

Practice Test

FORM 9652C

The ACT Assessment

DIRECTIONS

This booklet contains tests in English, Mathematics, Reading, and Science Reasoning. These tests measure skills and abilities highly related to high school coursework 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 sheet, 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 sheet 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 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 sheet 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.

DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO.

Useful Links:

ACT Online Practice Tests: <http://www.crackact.com/act/all-tests.html>

✓ **ACT English Tests:** <http://www.crackact.com/act/english/>

✓ **ACT Math Tests:** <http://www.crackact.com/act/math/>

✓ **ACT Reading Tests:** <http://www.crackact.com/act/reading/>

✓ **ACT Science Tests:** <http://www.crackact.com/act/science/>

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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 each underlined part. You are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose "NO CHANGE."

You will also find questions about a section of the passage, or about the passage as a whole. These questions

do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, 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. You cannot determine most answers without reading several sentences beyond the question. Be sure that you have read far enough ahead each time you choose an alternative.

PASSAGE I

"Krazy Kat" Comics

[1]

The most widely acclaimed comic strip of all time is probably George Herriman's "Krazy Kat" and Herriman was a staff artist for William Randolph Hearst's New York *Journal*. Hearst was convinced that comic strips were the key to luring readers away from Joseph Pulitzer's New York *World*. Therefore, he hired the most talented and innovative comic strip artists he could find. Between 1907 and 1910, George Herriman developed several strips for Hearst. One of them "The Family Upstairs," included an inch-tall mini-strip across the bottom about a cat and a mouse who lived in the house's woodwork. After three years, this mini-strip blossomed into "Krazy Kat," the first comic strip to obtain true cult status.

[2]

[1] On the surface it's premise was simple.

[2] Ignatz Mouse devoted his life to bombarding Krazy Kat with bricks. [3] Krazy Kat, blinded by

1. A. NO CHANGE
B. Kat."
C. Kat,"
D. Kat" but

2. F. NO CHANGE
G. However,
H. Nevertheless,
J. In spite of this,

3. A. NO CHANGE
B. Between the years stretching from 1907 to
C. Between the years extending from 1907 and
D. It was during the years extending from 1907 to

4. F. NO CHANGE
G. them "The Family Upstairs" included
H. them, "The Family Upstairs," included
J. them "The Family Upstairs" included,

5. A. NO CHANGE
B. (Place after *this* and correct capitalization)
C. (Place after *comic strip* and correct capitalization)
D. (Place after *cult* and correct capitalization)

6. F. NO CHANGE
G. there
H. its
J. its'



love, believed this to be an expression of affection.

[4] Inevitable Mouse succeeded in his efforts “to
 Krease that Kat’s bean with a brick.” [5] Ignatz was
 then arrested and jailed by Offissa Pupp, who was,
 in turn, in love with, Krazy Kat. [6] “Krazy
 Kat” featured Ignatz Mouse, Krazy Kat, and Offissa
 Pupp. 9

[3]

The stories take place in a surreal landscape. In
 the background, strangely shaped stone monoliths
 and aberrant alien plants mutate from panel to panel.
 They appear and disappear as though they controlled
 their own fates. While the characters seem destined
 to endlessly reenact the same scenario. But the strip
 was able to transcend the limitations of its genre: it
 spoke lyrically of the human condition. 11

[4]

“Krazy Kat” didn’t capture the public’s imagination
 immediately, but Hearst loved the strip and ignored
 his editor’s advice to cancel it. Instead, he moved it
 to the arts and drama section, where it attracted a
 devoted following. A following included President
 Woodrow Wilson and the poet e. e. cummings. “His
 life is warped with fancy, woofed with dreams,” Offissa
 Pupp said of the Kat. The strip was too.

7. A. NO CHANGE
 B. Inevitably as he was,
 C. Most inevitable,
 D. Inevitably,
8. F. NO CHANGE
 G. love with;
 H. love with
 J. love, with
9. For the sake of unity and coherence, Sentence 6 should be placed:
 A. where it is now.
 B. before Sentence 1.
 C. before Sentence 3.
 D. before Sentence 4.
10. F. NO CHANGE
 G. fates? While
 H. fates! While
 J. fates, while
11. Given that all are true, which of the following sentences would be the most appropriate introductory sentence for Paragraph 3?
 A. “Krazy Kat” does not appear in newspapers today.
 B. “Krazy Kat” was more complex and sophisticated than its premise indicates.
 C. There are no plans, at the moment, to make a movie based on the comic strip “Krazy Kat.”
 D. When a word in “Krazy Kat” began with the letter *c*, Herriman almost always replaced it with the letter *k*, though this was not the case for words beginning with *ch*.
12. F. NO CHANGE
 G. This following included
 H. It then included
 J. OMIT the underlined portion.
13. A. NO CHANGE
 B. additionally was.
 C. was in addition.
 D. in addition, too.



