owned once, strong and willful with no
10 bit or stirrup that could tame it. Quiet for a spell, it would break with a sudden burst of energy. Yet her father, a gentle man, had controlled the wildness in the horse as surely and invisibly as the sun controlled the plants in her mother's garden.

15 The wind came again and she felt the pleasure of her own body-warmth. Like a seed, she felt, one of those sun-warmed seeds in the spring ground, growing, ready to give forth new life. She was aware of the dry smell of the corn shucks. Her mind went back to the
20 day she had sorted them, pulling the leaves off the hard stalk ends, working toward a soft stuffing for the mattress.

"It's a fair morning," she had said to her mother as they worked out in the yard beside the corncrib, where
25 the shucks had been stored through the winter.

"Ah, fair enough today, but dogwood winter yet to come," her mother had answered.

And after the cold spell, when dogwoods bloomed, there would be whippoorwill winter and blackberry
30 winter. The reminder cut through her joy. She set her mouth and determined to be stingy with her words the rest of the morning—until she spied the first flock of robins down in the new-cleared field. Then she cried out in pleasure again for her mother to come and see the
35 plump, neat birds, for Lydia Moore was eighteen, and chancy too, like March.

But, "You're a girl turned woman now," her mother said. "No need for such wispy ways. Anyway,

I'm of a mind they won't last long around Mark
40 McQueen."

Lydia thrust a cornhusk into the sack so sharply that one dry blade cut her middle finger. She knew her mother had wanted her to marry Ham Nelson. "Ah, Hamilton's a well-turned boy, and the Nelsons are good
45 livers," she had said when he brought Lydia home once from a sociable at the Burkes'. And Lydia had replied, remembering all that Ham had told her as they rode home that night, "Could he buy himself for what he's worth, and sell himself for what he thinks he's worth,
50 he'd be princely rich overnight."

But Sarah Moore had not smiled. Neither had she smiled when her daughter came to ask her if Mark McQueen could speak to Jesse Moore about their wedding. "With all the boys in the valley, Lydia, you
55 must choose him?"

"Mama, I didn't choose."

But she had felt helpless to explain how it was since that first day she'd seen Mark at the mill, big and dark with the strength of a mountain in him. She was
60 full of a strange confidence and beauty, and wept to herself behind the barn because she had so little confidence and was so lacking in prettiness. It was a time of days like spring, changeable and quick with life. She had no words to fit such feelings. "I didn't
65 choose, Mama. It's like I was chosen."

Her mother looked at her then, steadily.

"Living won't be easy with Mark McQueen. He's a proud man, with a restlessness on him that will be hard to still. Such a man's life can hurt his wife, be he
70 ever so in love with her or not."

For a moment she was quiet, looking no longer at her daughter but at the distant woods. Lydia heard the first spring insects humming out in the fields, heard their tiny rustling in the dry cornhusks around her
75 where the warm sun was stirring them to life. But all she saw in her mind's eye was Mark McQueen's face and his stout sun-browned arms.

"It may not seem so to you now, being a girl only and a girl in love," her mother went on, "but there's

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80 something beyond even love, for a woman as well as a
man. A body's personhood."

Her mother's gaze came back from the woods to
the yard and the house and the garden patch beyond,
and Lydia did not know how to answer all this strange
85 talk. The insects ticked and droned even louder around
them.

"Your papa has gentle ways not common to many
men. A man who is driven is not easy to live with."

The silence between them was longer than the
90 words before Lydia said softly, "I never asked for easy,
Mama."

"I know, I know." Her mother turned suddenly
back to the crib and an armful of shucks. Her voice was
muffled. "I'm beseeching the Lord to hold you in the
95 hollow of his hand."

1. When Sarah Moore says, "No need for such wispy
   ways. Anyway, I'm of a mind they won't last long
   around Mark McQueen" (lines 38–40), she is
   expressing her belief that Mark will:
   A. be incapable of love.
   B. break her daughter's spirit.
   C. treat her daughter like a child.
   D. move away from the farmland.

2. It can be reasonably inferred from their conversations
   that Sarah Moore believes her daughter will:
   F. come to her senses before it's too late.
   G. follow her mother's advice in spite of her own
      feelings.
   H. listen to her mother but marry Mark anyway.
   J. eventually grow out of the youthful desire to
      marry Mark.

3. The idea that love is not the result of rational thought
   is best exemplified by which of the following quota-
   tions from the passage?
   A. "You're a girl turned woman now."
   B. "I didn't choose."
   C. "There's something beyond even love."
   D. "A man who is driven is not easy to live with."

4. As it is used in line 31, the phrase "determined to be
   stingy with her words" most nearly means that Lydia
   wants to be:
   F. critical.
   G. sarcastic.
   H. analytical.
   J. quiet.

5. The passage makes it clear that Lydia and Mark:
   A. get married.
   B. don't really know each other.
   C. will be alienated from Lydia's family.
   D. don't know what love really is.

6. In the second paragraph (lines 8–14), Lydia compares
   her father to:
   F. the wind.
   G. a garden.
   H. a horse.
   J. the sun.

7. We may reasonably infer from details in the passage
   that the wind, Papa's horse, and Lydia are alike in that
   they are all:
   A. unpredictable and intense.
   B. strong and destructive.
   C. beautiful and free.
   D. disciplined and stubborn.

8. Lines 57–65 indicate that Lydia's feelings about
   herself are best described as:
   F. mournful.
   G. erratic.
   H. peaceful.
   J. steady.

9. It can be reasonably inferred that the corn shucks and
   the seed mentioned in the third paragraph (lines
   15–22) are symbolic, respectively, of Lydia's:
   A. memories and regrets.
   B. past and future.
   C. youth and innocence.
   D. maturity and wisdom.

10. Details in the passage suggest that Lydia's mother
    objects to her marrying Mark McQueen because she
    believes:
    F. he doesn't really love her daughter.
    G. Lydia will not be well-supported financially.
    H. he is of a lower social class than Lydia's family.
    J. Lydia will lose her independent identity.

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Passage II

SOCIAL SCIENCE: This passage is adapted from "The Sacred Turnip: Dietary Clues Gleaned from Tuber Traditions," an article by Ron Cowen that appeared in *Science News* (©1991 by Science Services, Inc.). The Blackfoot, or Sihasapa, are one of the seven groups making up the Lakota Indian tribe of the northern Great Plains.

Historians say the week-long sun dance adopted by the Blackfoot confederacy of Montana and Alberta, Canada, appears unique in that it gives special recog-
nition to a stringy, bulbous tuber called the prairie
5 turnip.

A Canadian ethnobotanist is now scrutinizing the sun dance ceremony and other Blackfoot traditions in search of clues to the prairie turnip's role in daily tribal life. So far, she says, the findings suggest that this
10 lowly legume earned its sacred status by serving as a nutritional staple.

A key part of the Blackfoot sun dance began with the transfer of a sacred bundle to a holy woman who had pledged allegiance to the sun, says Sandra Peacock
15 of the Fort Calgary (Alberta) Historic Park. The bundle held special garments and accessories, including a wooden stick and a headdress of buffalo hide adorned with feathers and pendants of weasel skins. According to tribespeople interviewed by Peacock, the stick
20 symbolized the tool used to unearth the prairie turnip, while the feathers represented turnip leaves.

A 1957 photograph of a Blackfoot holy woman depicts an additional adornment: a bunch of dried, twisted roots tied to the headdress. That photo, Peacock
25 says, sparked her fascination with the prairie turnip.

Despite its name, the prairie turnip (*Psoralea esculenta*) bears little resemblance to the more familiar root vegetable known as the turnip (*Brassica rapa*). The latter is not a legume and has a more rounded,
30 smooth appearance than the elongated, scraggly prairie turnip, which resembles a skinny potato.

Historical reports from the 1800s and early 1900s indicate that Plains Indians, especially those living in the more prairie-like regions south of Montana, once
35 cultivated *P. esculenta* widely. The three tribes of the Blackfoot confederacy—the Piegan, the Blood and the Blackfoot—do not eat the prairie turnip today, but Peacock says the plant's extensive roots in Blackfoot legend and language strongly suggest that it once
40 ranked along with buffalo meat as a vital element in their diet.

Peacock speculates that ceremonies and legends depicting the prairie turnip as sacred may reflect the tribes' need to conserve the plant, which the nomadic
45 Blackfoot may have had difficulty harvesting as they moved from one site to the next. On the other hand, she notes, Blackfoot elders recall that any tribe member could dig up the tuber without restriction.

The vegetable's prevalence in tribal customs could
50 also signify that it held special status in the Blackfoot diet, Peacock suggests.

In an attempt to determine the prairie turnip's dietary significance for the northern tribes, [researchers] analyzed the tuber's nutritional content.
55 Their study found that the leguminous tubers contain about 7 percent protein—much more than potatoes (2 percent) and nearly as much as maize (9 percent). The plant also contains a significant amount of vitamin C—17.1 milligrams per 100 grams of weight. This
60 approaches the vitamin C concentrations in fresh citrus fruits (25 to 30 mg per 100 g). Moreover, they said, a flour made by pounding dried prairie turnips (a common tribal practice) would lose little of its vitamin C during storage unless subjected to moisture.

65 The analysis suggested that *P. esculenta* "was widely and regularly used [among tribes of the northern plains] and formed a valuable food resource of high nutritional quality."

Historical accounts from Canadian expeditions in
70 1857 and 1859 describe women and children harvesting prairie turnips with fire-hardened, slightly curved digging sticks. The tuber's hard, dark skin was easily removed, exposing a white, fleshy interior. Some ate the tuber raw; others boiled it, roasted it, or dried it and
75 then crushed it to a powder.

But scientists still lack definitive evidence of the prairie turnip's place in the prehistoric Blackfoot diet, says Peacock, who maintains that most studies of tribal lifestyles have instead focused on buffalo bones, and
80 occasionally the remains of medicinal plants. To clinch the issue, she proposes that archaeologists undertake an extensive search for the burnt remains of *P. esculenta* and other pit-roasted plants, since charring would have protected them from chemical or bacterial degradation.

85 In the meantime, Peacock continues to compile ethnographic data on the prairie turnip. This summer, she hopes to witness her first sun dance and view the full costume worn by the holy woman, replete with headdress and digging stick.

11. According to the passage, the conclusions made about the nutritional content of the prairie turnips were based on a:

A. comparison of the protein and vitamin C content of the plant to that of other food crops.
B. presentation of the percentages of recommended minimum daily requirements of various vitamins and minerals contained in the plant.
C. study of the overall health of the Blackfoot people relative to that of other Plains Indians.
D. chemical analysis of the amounts of fats and sugars present in the plant.

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12. The research being undertaken by Sandra Peacock can best be summarized as a study of both the:

F. prairie turnip (*Psoralea esculenta*) and the common turnip (*Brassica rapa*).
G. current lifestyle and the traditional ways of the Blackfoot people.
H. methods of cultivation and the methods of preparing the prairie turnip for consumption.
J. botanical qualities of the prairie turnip and the ways and traditions of the Blackfoot people.

13. According to the information presented in the passage, which of the following best describes the relationship between *Psoralea esculenta* and *Brassica rapa*?

A. They are different names for the same species of turnip.
B. They are members of the turnip family, closely related in appearance but having different nutritional properties.
C. Both plants were used by the Blackfoot people as important sources of protein and vitamin C.
D. While they share the general name *turnip,* they have little else in common.

14. According to the passage, the original motivation for Sandra Peacock's research into the prairie turnip can be traced to:

F. her witnessing the week-long sun dance ceremony of the Blackfoot.
G. a photograph of the headdress used in the Blackfoot sun dance ceremony.
H. surprising information about the nutritional value of the prairie turnip.
J. a historical account of the prairie turnip being harvested by the Blackfoot.

15. As it is used in line 80, the word *clinch* most nearly means to:

A. settle or resolve.
B. stick to.
C. grasp or recognize.
D. fasten firmly on.

16. As it is depicted in the passage, the root of the prairie turnip can be best described as:

F. rounded and smooth-skinned.
G. slender and dark-skinned with a white interior.
H. bulbous with a thin, white skin.
J. stringy with a soft, purplish skin.

17. It can be inferred that the word *lowly,* as it is used in line 10, primarily refers to the prairie turnip's:

A. overwhelming abundance.
B. subpar nutritional qualities.
C. humble or commonplace appearance.
D. economical value as a food crop.

18. According to the nutritional data presented in the passage, the protein content ranking, from highest to lowest, of the following vegetables is:

F. maize, prairie turnips, potatoes.
G. potatoes, prairie turnips, maize.
H. prairie turnips, maize, potatoes.
J. prairie turnips, potatoes, maize.

19. According to the passage, *Psoralea esculenta* can be defined as all of the following EXCEPT a:

A. legume.
B. prairie turnip.
C. potato.
D. vegetable.

20. Up to the time of this article, Sandra Peacock's theory concerning the role of the prairie turnip in the traditional Blackfoot diet gained support from all of the following sources EXCEPT:

F. ethnographic data.
G. nutritional analyses.
H. archaeological evidence.
J. interviews with Blackfoot elders.

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Passage III

How was the creativity of the Black woman kept alive, year after year and century after century, when for most of the years Black people have been in America, it was a punishable crime for a Black person
5 to read or write? And the freedom to paint, to sculpt, to expand the mind with action, did not exist. Consider, if you can bear to imagine it, what might have been the result if singing, too, had been forbidden by law. Listen to the voices of Bessie Smith, Billie Holiday, Nina
10 Simone, Roberta Flack, and Aretha Franklin, among others, and imagine those voices muzzled for life.

In the late 1920's my mother ran away from home to marry my father. By the time she was twenty, she had two children and was pregnant with a third. Five
15 children later, I was born. And this is how I came to know my mother: she seemed a large, soft, loving-eyed woman who was rarely impatient in our home. Her quick, violent temper was on view only a few times a year, when she battled with the white landlord who had
20 the misfortune to suggest to her that her children did not need to go to school.

She made all the clothes we wore, even my brothers' overalls. She made all the towels and sheets we used. She spent the summers canning vegetables
25 and fruits. She spent the winter evenings making quilts enough to cover all our beds.

During the "working" day, she labored beside— not behind—my father in the fields. Her day began before sunup, and did not end until late at night. There
30 was never a moment for her to sit down, undisturbed, to unravel her own private thoughts; never a time free from interruption—by work or the noisy inquiries of her many children. And yet, it is to my mother—and all our mothers who were not famous—that I went in
35 search of the secret of what has fed that muzzled and often mutilated, but vibrant, creative spirit that the Black woman has inherited, and that pops out in wild and unlikely places to this day.

But when, you will ask, did my overworked
40 mother have time to know or care about feeding the creative spirit?

The answer is so simple that many of us have spent years discovering it. We have constantly looked high, when we should have looked high—and low.

45 For example: in the Smithsonian Institution in Washington, D.C., there hangs a quilt unlike any other in the world. In fanciful, inspired, and yet simple and identifiable figures, it portrays the story of the Crucifixion. It is considered rare, beyond price. Though
50 it follows no known pattern of quiltmaking, and though it is made of bits and pieces of worthless rags, it is obviously the work of a person of powerful imagination

and deep spiritual feeling. Below this quilt I saw a note that says it was made by "an anonymous Black woman
55 in Alabama a hundred years ago."

If we could locate this "anonymous" Black woman from Alabama, she would turn out to be one of our grandmothers—an artist who left her mark in the only medium her position in society allowed her to use.

60 And so it is, certainly, with my own mother. Unlike Ma Rainey's songs, which retained their cre- ator's name even while blasting forth from Bessie Smith's mouth, no song or poem will bear my mother's name. Yet so many of the stories that I write, that we
65 all write, are my mother's stories. Only recently did I fully realize this: that through years of listening to my mother's stories of her life, I have absorbed not only the stories themselves, but something of the manner in which she spoke, something of the urgency that
70 involved the knowledge that her stories—like her life— must be recorded.