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

14. The writer wishes to add the following information to the essay:

Hearst paid handsomely to get the best cartoonist because, as one of his artists later explained, "Hearst didn't care about money, all he cared about was beating Pulitzer."

The new sentence would most logically be placed in Paragraph:

- F. 1, because Paragraph 1 discusses Hearst's competition with Pulitzer.
- G. 2, because Paragraph 2 introduces the reader to the main characters in "Krazy Kat."
- H. 2, because Paragraph 2 describes the basic premise of "Krazy Kat."
- J. 3, because Paragraph 3 anticipates the mention in Paragraph 4 of Hearst's commitment to "Krazy Kat" and his refusal to cancel it even though it was initially unpopular.

15. Suppose the writer had been assigned to write a brief essay describing the impact newspaper sales wars had on the evolution of the comic strip. Would this essay successfully fulfill the assignment?

- A. Yes, because the essay focuses on how talented and innovative comic-strip artists improved sales for the two competitors.
- B. Yes, because the essay focuses on the innovative and sophisticated techniques that George Heriman utilized in "Krazy Kat."
- C. No, because the essay focuses on "Krazy Kat," and the competition for the newspaper market is only mentioned in passing.
- D. No, because the essay focuses on the failure of "Krazy Kat" to initially attract a wide readership.

PASSAGE II

Valet Parking

[1]

Eating out in Los Angeles is expensive, so food ¹⁶ accounts for only a portion of the cost. Those who dine out are often required to utilize the valet parking services offered by many restaurants. In some instances, the price of parking can equal the price of a modest meal.

[2]

Valet parking is widespread in Los Angeles. Although not every restaurant in Los Angeles offers this service, somewhere in the city every type of restaurant do. ¹⁷ While fast-food eateries and four-star establishments may serve wildly different cuisine, and the prices apart from their respective menus may also be wildly ¹⁸

different, then each may require its patrons to pay ¹⁹

- 16. F. NO CHANGE
- G. but
- H. then
- J. thus

- 17. A. NO CHANGE
- B. had.
- C. did.
- D. does.

- 18. F. NO CHANGE
- G. of respectable
- H. on their respective
- J. as respective

- 19. A. NO CHANGE
- B. if it
- C. each may
- D. may each



for the privilege of having a total stranger park their

20

cars. 21

[3]

Restaurants typically cooperate with independently owned valet parking services. Valet parking costs can

exceed five dollars, depending on the location, if not

22

including a tip for the helpful valet.

[4]

[1] Valet parking services simply recognized this fact to cash to put themselves in position. [2] The answer

23

is simple, the city contains a huge number of well-to-do

24

residences which like to eat out often. [3] You may wonder why valet parking is such a big business in Los Angeles.

25

[4] It's said that many people actually like the idea of valet parking; for them, having someone else park their car adds to the glamour of dining out. 26

[5]

Many others, however, think that valet parking

27

is an expensive nuisance. Unfortunately for

20. Which of the alternatives most strongly supports the notion that valet parking is an impersonal phenomenon?

- F. NO CHANGE
- G. person
- H. recent acquaintance
- J. young adult

21. The writer considers adding the following sentence after Paragraph 2's second sentence:

For some reason, though, only rarely do fish places have valet parking.

The most logical reason for the writer to *reject* such an addition in this paragraph is because the sentence:

- A. does not add crucial information, and it disrupts the logical flow of the paragraph.
- B. undermines the validity of the preceding sentence since it does not single out a particular type of restaurant.
- C. adds too much of a negative emphasis to the essay.
- D. suggests that it might be less expensive to eat in a fish place than any other type of restaurant.

22. F. NO CHANGE

- G. thus
- H. not
- J. whether

23. A. NO CHANGE

- B. and put themselves into position to cash in.
- C. and themselves put into position to cash in.
- D. to put themselves into cash in position.

24. F. NO CHANGE

- G. simple the city,
- H. simple the city
- J. simple: the city

25. A. NO CHANGE

- B. residences who
- C. residents who
- D. residencies that

26. Which of the following sequences of sentences will make Paragraph 4 most logical?

- F. NO CHANGE
- G. 1, 3, 4, 2
- H. 1, 4, 2, 3
- J. 3, 2, 1, 4

27. A. NO CHANGE

- B. others however think,
- C. others, think however
- D. others, however; think



them though; parking on Los Angeles's crowded streets is often a difficult proposition. In the trendier areas, where the hot restaurants are likely to be found and where large crowds are the norm, valet parking is more than a convenience—it's almost a necessity. You either pay up or walk *too many* blocks to the restaurant at which you hope to eat. Most people pay up.