But the telling of these stories, which came from my mother's lips as naturally as breathing, was not the only way my mother showed herself as an artist. For
75 stories, too, were subject to being distracted, to dying without conclusion. Dinners must be started, and cotton must be gathered before the big rains. The artist that was and is my mother showed itself to me only after many years. This is what I finally noticed.

80 She planted ambitious gardens—and still does— with over fifty different varieties of plants that bloom profusely from early March until late November. Before she left home for the fields, she watered her flowers, chopped up the grass, and laid out new beds.

85 Whatever she planted grew as if by magic, and her fame as a grower of flowers spread over three counties. Because of her creativity with her flowers, even my memories of poverty are seen through a screen of blooms.

21. The passage suggests that the narrator's mother, as compared to the narrator's father, performed:

A. less work in the fields.
B. more work in the fields.
C. the same work in the fields.
D. only what she could do when the children were not around.

22. It can reasonably be inferred from the second para- graph (lines 12–21) that the narrator's mother:

F. was short-tempered with her children.
G. had more children than she was able to care for.
H. placed high value on her children's education.
J. told stories to her children to express her artistic creativity.

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23. The passage primarily emphasizes the idea that the creative spirit of African American women:

 A. was destroyed by society.
 B. has endured through difficult times.
 C. was recognized years ago.
 D. has had ample outlets for expression.

24. As it is used in lines 11 and 35, the word *muzzled* most nearly means:

 F. maintained.
 G. suppressed.
 H. destroyed.
 J. cultivated.

25. The passage opens by posing a question that the rest of the passage:

 A. explores.
 B. restates.
 C. ignores.
 D. alters.

26. In the context of the passage, the phrase "We have constantly looked high, when we should have looked high—and low" (lines 43–44) suggests that:

 F. cultural historians have overlooked the importance of domestic arts.
 G. religious artists create works of powerful spiritual significance.
 H. anonymous artists have finally achieved the recognition they deserve.
 J. anthropologists conduct wide-ranging searches for clues to our collective past.

27. It can reasonably be inferred from the passage that the quilt is displayed in the Smithsonian for all of the following reasons EXCEPT that it was made:

 A. at least a hundred years ago.
 B. with great imagination.
 C. according to a unique, complex pattern.
 D. by a well-known African American quilt maker.

28. The passage indicates that the quilt referred to in lines 45–47 is the work of:

 F. an unknown person.
 G. the narrator's grandmother.
 H. a famous artist.
 J. a woman of position in society.

29. The author indicates that, when it came to storytelling, she had learned from her mother to tell stories:

 A. that always had a good ending.
 B. with sadness and anger.
 C. with great conviction.
 D. in a matter-of-fact style.

30. It can reasonably be inferred from the passage's last sentence that when the author thinks of her childhood, the memory of her mother's flowers makes her feel:

 F. less pained.
 G. more ambitious.
 H. less fortunate.
 J. more bitter.

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Passage IV

In the eighteenth and nineteenth centuries, travelers in North America reported seeing armies of squirrels, sometimes numbering in the thousands, making their way across fields, forests, and rivers.
5 These movements continued to amaze and appall the citizenry until the squirrels' habitat, deciduous forest, was greatly reduced in the late 1800s.

The gray squirrels' migrations were undoubtedly a response to changes in their food supply. Their species
10 evolved in a virtual ocean of food trees—the primeval deciduous forest that once covered the North American continent from the Atlantic Ocean to the Mississippi River. The annual changes in the squirrels' diet must have been much the same then as they are now. In the
15 spring, squirrels eat tree buds, tree flowers, and early seeds, such as maple samaras. These provide energy and key nutrients, such as calcium and sodium. But by midsummer, food is scarce, and by late July, the squirrels lose weight, resorting to such inferior foods as
20 mushrooms. With the coming of fall, however, the mainstay of the squirrels' diet—acorns and other nuts—appears.

But even when the forests were at their most extensive, and oaks and hickories in seemingly endless
25 supply, the fall harvest was unpredictable. Oaks and hickories produce huge crops of acorns and nuts, but only at odd intervals. During some autumns, often those following a late spring frost, which may kill the trees' flowers, there is virtually no seed crop at all. Compiling
30 information from newspapers and travelers' accounts, A. W. Schorger showed how squirrel migrations correlated with years of poor seed production. His work, published in 1949, showed that other species were also affected by the trees' crop failure; in acorn-poor years,
35 for example, newspapers reported free-running hogs starving to death in the forest.

Innumerable changes in the North American landscape eventually brought an end to the great squirrel migrations, although an occasional small
40 exodus has been observed in the twentieth century. The gray squirrel is still, however, very much affected by fluctuations in nut crops.

As a rule, tree squirrels keep alive from fall until spring by eating stored foods, while ground squirrels
45 hibernate. (Some squirrels, such as the eastern chipmunk, do both.) But some tree squirrels have an easier time of it than others. Those that live in evergreen forests, such as the red squirrel of eastern and northern forests and the chickaree of western forests, generally
50 gather pine cones and hoard them near their nests. Such pine cones may not be abundant every year, but if cut green and stored in a moist spot, they may last several years. But gray and fox squirrels must replace their stored food supplies every year, for acorns and nuts

55 germinate the same year they are buried. When trees fail to produce many nuts, these squirrels' reproductive success, as well as survival itself, is jeopardized.

Given the gray squirrel's life-and-death dependence on stored food, its manner of storing may seem
60 oddly inefficient. Most food-storing mammals maintain either a single larder or a mix of central larder and many spread-out smaller caches. Eastern chipmunks, for example, keep a large underground store in their burrows and, as this is depleted, turn to scattered sur-
65 face stores to replenish it. The gray squirrel's habit of burying each nut separately—called scatter-hoarding—seems cumbersome. Why does this squirrel avoid putting all its "eggs" in one basket?

Christopher Smith, of the University of Kansas,
70 has suggested that the distribution of nuts and acorns and competition from other seed eaters force gray squirrels to scatter-hoard. Because gray squirrels may not know which trees will produce a big crop, the argument goes, each squirrel must forage over a large area
75 each year. Such a large area cannot be exclusive, as other squirrels inevitably arrive to harvest seeds from the masting trees. For that matter, even small areas cannot be defended against an influx of competing squirrels, so the only chance is to cover a lot of terri-
80 tory.

Support for this theory comes from Hélèn Lair, of the University of Laval, who observed red squirrels in Quebec and found that they put food in larders only when it was abundant and easily harvested from an area
85 small enough to be subsequently defended. Otherwise, they acted like gray squirrels, scattering many small, hidden, undefended caches.

31. The author likens gray squirrels of the eighteenth and nineteenth centuries to "armies" in line 2 because these animals:

   A. struggled to survive when food was scarce.
   B. defended their territories against invaders.
   C. stored their supplies in underground caches.
   D. traveled in large groups.

32. The author calls the gray squirrel's method of storing food "oddly inefficient" in line 60 because these squirrels:

   F. migrate across fields and forests in search of food.
   G. bury each of their nuts in a separate hole.
   H. often cannot remember where their food is buried.
   J. keep an underground store of food.

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33. The passage indicates that unlike tree squirrels, ground squirrels generally do NOT depend on stored food because ground squirrels:

A. eat foods that germinate.
B. have a more varied diet.
C. live in more abundant areas.
D. tend to hibernate.

34. According to Christopher Smith, the gray squirrel's method of storing food is a response to:

F. abundant crops of nuts and acorns in small areas.
G. searching for food over a small area each year.
H. competition for food and uneven nut distribution.
J. the frequent influx of migrating squirrels.

35. It may be reasonably inferred that the author argues that squirrels living in evergreen forests may "have an easier time of it" (lines 46–47) because:

A. pine cones are more abundant.
B. pine cones can be stored for years.
C. these squirrels generally hibernate.
D. these areas have less competition for food.

36. The passage indicates that the results of the studies done by Christopher Smith and Hélèn Lair were:

F. favorable.
G. inconclusive.
H. contradictory.
J. consistent.

37. What does the passage state eventually brought an end to the great squirrel migrations?

A. The end of nut crop fluctuations
B. A reduction of deciduous forests
C. The ability of squirrels to keep a central larder.
D. An increase in acorn and nut production

38. The passage indicates that during the twentieth century squirrel migrations have been:

F. frequent given the increase in harvest unpredictability.
G. unnecessary due to a stabilized food supply.
H. appalling and amazing to the North American citizenry.
J. occasional and on a smaller scale than in previous centuries.