28. F. NO CHANGE
 G. their parking, though,
 H. parking them, though,
 J. them, though, parking

29. A. NO CHANGE
 B. a convenience when it's
 C. convenient—its
 D. convenient yet

Question 30 asks about the preceding passage as a whole.

30. The writer is considering adding the following parenthetical sentence to the essay:

(The hourly wage paid to valets is low; how well they live depends on the tipping behavior of patrons.)

If added, this sentence should be placed after the last sentence of Paragraph:

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

PASSAGE III

Discovering the Power of Words

[1]

Shortly after our daughter was born, my wife returned to her job, and leaving each morning for her office. I

worked at home, and it was a consequence, for the first few months of our daughter's life, I was the daytime caregiver.

[2]

Each day my daughter and I went out together to run errands. And each day brought a new lesson about the power of words. Imperceptibly, postal clerks would joke about my having been "stuck babysitting." A grocery

31. A. NO CHANGE
 B. job, leaving
 C. job; leaving
 D. job. Leaving
32. F. NO CHANGE
 G. because of which,
 H. resulting,
 J. so,

33. A. NO CHANGE
 B. Fortunately, postal
 C. Unnoticeably, postal
 D. Postal

checker may comment that Mom must have needed some
³⁴
 “beauty sleep,” and so “poor Papa” was sent out shopping.

[3]

All these people thought that my active parenting was
 odd. They assumed parenting had been foisted upon me.

What I remember most about their comments were that I
³⁵
 began to believe them and to doubt my ability to be

as good a parent than what my wife might be. Their
³⁶

assumptions and their words, appropriate or not,
³⁷
 had power.

[4]

Now that our daughter is three, I’ve noticed
 how words empower and enchant her. She listens
with an eagle eye out for subtleties, tries out the
³⁸
 power of rude words, and, in the end, takes everything

all too literally. That’s the reason which I’m disturbed
³⁹

when I hear adults tell her that. Although she might
⁴⁰
 like to run and climb with the boys now, soon she will
 want to play house with the girls.

[5]

Having grown up in the feminist era,
comments about what is appropriate behavior for girls,
⁴¹
boys, women, and men I did not now expect to hear.
⁴¹
 I must admit, though, that when *chairperson, mail*
carrier, and police officer were being pressed into the
 language to replace *chairman, mailman, and policeman,*
 I had my doubts; what I doubted was that words could

34. F. NO CHANGE
 G. may have
 H. might
 J. might have

35. A. NO CHANGE
 B. is
 C. was
 D. OMIT the underlined portion.

36. F. NO CHANGE
 G. than
 H. as
 J. OMIT the underlined portion.

37. A. NO CHANGE
 B. words appropriate or not,
 C. words, appropriate or not
 D. words appropriate or not

38. F. NO CHANGE
 G. with an eagle eye
 H. like an eagle with its famed, accurate eye
 J. OMIT the underlined portion.

39. A. NO CHANGE
 B. cause for why
 C. for which reason
 D. why

40. F. NO CHANGE
 G. her. Although,
 H. her, although,
 J. her that although

41. A. NO CHANGE
 B. comments about what is appropriate behavior for
 girls, boys, women, and men were not expected
 now.
 C. I did not now expect to hear comments about what
 is appropriate behavior for girls, boys, women,
 and men.
 D. it would be improbable and unexpected now for
 there to be comments about what is appropriate
 behavior for girls, boys, women, and men.



effect change. Yet I see now with my daughter that
⁴²
 language does change what we perceive as possible and
 appropriate. A mailman is not a woman; a mail carrier
 might well be a woman. 43

42. F. NO CHANGE
 G. Consequently,
 H. Moreover,
 J. Therefore
43. The writer wishes to conclude the essay by encouraging his readers to use language that does not restrict appropriate behavior by gender. Which of the following best accomplishes that goal?
- A. Please use good language!
 B. I hope the language we use will create possibilities, not limitations, for our children. A primary caregiver might well be a man.
 C. There, remember "Little pitchers have big ears" and today's children are the leaders of tomorrow.
 D. A primary caregiver might well be a man. Finally, therefore, I would strongly encourage you to be a good role model, because children do what we do, not what we say.

Questions 44 and 45 ask about the preceding passage as a whole.

44. The writer wishes to add the following detail to the essay:

One person actually stopped me in the street to say, "Hey, Dad, what would your wife say if she saw her baby out without a hat?"

Considering the information offered in and the focus of each of the paragraphs, one would most logically insert this sentence in Paragraph:

- F. 1, before what is now the last sentence.
 G. 2, after what is now the last sentence.
 H. 4, before the first sentence.
 J. 4, after what is now the last sentence.