39. The passage indicates that if trees produce no seed crop in autumn, a likely cause is that:

A. competition for food was fierce that year.
B. premature winter temperatures caused tree damage.
C. the landscape was changed immensely.
D. a late spring frost had killed the trees' flowers.

40. The author of the passage suggests that, as compared to recent nut harvests, nut harvests in the eighteenth and nineteenth centuries were:

F. generally abundant.
G. virtually nonexistent.
H. similarly unpredictable.
J. increasingly extensive.

END OF TEST 3

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

DO NOT RETURN TO A PREVIOUS TEST.

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, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

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

Passage I

Marble, which can be used to make buildings, is composed mostly of *calcium carbonate*. Marble is *corroded* (broken down) by air pollutants such as *fly ash, nitric acid,* and *sulfuric acid.*

• Fly ash contains corrosive materials.

• Nitric acid, produced when *nitrogen dioxide* reacts with water, reacts with calcium carbonate to form *calcium nitrate.*

• Sulfuric acid, produced when *sulfur dioxide* reacts with air and water, reacts with calcium carbonate to form *calcium sulfate.*

A scientist studied marble corrosion.

Experiment 1

The scientist measured the *initial mass* of 4 samples from the same piece of marble. Each sample had a surface area of 24 square centimeters (cm^2). The scientist placed each sample in a separate container and added an acid solution (acid and water) with an acid concentration of either 30 parts per million (ppm) or 100 ppm. After 24 hours, the scientist removed each sample, scraped off the calcium nitrate or calcium sulfate, and measured the *final mass* of the sample. The scientist determined the mass of marble lost from each sample, in milligrams (mg), as shown in Table 1.

	Acid		Mass of marble lost (mg)
Marble sample	type	concentration (ppm)	
1	sulfuric acid	30	10.9
2		100	56.2
3	nitric acid	30	4.0
4		100	4.3

Table 1

Experiment 2

The scientist obtained marble samples from buildings of different ages. The outer surface of each sample had a gray crust of calcium sulfate, calcium nitrate, and fly ash. The concentrations of calcium sulfate and calcium nitrate in the crust were determined, as shown in Table 2.

Marble sample	Age of building (years)	Calcium sulfate concentration (ppm)	Calcium nitrate concentration (ppm)
5	7	30	3
6	50	200	10
7	100	375	15
8	200	400	16

Table 2

1. According to the information in the passage, a sample of marble from which of the following buildings would be expected to have the greatest concentration of calcium nitrate on its surface?

A. A 10-year-old building in a city with low levels of nitrogen dioxide in the atmosphere
B. A 10-year-old building in a city with high levels of nitrogen dioxide in the atmosphere
C. A 25-year-old building in a city with low levels of nitrogen dioxide in the atmosphere
D. A 25-year-old building in a city with high levels of nitrogen dioxide in the atmosphere

2. In Experiment 1, which of the following factors was the *same* for all 4 marble samples?

   F. Type of acid used
   G. Concentration of acid used
   H. Initial surface area of the sample
   J. Final mass of the sample

3. A comparison of the results for Samples 1 and 3 supports the hypothesis that marble corrodes more quickly when exposed to:

   A. sulfuric acid than when exposed to nitric acid.
   B. nitric acid than when exposed to sulfuric acid.
   C. sulfuric acid with a concentration of 30 ppm than sulfuric acid with a concentration of 100 ppm.
   D. nitric acid with a concentration of 30 ppm than nitric acid with a concentration of 100 ppm.

4. In Experiment 1, if the scientist had added nitric acid with a concentration of 50 ppm to a sample of marble with a surface area of 24 cm^2, approximately how much marble would have been lost after 24 hours?

   F. 3.0 mg
   G. 4.1 mg
   H. 4.5 mg
   J. 8.4 mg

5. If the scientist were to repeat Experiment 1, but break every sample of marble into 4 pieces to increase the surface area exposed to the acid, how would the mass of marble lost most likely be affected?

   A. The mass of marble lost would decrease for all 4 samples.
   B. The mass of marble lost would decrease for Samples 1 and 2 and increase for Samples 3 and 4.
   C. The mass of marble lost would stay the same for all 4 samples.
   D. The mass of marble lost would increase for all 4 samples.

6. According to the passage, if a scientist wants to study the effect of nitrogen dioxide on marble corrosion, the scientist should measure the amount of which of the following substances on the surface of the marble?

   F. Fly ash
   G. Sulfuric acid
   H. Calcium sulfate
   J. Calcium nitrate

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Passage II

Hydrocarbons contain carbon (C) and hydrogen (H) atoms joined by chemical bonds (which are represented in chemical notation by short straight lines). The carbon atoms are bonded to each other to form linear, branched, or cyclic structures (examples are presented in Table 1). The boiling points of these hydrocarbons were measured and listed in Table 2, and their *densities* (ratio of mass to volume) are listed in Table 3.

		Table 1		
Number of carbon atoms	Name	Structure		
		linear	branched	cyclic
3	propane	H_3C—CH_2—CH_3	none	H_2C—CH_2 $\backslash/$ CH_2
4	butane	H_3C—CH_2—CH_2—CH_3	H_3C—CH—CH_3 | CH_3	H_2C—CH_2 | | H_2C—CH_2
5	pentane	H_3C—CH_2—CH_2—CH_2—CH_3	H_3C—CH—CH_2—CH_3 | CH_3	H_2C—CH_2 | | H_2C CH_2 $\backslash/$ CH_2
6	hexane	H_3C—CH_2—CH_2—CH_2—CH_2—CH_3	H_3C—CH—CH_2—CH_2—CH_3 | CH_3	CH_2 $/\backslash$ H_2C CH_2 | | H_2C CH_2 $\backslash/$ CH_2
7	heptane	H_3C—CH_2—CH_2—CH_2—CH_2—CH_2—CH_3	H_3C—CH—CH_2—CH_2—CH_2—CH_3 | CH_3	H_2C—CH_2 | | H_2C CH_2 | | H_2C CH_2 $\backslash/$ CH_2

Table 2			
Number of carbon atoms	Boiling point (°C)		
	linear	branched	cyclic
3	−42	none	−33
4	0	−12	12
5	36	28	49
6	69	60	81
7	98	90	118

Table 3			
Number of carbon atoms	Density (g/cm^3)		
	linear	branched	cyclic
3	0.59	none	0.72
4	0.60	0.55	0.73
5	0.63	0.62	0.75
6	0.66	0.65	0.78
7	0.68	0.68	0.81

7. According to Table 2, by approximately how many degrees does the boiling point of a linear hydrocarbon differ from that of a branched hydrocarbon with the same number of carbon atoms?

A. 5° C
B. 10° C
C. 20° C
D. 30° C

8. According to Tables 1 and 3, which hydrocarbon has the lowest density?

F. Linear propane
G. Branched butane
H. Branched pentane
J. Cyclic heptane

9. For each type of structure, what is the relationship between the number of carbon atoms to the boiling point and density? As the number of carbon atoms increases, the boiling point:

A. increases but the density decreases.
B. decreases but the density increases.
C. decreases and the density decreases.
D. increases and the density increases.

10. According to Table 3, how do the structures of butanes (4 carbon atoms) correspond to their density?

F. The cyclic butane has a higher density than the linear and the linear has a higher density than the branched.
G. The cyclic butane has a higher density than the branched and the branched has a higher density than the linear.
H. The branched butane has a higher density than the linear and the linear has a higher density than the cyclic.
J. The branched butane has a higher density than the cyclic and the cyclic has a higher density than the linear.