45. The writer wishes to include the following observation in the essay:

They also assumed that whether by nature or through years of practice on dolls, my wife automatically knew about booties and birthmarks, burping and bonnets, whereas I automatically knew nothing.

This sentence would most logically fit:

- A. in Paragraph 1.
 B. in Paragraph 3.
 C. in Paragraph 4.
 D. before the first sentence in Paragraph 5.

PASSAGE IV

Why Collect Books?

[1]

The next time you paw through a stack of books at a garage sale, take a closer look. The novel selling, for a dime, might be worth its weight

⁴⁶

in gold. Like china dolls, and furniture and old books, are prized by collectors. Depending on its age, condition,

⁴⁷

46. F. NO CHANGE
 G. novel selling for a dime
 H. novel selling for a dime,
 J. novel, selling for a dime
47. A. NO CHANGE
 B. dolls and furniture for old books,
 C. dolls, and furniture, and old books,
 D. dolls and furniture, old books



significance, and rarity,⁴⁸ for a book that originally sold for \$2.95 might bring thousands of dollars at auction.

For the knowledgeable, sharp-eyed buyer, a pile of dusty

books are there treasure.⁵⁰

[2]

[1] Book collecting is a game anyone can play.

[2] To begin, simply decide which books interest you and then start acquiring a few titles. [3] Collectors have established imaginable markets for nearly every type of book. [4] Some⁵¹ specialize in children's literature; others devote themselves to aviation. [5] Incunabula—books produced before the sixteenth century—are among the rarest and most expensive prizes. [6] However,⁵² modern novels of literary significance offer an affordable entry

into the game. 53

48. F. NO CHANGE
G. and rarity, a
H. rarity, each
J. and rarity for a

49. A. NO CHANGE
B. But the
C. However, as a
D. Since the

50. F. NO CHANGE
G. could contain a
H. would be their
J. containing a

51. A. NO CHANGE
B. (Place after *markets*)
C. (Place after *every*)
D. (Place after *type*)

52. F. NO CHANGE
G. Although
H. Such as, for example,
J. Yes,

53. Suppose that this essay was written to introduce readers to book collecting and to encourage their participation as collectors. Would adding the following sentence after Sentence 3 in Paragraph 2 help the writer fulfill that purpose?

There are many markets out there, one for almost every sort of book you could think of.

- A. Yes, because the sentence offers highly detailed information that should be mentioned at this point in the essay.
B. Yes, because the writer apparently thinks readers of this essay could not think of many types of markets.
C. No, because the sentence might make book collecting seem like too strange an activity for most readers to enjoy.
D. No, because the sentence is largely redundant and, so, contributes little to the essay's persuasiveness.



[3]

[1] Unlike some collectibles, rare books are relatively easy to acquire. 54 [2] Garage and rummage sales

are good sources, plus their are used-book stores and sidewalk sales around college campuses. ⁵⁵ [3] Still, collectors must take care. [4] A first edition of the same book, in mint condition, commands a high price. [5] Old books are plentiful, but not all are valuable; some are worth only the dime they're selling for. [6] While your uncle's dog-eared paperback reprinting of Hemingway's *The Sun Also Rises* might be his favorite, to a serious collector of interest. [7] If the novel is signed by Hemingway

himself, your so much the better. 58

[4]

Most collectors are in the game for reasons other than profit. The hunt provides its own rewards, as does the pleasure of reading. If the books increase in value, that's all well and good. Most collectors follow one rule above all: Collect the books that you most want to read. Then an unread book has no real value, no matter what

54. Suppose the writer wanted to support the claim made in Sentence 1 about the relative ease of finding collectible books. Which of the following sentences would best fulfill that purpose?

- F. Books are lightweight, portable, and only a little dusty, which means you can carry them most places.
- G. Isn't it too much trouble to simply look through a stack of books and see what's there?
- H. Compared to one-of-a-kind paintings or gems, rare books are obtainable and affordable.
- J. Each type of collecting poses its own set of difficulties, and book collecting has many drawbacks.

55. A. NO CHANGE
B. but it's the same thing with
C. and so are
D. because of

56. F. NO CHANGE
G. their is interest.
H. it is of little interest.
J. things can be interesting.

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

58. For the sake of unity and coherence. Sentence 4 would best be placed:

- F. where it is now.
- G. before Sentence 1.
- H. before Sentence 3.
- J. before Sentence 7.

59. A. NO CHANGE
B. Although
C. After all,
D. Whenever

an auctioneer might say. 60

60. Which of the following sentences most accurately restates the point of Paragraph 4?
- F. An unopened and undamaged book is a thing of beauty.
 - G. Reading books is more important than collecting them.
 - H. Only sometimes can you judge a book by its cover.
 - J. Books that have beautiful illustrations have the greatest value to collectors.

PASSAGE V

The Hot Springs of Iceland

[1]

Although Iceland touches the Arctic Circle and⁶¹ contains many immense, permanent glaciers (Vatnajökull, for example, covers 3,125 square miles), the country is more interesting with⁶² heat. Specifically, Iceland is one of the earth's most volcanically active areas. Beneath the so-called land of ice boil thousands of hot springs heated by volcanic fires. Since⁶³ hot water serves the country well.

[2]

In 1930, it's partly⁶⁴ because its forests had been so depleted, Iceland began to develop this geothermal energy source bubbling beneath its surface. Outside of Reykjavík, Iceland's capital,⁶⁵ huge holes were bored into the earth at depths of between 450 and 2,500 feet.

Enormous pipes were bringing⁶⁶ the water to seven 250,000-gallon tanks on a hill above the city. This massively public works⁶⁷ project was not finished until 1943.

[3]

Even though the water loses some heat as it is pumped from the wells, through the pumping stations, and on to consumers, the water still arrives at faucets at a temperature of approximately 175 degrees Fahrenheit.

61. A. NO CHANGE
B. Circle; and
C. Circle—and
D. Circle, and,
62. F. NO CHANGE
G. interesting when it has
H. interesting for its
J. interested in it's
63. A. NO CHANGE
B. That is
C. Whose
D. That
64. F. NO CHANGE
G. in part
H. that's partly
J. for its part
65. A. NO CHANGE
B. Reykjavík, Icelands capital,
C. Reykjavík, Iceland's capital
D. Reykjavík Iceland's capital,
66. F. NO CHANGE
G. had brought
H. were to bring
J. will bring
67. A. NO CHANGE
B. massed public
C. massive publicity
D. massive public



[4]

[1] This hot water is used to heat homes, offices, schools, and, yes, swimming pools. [2] One would hardly expect swimming to be the national sport of a country named Iceland, because in this country heated pools are common. [3] On the coldest winter days, Icelanders regularly swim in open-air pools that need cold water added to bring the temperature *down* to 86 degrees.

[4] Thick mists rise from the pools, the water obscures.

[5]

[1] In addition to generating inexpensive and plentiful natural energy and providing hot water for the country's citizens, Iceland's volcanoes also produce some spectacular

geysers. [2] The oldest of these, Geysir, was, like Yellowstone's Old Faithful, famed for its regularity.

[3] Now it lies dormant. [4] Nearby, a younger geyser is replaced, a new offering from the boiling springs that

bring the warm heat to a land of ice. [74]

68. F. NO CHANGE
G. whereas
H. yet
J. and, in fact,

69. A. NO CHANGE
B. obscuring.
C. obscuring the water.
D. obscurant water.

70. F. NO CHANGE
G. Iceland's volcanoes
H. Iceland's volcanoes
J. Iceland's volcanoes'

71. A. NO CHANGE
B. these Geysir, was
C. these Geysir was
D. these, Geysir was,

72. F. NO CHANGE
G. has replaced it,
H. lies in replacement,
J. OMIT the underlined portion.

73. A. NO CHANGE
B. gift of
C. offering bequeathed by warmth and
D. generosity of comfortable

74. The writer wishes to add the following sentence, for emphasis, to Paragraph 4 or Paragraph 5:

You could have set your watch by it!

If added, this sentence would most logically be placed before Sentence:

- F. 3 in Paragraph 4.
G. 4 in Paragraph 4.
H. 2 in Paragraph 5.
J. 3 in Paragraph 5.



Question 75 asks about the preceding passage as a whole.

75. The writer wishes to add the following comment to the essay:

(The possibility of having to rely on foreign energy sources was not appealing.)

If added, this sentence would most logically be placed after the first sentence of Paragraph:

- A. 2.
- B. 3.
- C. 4.
- D. 5.

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. The greatest common divisor of 84, 90, and 66 (that is, the largest exact divisor of all three numbers) is:

- A. 6
- B. 12
- C. 18
- D. 36
- E. 90

2. If a circle's diameter is 5 meters, what is that circle's radius, in meters?

- F. $2\frac{1}{2}$
- G. 5
- H. $\frac{5}{2}\pi$
- J. 5π
- K. $\frac{25}{4}\pi$

3. If you've traveled x miles per hour for 3 hours, how many miles have you traveled?

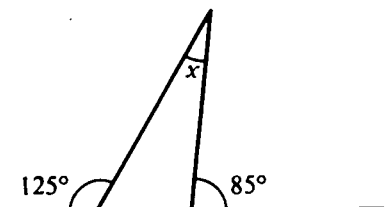
- A. $\frac{3}{x}$
- B. $\frac{x}{3}$
- C. $3x$
- D. $60x$
- E. $180x$