11. Which hydrocarbons in Table 2 are gases at 10° C ?

A. All the linear, branched, and cyclic hydrocarbons containing at least 5 carbon atoms
B. The cyclic butane plus all the linear, branched, and cyclic hydrocarbons containing at least 5 carbon atoms
C. The linear and cyclic propanes and the linear, branched, and cyclic butanes
D. The linear and cyclic propanes and the linear and branched butanes

Passage III

When an object falls from a low altitude to Earth and gravity is the only force acting upon it, the object will have an acceleration of 9.8 meters/second^2 (m/sec^2).

Using a stopwatch that is accurate to the nearest 0.01 sec, students measured the times for 2 spheres to fall to Earth and used these times to calculate the spheres' acceleration.

Experiment 1

The students measured the times required for a 200 g wooden sphere and a 50 g plastic sphere to fall 2.5 m to Earth. The spheres had equal radii. (Note: A sphere's surface area is proportional to its radius squared; its volume is proportional to its radius cubed.) The results are shown in Table 1.

Table 1		
	Measured time of fall (sec)	
Trial	wooden sphere	plastic sphere
1	0.75	0.81
2	0.85	0.84
3	0.80	0.78
4	0.79	0.78
5	0.77	0.80

For the wooden and plastic spheres, the average times were 0.79 sec and 0.80 sec, respectively, and the average accelerations were 8.0 m/sec^2 and 7.8 m/sec^2, respectively.

Experiment 2

The procedure in Experiment 1 was repeated for the same spheres falling 9.7 m to Earth. The results are given in Table 2.

Table 2		
	Measured time of fall (sec)	
Trial	wooden sphere	plastic sphere
6	1.50	1.56
7	1.42	1.65
8	1.42	1.58
9	1.51	1.62
10	1.45	1.61

For the wooden and plastic spheres, the average measured times were 1.46 sec and 1.60 sec, respectively, and the average accelerations were 9.1 m/sec^2 and 7.6 m/sec^2, respectively.

Experiment 3

The students tested the hypothesis that the stopwatch was not being started or stopped at the right moments. Using the stopwatch and a blinking light that flashed every 1.00 sec, the students measured the time interval between adjacent flashes. The results are given in Table 3.

Table 3	
Trial	Time interval (sec)
11	1.04
12	1.08
13	1.00
14	1.10
15	1.06

The average time recorded in Table 3 was 1.06 sec.

12. In Experiment 1, if an additional trial were conducted using the plastic sphere, the sphere's measured time of fall would most likely be nearest:

F. 0.70 sec.
G. 0.75 sec.
H. 0.80 sec.
J. 0.90 sec.

13. The students conducted Experiments 1 and 2 using both the wooden sphere and the plastic sphere, most likely to determine if a sphere's acceleration was affected by its composition and its:

A. mass.
B. radius.
C. surface area.
D. volume.

14. The best evidence that the spheres were influenced by forces in addition to gravity was that, during each experiment, the observed values of acceleration were:

    F. equal to 9.8 m/sec^2.
    G. significantly lower than 9.8 m/sec^2.
    H. significantly higher than 9.8 m/sec^2.
    J. the same for spheres having different masses.

15. Based on the passage, if the plastic sphere is dropped 5 times from an altitude of 1 m, the average measured time of fall will most likely be:

    A. less than 0.80 sec.
    B. approximately 0.85 sec.
    C. approximately 1.06 sec.
    D. more than 1.60 sec.

16. In Experiment 1, should the students have used a stopwatch that was accurate to the nearest second, and why?

    F. Yes, because both spheres took approximately 1 sec to fall to Earth.
    G. Yes, because in 1 sec the spheres would have fallen farther than they did in Experiment 1.
    H. No, because the spheres took less than 1 sec to fall to Earth.
    J. No, because in 1 sec the spheres would not have fallen as far as they did in Experiment 1.

17. To show that a sphere's acceleration is affected by air resistance, in addition to the experiments in the passage, which of the following experiments can be performed?

    A. In a sealed vacuum chamber containing no air, the spheres are dropped from heights of 2.5 m and 9.7 m.
    B. In a sealed vacuum chamber containing no air, the spheres are rolled across the floor at a speed of 9.8 m/sec.
    C. In a sealed vacuum chamber containing air at atmospheric pressure, the spheres are dropped from heights of 2.5 m and 9.7 m.
    D. In a sealed vacuum chamber containing air at atmospheric pressure, the spheres are rolled across the floor at a speed of 9.8 m/sec.

## Passage IV

All multicellular animals can be grouped within the subkingdom *Metazoa*. Most metazoans are *bilaterally symmetrical* (they have right and left halves that are nearly identical). Biologists agree that metazoans evolved from *protozoans* (single-celled organisms) over 600 million years ago, but they do not agree on how this occurred. Three theories are presented.

Cellularization Theory

Some biologists believe that metazoans evolved from *multinucleated protozoans* (protozoans with many nuclei). Separate cells formed when membranes developed between adjacent nuclei. Later, *cilia* (hairlike structures), used for movement, grew from each cell. These ciliated protozoan ancestors then evolved into aquatic, bilaterally symmetrical metazoans similar to modern flatworms. Later, other metazoans evolved from these flatworm-like creatures (see Figure 1).
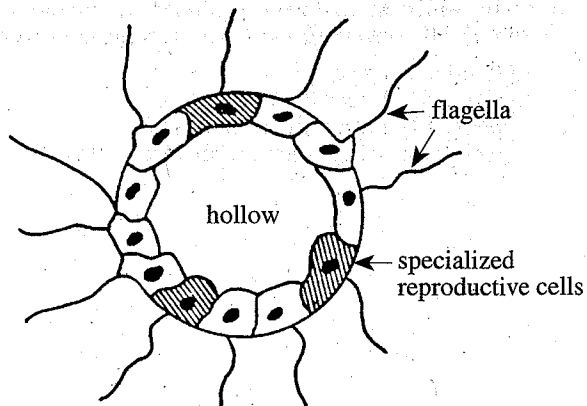
ancestral protozoan colony
(cross section through spherical colony)
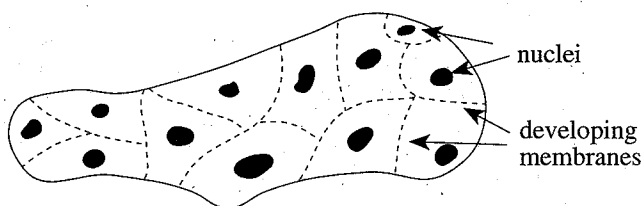
ancestral multinucleated protozoan
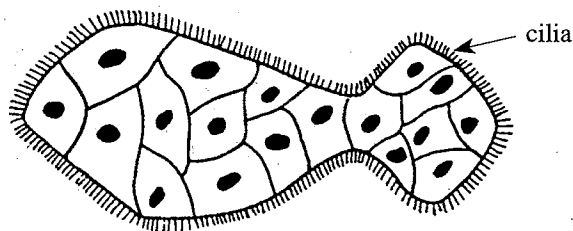
first flatworm-type metazoan

Figure 1

first jellyfish-like metazoan

Figure 2

Colonial Theory

Other biologists suggest that many protozoans grouped together into a hollow ball, or colony. This colony evolved into the first metazoan. Each cell in the colony had a *flagellum* (movable tail) for movement. Initially, some of these cells were better suited for reproduction, and these became the reproductive cells of the metazoan. The first metazoans were aquatic, flagellated, *radially symmetrical* organisms (body parts arranged symmetrically around a central point, as in modern jellyfish). All later metazoans evolved from these jellyfish-like organisms (see Figure 2).

Separate Line Theory

Proponents of this theory argue that 2 separate protozoan lines led to metazoans. Radially symmetrical metazoans evolved from flagellated, colonial protozoans. Bilaterally symmetrical metazoans evolved from ciliated, multinucleated protozoans. The first metazoans of each group were jellyfish-like creatures and flatworm-like creatures, respectively. The 2 protozoan groups were only distantly related to each other, and the evolution of aquatic metazoans from the 2 protozoan groups occurred independently and at different times.

18. The Cellularization Theory does NOT include the hypothesis that the earliest metazoans were:

    F. ciliated.
    G. aquatic.
    H. hollow.
    J. bilaterally symmetrical.

19. The development of which of the following characteristics is addressed in the passage by the Colonial Theory, but NOT by the Cellularization Theory?