4. $(2ab^2)^3(3a^2b)^2$ is equivalent to:

- F. $6a^5b^7$
- G. $6a^{12}b^{12}$
- H. $36a^7b^7$
- J. $72a^7b^8$
- K. $6^5a^{12}b^{12}$

5. In the figure below, what is the value of x ?

- A. 5°
- B. 30°
- C. 40°
- D. 55°
- E. 60°



6. What is the solution value of x for the equation $3(x-2) = 9x-5$?

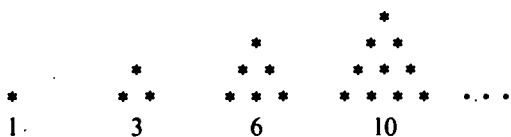
- F. -6
- G. $-\frac{11}{12}$
- H. $-\frac{1}{6}$
- J. $\frac{1}{2}$
- K. 1



7. An architect is drawing a scaled blueprint of an apartment building that is to be 150 feet wide and 200 feet long. On the drawing, if the building is 48 inches long, how many inches wide should it be?

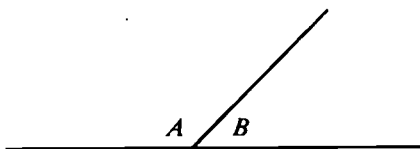
A. $12\frac{1}{2}$
 B. 16
 C. $16\frac{2}{3}$
 D. 36
 E. $37\frac{1}{2}$

8. What is the 7th term in this sequence of "triangular" numbers, defined by the figures below: 1, 3, 6, 10, ... ?



F. 7
 G. 22
 H. 25
 J. 28
 K. 40

9. One angle, $\angle A$, has 3 times the measure of its supplement, $\angle B$, as depicted below. What is the degree measure of $\angle A$?



A. $112\frac{1}{2}^\circ$
 B. 120°
 C. 135°
 D. 150°
 E. $157\frac{1}{2}^\circ$

10. A weight lifter can lift 510 pounds. His goal is to improve by 20% during the next year. How many pounds does he want to be able to lift 1 year from now?

F. 512
 G. 530
 H. 602
 J. 610
 K. 612

11. If $x = 4$ and $y = 5$, what is the value of

$$\frac{x^2(y^2 - 2)(x - y)}{x(y - x)} ?$$

A. 92
 B. -70
 C. -92
 D. -100
 E. -368

12. If a bag contains 5 blue marbles, 4 red marbles, and 3 green marbles, what is the probability that a marble randomly picked from the bag will be red?

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

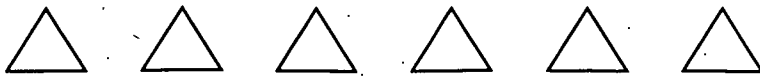
13. What is the value of $\frac{2^2 - 1^4}{3^2 - 1^5}$?

A. 0
 B. $\frac{3}{10}$
 C. $\frac{3}{8}$
 D. $\frac{1}{2}$
 E. $\frac{5}{8}$

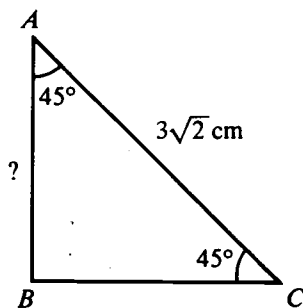
14. If $m = 4$, $n = -3$, and $p = 2$, what is the value of

$$\frac{mp - mn}{p^3} ?$$

F. -0.50
 G. -0.25
 H. 0.40
 J. 1.25
 K. 2.50



15. In $\triangle ABC$ below, the measures of $\angle A$ and $\angle C$ are each 45° , and \overline{AC} is $3\sqrt{2}$ centimeters (cm) long. How long, in centimeters, is \overline{AB} ?



- A. 1
B. 3
C. $\sqrt{2}$
D. $\sqrt{6}$
E. $\frac{3\sqrt{2}}{2}$

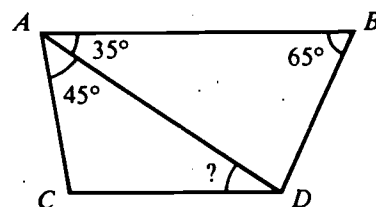
16. For all x and y , what is the sum of $2x^2y - 3xy^2$ and $-3x^2y + 2xy^2$?

- F. $x^2y + xy^2$
G. $x^2y - xy^2$
H. $-x^2y - xy^2$
J. $-x^2y + xy^2$
K. $-x^4y^2 - x^2y^4$

17. What is the area, in square inches, of a triangle with a height of 3 inches and a base 1 inch long?

- A. $\frac{3}{2}$
B. $\sqrt{3}$
C. 3
D. 4
E. 6

18. In the figure below, \overline{AB} is parallel to \overline{CD} . What is the measure of $\angle ADC$?



- F. 35°
G. 40°
H. 45°
J. 65°
K. 80°

19. If $kx + k = 0$, and $k > 1$, then $x = ?$

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

20. "Snake-eyes" occur when you roll two 1's on a pair of regular, 6-sided dice numbered from 1 to 6. On any roll, what is the probability of rolling snake-eyes?

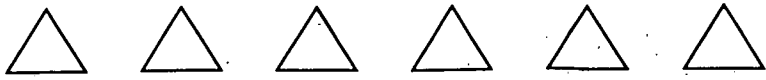
- F. $\frac{1}{36}$
G. $\frac{1}{25}$
H. $\frac{1}{18}$
J. $\frac{1}{6}$
K. $\frac{1}{3}$

21. Which of the following is a simplified form of $3x - (3 - x) + 1$?

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

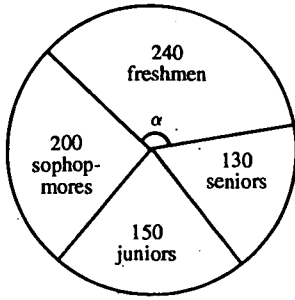
22. If $|2x - 2| = 4$, which of the following is a possible value for x ?

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



23. Lola is making the circle graph below showing the number of students at each grade level in her high school. What should be the measure of $\angle \alpha$?

- A. 99°
- B. 120°
- C. 133°
- D. 167°
- E. 240°



24. What point on the graph of $x^2 + y = 7$ has an x-coordinate of -2 ?

- F. $(-2, \sqrt{3})$
- G. $(-2, 3)$
- H. $(-2, 5)$
- J. $(-2, 9)$
- K. $(-2, 11)$

25. What is the slope-intercept form of the equation $6x - 3y = 7$?

- A. $y = 2x - 7$
- B. $y = 2x - \frac{7}{3}$
- C. $y = 2x - \frac{3}{7}$
- D. $y = 2x + \frac{7}{3}$
- E. $y = 2x + 7$

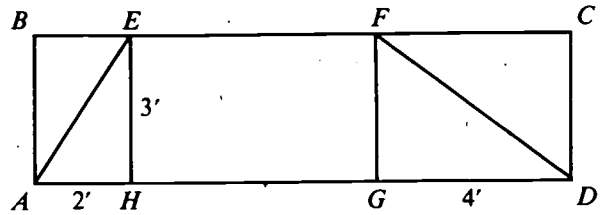
26. A line segment with length of $5\frac{1}{2}$ units is located on a number line with 1 endpoint fixed at coordinate $-3\frac{1}{2}$. What are the 2 possible coordinate locations of the other endpoint?

- F. 9 and -2
- G. 9 and -9
- H. 2 and -8
- J. 2 and -9
- K. 2 and 9

27. At a certain store, all radios are discounted to 15% less than the radio's regular price. A customer brings a radio marked with a regular price of \$120 to the checkout counter. If a sales tax of 5% of the purchase price is added (rounded to the nearest cent), how much money does the customer owe?

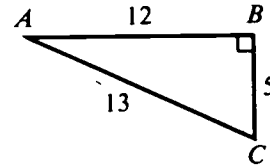
- A. \$102.90
- B. \$107.10
- C. \$108.00
- D. \$110.00
- E. \$110.25

28. Distances marked on the figure below are in feet. Points $B, E, F,$ and C are collinear as are points $A, H, G,$ and D . If the area of rectangle $ABCD$ is 33 square feet and \overline{EH} and \overline{FG} are each perpendicular to \overline{AD} , what is the area, in square feet, of trapezoid $AEFD$?



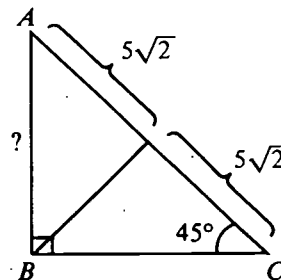
- F. 15
- G. 21
- H. 24
- J. 27
- K. 48

29. In right triangle $\triangle ABC$ below, what is the value of $\sin A$?

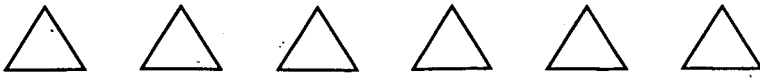


- A. $\frac{5}{13}$
- B. $\frac{12}{13}$
- C. $\frac{13}{12}$
- D. $\frac{12}{5}$
- E. $\frac{13}{5}$