    A. Body symmetry
    B. Ciliated tissues
    C. Multinucleated cells
    D. Reproductive cells

20. Supporters of all 3 theories would agree with the conclusion that the first metazoans:

    F. evolved from protozoans.
    G. are older than the first protozoans.
    H. had many nuclei in each cell.
    J. were radially symmetrical.

21. Which of the following types of organisms, if present today, would provide the most support for the Colonial Theory?

    A. Flagellated protozoans living in dense colonies
    B. Flagellated protozoans living in hollow colonies
    C. Ciliated protozoans living in dense colonies
    D. Ciliated protozoans living in hollow colonies

22. Assuming that the Separate Line Theory is correct, which of the following conclusions can be made about modern hydras, which are radially symmetrical, and modern flukes, which are bilaterally symmetrical?

    F. Hydras and flukes evolved from radially symmetrical metazoans.
    G. Hydras and flukes evolved from bilaterally symmetrical metazoans.
    H. Hydras and flukes are more closely related to each other than to protozoans.
    J. Hydras and flukes are only distantly related through protozoans.

23. Which of the following questions is raised by the Colonial Theory, but is NOT answered in the passage?

    A. Why did the first flatworm-like metazoans have cilia?
    B. Why were some colonial cells better suited for reproduction?
    C. How could 2 lines of metazoans evolve from protozoans?
    D. How were multinucleated cells transformed into cells with single nuclei?

24. Proponents of all 3 theories would agree with which of the following conclusions about the evolution of metazoans?

    F. Bilaterally and radially symmetrical metazoans evolved at different times.
    G. The first metazoan was a jellyfish-like organism with flagella.
    H. The evolution of metazoans led to the extinction of protozoans.
    J. Bilaterally symmetrical metazoans are more advanced than radially symmetrical metazoans.

Passage V

Rain causes *sediment runoff* (erosion) of rangelands, which is affected by vegetation (grasses, leaves, and branches) and animal trampling. Scientists conducted 2 experiments using identical-sized plots of soil with slight slopes. Two soils that differed primarily in their sand content were used. Soil 1 contained 60% sand and Soil 2 contained 25% sand. Sprinklers simulated rainfall. It was noted that rain first collected in soil depressions, such as hoofprints, then overflowed and eroded the soil. Sediment runoff was measured at the bases of the plots in grams per square meter (g/m^2), following 1 hour of rain.

Experiment 1

Vegetation cover was simulated using window screens having various mesh sizes. The larger the number of mesh squares per inch, the greater the simulated vegetation cover. One plot was left uncovered, and screens of various mesh sizes covered the other plots. Table 1 shows the sediment runoff from each plot.

Table 1				
	Sediment runoff (g/m^2) with a simulated vegetation cover of:			
Soil	0%	30%	50%	70%
1	947	751	572	492
2	378	331	291	200

Experiment 2

Animal trampling was simulated by leading a 500-kilogram (kg) cow back and forth over 2 plots of each soil type until 30% of one and 60% of the other were covered with hoofprints. One additional plot of each soil type was left untrampled. Rainfall was simulated as in Experiment 1. The depth of water stored in hoofprints, in centimeters (cm), is shown in Table 2, and the sediment runoff produced by erosion is shown in Table 3.

Table 2			
	Water stored (cm) in hoofprints on plot that was:		
Soil	0% trampled	30% trampled	60% trampled
1	0	0.67	0.79
2	0	0.65	0.52

Table 3			
	Sediment runoff (g/m^2) from plot that was:		
Soil	0% trampled	30% trampled	60% trampled
1	347	730	801
2	282	307	311

Tables adapted from G. Gifford and M. Savabi, "Effects of Simulated Canopy Cover and Animal Disturbances on Rill and Interrill Erosion." ©1989 by the American Water Resources Association.

25. Which of the following assumptions was made in the design of Experiment 1 ?

   A. All soils will show the same amount of erosion under the same conditions.
   B. Sprinklers do not adequately simulate actual rainfall.
   C. Grass is more important than trees in preventing sediment runoff.
   D. Simulated plant cover acts like natural plant cover in protecting the soil from erosion by water.

26. According to the results of Experiments 1 and 2, one can minimize soil erosion by:

   F. increasing plant cover, decreasing the amount of trampling, and using land covered with Soil 2.
   G. increasing plant cover, decreasing the amount of trampling, and using land covered with Soil 1.
   H. decreasing plant cover, increasing the amount of trampling, and using land covered with Soil 2.
   J. decreasing plant cover, decreasing the amount of trampling, and using land covered with either soil.

27. If Experiment 2 were repeated using a different soil containing 50% sand, which of the following would be the expected water storage in soil hoofprints and sediment runoff on a plot subjected to 60% trampling?

   A. 0.89 cm water stored; 321 g/m^2 sediment runoff
   B. 0.86 cm water stored; 932 g/m^2 sediment runoff
   C. 0.71 cm water stored; 700 g/m^2 sediment runoff
   D. 0.56 cm water stored; 295 g/m^2 sediment runoff

28. In Experiment 2, after 30% trampling, water stored in the two soil types was similar, but sediment runoff was not. Which of the following statements is the most likely explanation for the difference in sediment runoff?

   F. Water stored in hoofprints has a significant relationship to sediment runoff.
   G. Water in soil hoofprints evaporates before it can erode the soil.
   H. A soil with a smaller percent sand is less susceptible to erosion than soil with a higher percent sand.
   J. Sediment carried from higher areas of the plot is trapped in soil depressions.

29. If Experiment 1 were repeated using a soil containing 50% sand with 70% plant cover, which of the following would be closest to the expected sediment runoff from this soil?

   A. 175 g/m^2
   B. 200 g/m^2
   C. 425 g/m^2
   D. 500 g/m^2

30. To further investigate the effect of vegetation cover on soil erosion, the scientists should repeat Experiment:

   F. 1, using plots planted with different grasses.
   G. 1, using no window screen.
   H. 2, using plots with steeper slopes.
   J. 2, using a third soil type.

Passage VI

Earth's atmosphere consists of various gases and suspended liquid and solid matter. The atmosphere can be divided into layers based on air temperature and/or composition. Figure 1 shows the layers of the atmosphere, the altitude of the layer boundaries, in kilometers (km), and the air pressure, in millibars (mb), at those boundaries. Figure 2 shows the average air temperature, in degrees Celsius (°C), in *arctic* (cold) and *tropical* (warm) air masses at various altitudes. Table 1 shows air pressure and temperature readings from weather instruments carried into the stratosphere by balloons on 2 separate days.

Key
——— arctic air mass
– – – – tropical air mass

Figure 2

Layer of atmosphere	Altitude (km)	Air pressure (mb)
thermosphere / ionosphere — F2	500	1.9×10^{-9}
	400	3.4×10^{-9}
F1	190	3.4×10^{-7}
E	140	3.4×10^{-6}
D	90	3.4×10^{-3}
80 km / mesosphere	72	3.4×10^{-2}
chemosphere / ozonosphere	50	3.4
stratosphere	32	10.8
	11	301
troposphere / surface	0	1,013

Figure 1

(Note: Figure is NOT drawn to scale.)
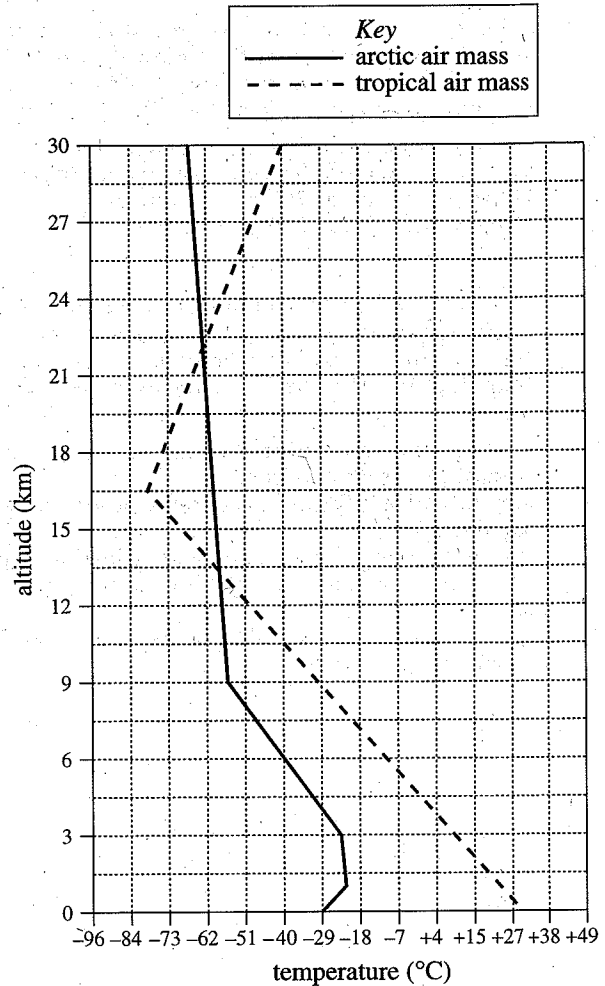
Table 1			
		Temperature (°C) readings on:	
Air pressure (mb)	Altitude (km)	Day 1	Day 2
1,000	0	2	25
900	0.9	0	15
700	2.9	−17	6
600	4.2	−25	−2
500	5.6	−30	−12
400	7.2	−40	−20
300	9.1	−50	−32
250	11.4	−50	−50
200	13.7	−48	−58

GO ON TO THE NEXT PAGE.

31. According to Figure 2, at approximately which of the following altitudes would a weather instrument measuring air temperature be unable to distinguish between tropical and arctic air masses?

    A. 12.0 km
    B. 13.5 km
    C. 15.5 km
    D. 16.5 km

32. According to Figure 1, several atmospheric layers overlap one another. Which of the following describes atmospheric layers that share part of a common altitude range?

    F. Stratosphere and mesosphere
    G. Stratosphere and thermosphere
    H. Mesosphere and thermosphere
    J. Mesosphere and chemosphere

33. According to Figure 1 and Table 1, if the weather instruments rose above 13.7 km, the air pressure would most likely:

    A. increase to more than 1,000 mb.
    B. stay at 200 mb.
    C. decrease to less than 200 mb.
    D. decrease to 1,000 mb.

34. According to Figure 1, a weather instrument reading an air pressure of 5 mb is most likely in which of the following layers?

    F. Troposphere
    G. Ozonosphere
    H. Mesosphere
    J. Ionosphere

35. According to Table 1, which of the following statements best describes the relationship between altitude and air temperature?

    A. The air temperature decreased with increasing altitude on Day 1 only.
    B. The air temperature increased with increasing altitude on Day 1 only.
    C. The air temperature decreased with increasing altitude on Day 2 only.
    D. The air temperature increased with increasing altitude on Day 2 only.

Passage VII

Bacteria, fungi, and viruses (*microorganisms*) cause diseases and infections. *Disinfectants* are chemical agents used on inanimate objects to kill or inhibit the growth of microorganisms. *Antiseptics* are chemical agents used on the skin to kill or inhibit the growth of microorganisms. Several groups of disinfectants and antiseptics are depicted in Table 1.

Table 1				
Groups	Chemical agent	Effective against	Mechanism of action	Preferred use
Alcohols	ethanol	bacteria, fungi, some viruses	cell disruption, stops protein function, cleansing	skin antiseptic and thermometer disinfectant
Halogen	iodines	bacteria, fungi, viruses	stops protein function	skin antiseptic
Halogen	chlorines	bacteria, fungi, viruses	stops protein function	water disinfectant; disinfectant used on dairy, restaurant, and household equipment
Heavy metals	Mercurochrome, Merthiolate	bacteria	stops protein function	skin antiseptic
Quaternary ammonium compounds	Zephiran, Cepacol	bacteria, fungi, viruses	cell disruption, stops protein function	skin antiseptic; disinfectant for instruments, utensils, and rubber goods
Detergents	soaps, surfactants	bacteria, fungi, viruses	cleansing, decreases surface tension	mechanical removal of microorganisms by scrubbing

The chemical agents that make up disinfectants and antiseptics can be dissolved either in alcohol (forming a *tincture*) or water (forming an *aqueous solution*). The effectiveness of a variety of antiseptics against the normal microbial flora of the skin is shown in Figure 1.
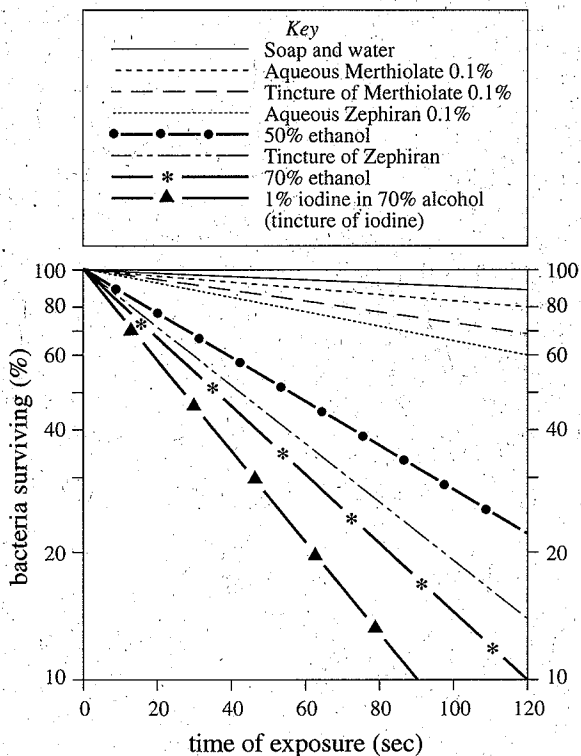

Figure 1

Table and Figure adapted from Tortora, Funke, and Case, *Microbiology: An Introduction.* ©1989 by The Benjamin/Cummings Publishing Company.

36. According to the passage, the most effective antiseptic against microorganisms is the one that leaves the:

F. lowest percentage of surviving microorganisms in the longest time of exposure.

G. lowest percentage of surviving microorganisms in the shortest time of exposure.

H. highest percentage of surviving microorganisms in the longest time of exposure.

J. highest percentage of surviving microorganisms in the shortest time of exposure.

37. According to the information presented in Table 1 and Figure 1, what conclusion about the use of alcohol as an antiseptic may be reached?

A. Dissolving chemical agents in alcohol increases their effectiveness as antiseptics.

B. Using 70% ethanol is ineffective as an antiseptic.

C. Increasing the concentration of alcohol decreases its overall effectiveness as an antiseptic.

D. The mechanism of action for alcohol as an antiseptic is unknown.

38. Is the statement "tinctures are more effective against microorganisms than aqueous solutions of the same antiseptic" supported by the information presented in Figure 1, and why?

F. Yes, because tincture of Merthiolate is more effective against microorganisms than is aqueous Merthiolate.

G. Yes, because 70% ethanol is more effective against microorganisms than is tincture of Zephiran.

H. No, because soap and water is more effective against microorganisms than is 50% ethanol.

J. No, because aqueous Zephiran is more effective against microorganisms than is tincture of Zephiran.

39. After you thoroughly wash your hands with plain soap and water for 2 minutes, your hands probably carry:

A. the same number of bacteria as before; most are dead.

B. the same number of bacteria as before; most are still alive.

C. fewer bacteria than before; most are dead.

D. fewer bacteria than before; most are still alive.

40. According to Figure 1, if a researcher prepared a disinfectant solution of 60% alcohol, the time of exposure required to kill 90% of the bacteria present would be:

F. 60 to 80 sec.

G. 80 to 100 sec.

H. 100 to 120 sec.

J. greater than 120 sec.

END OF TEST 4

STOP! DO NOT RETURN TO ANY OTHER TEST.

Scoring Your Sample Test

How to Score the Sample Test

The remainder of this booklet provides scoring keys and score conversion tables. Follow the instructions below and on the following pages to score the sample test and review your performance.

Raw Scores

The number of questions you answered correctly on each test and in each subscore area is your *raw score*. Because there are many forms of the ACT, each containing different questions, some forms will be slightly easier (and some slightly harder) than others. A raw score of 57 on one form of the English Test, for example, may be about as difficult to earn as a raw score of 60 on another form of that test.

To compute your raw scores, check your answers with the scoring keys on pages 55–57. Count the number of correct answers for each of the four tests and seven subscore areas, and enter the numbers in the blanks provided on those pages. These numbers are your raw scores on the tests and subscore areas.

Scale Scores

To adjust for the small differences that occur among different forms of the ACT, the raw scores for tests and subscore areas are converted into *scale scores*. Scale scores are printed on the reports sent to you and your college and scholarship choices.

When your raw scores are converted into scale scores, it becomes possible to compare your scores with those of examinees who completed different test forms. For example, a scale score of 26 on the English Test has the same meaning regardless of the form of the ACT on which it is based.

To determine the scale scores corresponding to your raw scores on the sample test, use the score conversion tables on pages 58–59. The table on page 58 shows the raw-to-scale score conversions for the total tests, and the table on page 59 shows the raw-to-scale score conversions for the subscore areas. Because each form of the ACT Assessment is unique, each form has somewhat different conversion tables. Consequently, these tables provide only approximations of the raw-to-scale score conversions that would apply if a different form of the ACT Assessment were taken. Therefore, the scale scores obtained from the sample test would not be expected to match precisely the scale scores received from a national administration of the ACT Assessment.

Percent At or Below

Even scale scores don't tell the whole story of your test performance. You may want to know how your scores compare to the scores of other students who take the ACT.

The norms table (Table 3 on page 60) enables you to compare your scores on the sample test with the scores of recent high school graduates who tested as sophomores, juniors, or seniors. The numbers reported in Table 3 are cumulative percents. A cumulative percent is the percent of students who scored *at* or *below* a given score. For example, a Composite score of 20 has a cumulative percent of 49. This means that 49% of the ACT-tested high school students had a Composite score of 20 or lower.

Remember that your scores and percent at or below on the sample tests are only *estimates* of the scores that you will obtain on an actual form of the ACT. Test scores are only one indicator of your level of academic knowledge and skills. Consider your scores in connection with your grades, your performance in outside activities, and your career interests.

Reviewing Your Performance on the Sample Test

After you have determined your scale scores and cumulative percents, consider the following as you evaluate how you did on the sample test:

- Did you run out of time before you completed a test? Perhaps you need to adjust the way you used your time in responding to the questions. It is to your advantage to answer every question and pace yourself so that you can do so.

- Did you spend too much time trying to understand the directions to the tests? If so, read the directions for each test again thoroughly. The directions in the sample test are exactly like the directions that will appear in your test booklet on the test day. Make sure you understand them now, so you won't have to spend too much time studying them when you take the actual test.

- Review the questions that you missed. Did you select a response that was an incomplete answer or that did not directly respond to the question being asked? Try to figure out what you overlooked in answering the questions.

- Did a particular type of question confuse you? Did the questions you missed come from a particular subscore area? In reviewing your responses to the sample test, check to see whether a particular type of question or a particular subscore area was more difficult for you or took more of your time.

Scoring Keys for the ACT Sample Test Booklet 0255C

Use the scoring key for each test to score your answer document for the sample test. Mark a "1" in the blank for each question you answered correctly. Add up the numbers in each subscore area and enter the total number correct for each subscore area in the blanks provided. Also enter the total number correct for each test in the blanks provided. The total number correct for each test is the sum of the number correct in each subscore area.

Test 1: English—Scoring Key

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

Number Correct (Raw Score) for:	
Usage/Mechanics (UM) Subscore Area	___ (40)
Rhetorical Skills (RH) Subscore Area	___ (35)
Total Number Correct for English Test (UM + RH)	___ (75)

* UM = Usage/Mechanics
RH = Rhetorical Skills

TABLE 1
Procedures Used to Obtain Scale Scores from Raw Scores

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

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scale scores and divide the sum by 4. If the resulting number ends in a fraction, round it off to the nearest whole number. (Round down any fraction less than one-half; round up any fraction that is one-half or more.) Enter this number in the blank. This is your Composite score. The highest possible Composite score is 36. The lowest possible Composite score is 1.

ACT Test 0255C   **Your Scale Score**

English   _____

Mathematics   _____

Reading   _____

Science Reasoning   _____

Sum of scores   _____

Composite score (sum ÷ 4)   _____

NOTE: If you left a test completely blank and marked no items, do not list a scale score for that test. If any test was completely blank, do not calculate a Composite score. Now go to page 59 and use the table to convert raw scores on the subscore areas to scale subscores.

Scale Score	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science Reasoning	Scale Score
36	75	60	39-40	40	36
35	—	59	38	39	35
34	74	58	37	—	34
33	73	57	36	38	33
32	72	54-56	35	37	32
31	70-71	52-53	34	36	31
30	68-69	50-51	33	—	30
29	66-67	48-49	32	35	29
28	64-65	46-47	31	33-34	28
27	61-63	44-45	30	32	27
26	58-60	42-43	29	31	26
25	56-57	40-41	27-28	29-30	25
24	53-55	37-39	26	28	24
23	51-52	35-36	25	26-27	23
22	49-50	33-34	23-24	24-25	22
21	46-48	31-32	22	23	21
20	43-45	29-30	20-21	21-22	20
19	41-42	26-28	19	19-20	19
18	38-40	23-25	18	17-18	18
17	35-37	20-22	17	14-16	17
16	32-34	17-19	16	13	16
15	29-31	14-16	15	11-12	15
14	26-28	12-13	13-14	09-10	14
13	24-25	10-11	12	08	13
12	22-23	08-09	10-11	06-07	12
11	20-21	06-07	08-09	05	11
10	17-19	05	07	—	10
9	14-16	04	06	04	9
8	12-13	—	05	03	8
7	10-11	03	—	02	7
6	08-09	02	04	—	6
5	06-07	—	03	—	5
4	05	—	—	01	4
3	03-04	01	02	—	3
2	02	—	01	—	2
1	00-01	00	00	00	1

TABLE 2
Procedures Used to Obtain Scale Subscores from Raw Scores

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

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

ACT Test 0255C   **Your Scale Subscore**

English

    Usage/Mechanics (UM) _____

    Rhetorical Skills (RH) _____

Mathematics

    Pre-Algebra/Elementary Algebra (EA) _____

    Intermed. Algebra/Coord. Geometry (AG) _____

    Plane Geometry/Trigonometry (GT) _____

Reading

    Social Studies/Sciences (SS) _____

    Arts/Literature (AL) _____

Raw Scores

Scale Subscore	Test 1 English		Test 2 Mathematics			Test 3 Reading		Scale Subscore
	Usage/ Mechanics	Rhetorical Skills	Pre-Algebra/ Elem. Algebra	Inter. Algebra/ Coord. Geometry	Plane Geometry/ Trigonometry	Social Studies/ Sciences	Arts/ Literature	
18	39-40	35	24	18	18	20	19-20	18
17	37-38	34	23	17	17	19	17-18	17
16	36	33	22	16	15-16	18	16	16
15	33-35	31-32	21	14-15	14	16-17	15	15
14	31-32	29-30	19-20	13	12-13	15	14	14
13	29-30	26-28	18	11-12	11	14	13	13
12	28	24-25	16-17	10	10	13	12	12
11	26-27	21-23	15	08-09	08-09	11-12	11	11
10	24-25	19-20	13-14	07	07	10	10	10
9	22-23	16-18	11-12	05-06	05-06	09	09	9
8	19-21	13-15	09-10	04	04	07-08	08	8
7	17-18	11-12	07-08	—	03	06	—	7
6	14-16	09-10	05-06	03	—	05	06-07	6
5	11-13	07-08	04	02	02	04	05	5
4	09-10	05-06	03	—	—	03	04	4
3	06-08	04	02	01	01	02	03	3
2	04-05	02-03	01	—	—	01	02	2
1	00-03	00-01	00	00	00	00	00-01	1

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ENGLISH

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

MATH

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

ACT ANSWERS 0255C

READING

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

ACT ANSWERS 0255C

SCIENCE

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