30. In right triangle $\triangle ABC$ below, distances are shown in meters. How many meters long is \overline{AB} ?



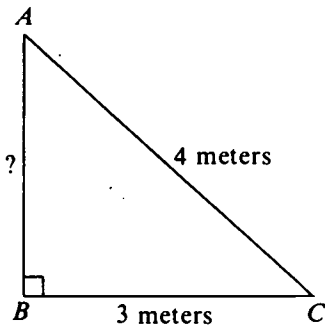
- F. 10
- G. $5\sqrt{2}$
- H. 5
- J. $\frac{5\sqrt{2}}{4}$
- K. $\sqrt{2}$



31. On Family Day, attendance at the baseball game set a record. A reporter for the local paper asked how many adults had paid to see the game. The box office reported that exactly 450 tickets had been sold, and \$2,000 was collected. If adults' tickets were \$5 and children's tickets were \$3, how many adults' tickets were sold?

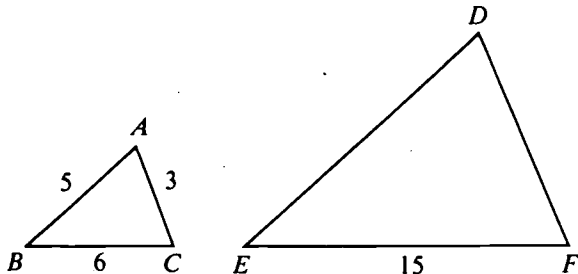
- A. 75
- B. 125
- C. 325
- D. 375
- E. 400

32. In the right triangle below, how many meters long is \overline{AB} ?



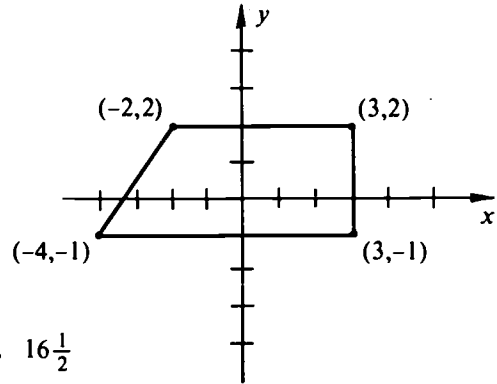
- F. 12
- G. 7
- H. 5
- J. 3
- K. $\sqrt{7}$

33. The 2 triangles below are similar, with $\angle A \cong \angle D$. What is the perimeter of $\triangle DEF$?



- A. 14
- B. 21
- C. 29
- D. 35
- E. 41

34. What is the area, in square units, of the trapezoid graphed below?



- F. $16\frac{1}{2}$
- G. 18
- H. 24
- J. 27
- K. 33

35. When graphed in the (x,y) coordinate plane, what is the slope of the line $\frac{y}{2} = x$?

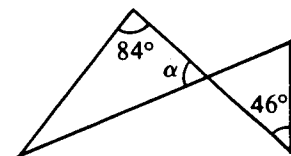
- A. -2
- B. $-\frac{1}{2}$
- C. $\frac{1}{2}$
- D. 1
- E. 2

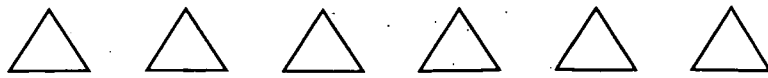
36. Three-ring notebooks are made in 2 steps. Machine A makes 180 covers per hour. Later, Machine B attaches the 3-ring paper holder and completes 150 notebooks per hour. How many hours should Machine A run in order to produce the right number of covers for Machine B to finish in exactly 8 hours of its operation?

- F. 5
- G. $5\frac{1}{3}$
- H. 6
- J. $6\frac{2}{5}$
- K. $6\frac{2}{3}$

37. If the triangles in the figure below are similar, then $\alpha = ?$

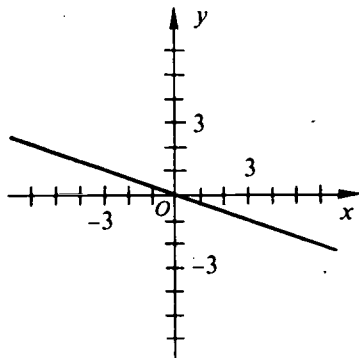
- A. 38°
- B. 46°
- C. 50°
- D. 65°
- E. 84°





38. Which of the following equations is graphed below?

- F. $y = -3x$
 G. $y = -\frac{1}{3}x$
 H. $y = \frac{1}{3}x$
 J. $y = 3x$
 K. $y = x - 3$



39. What is the radius, in meters, of a circle if its circumference is 36π meters?

- A. 6
 B. 12
 C. 18
 D. 36
 E. 72

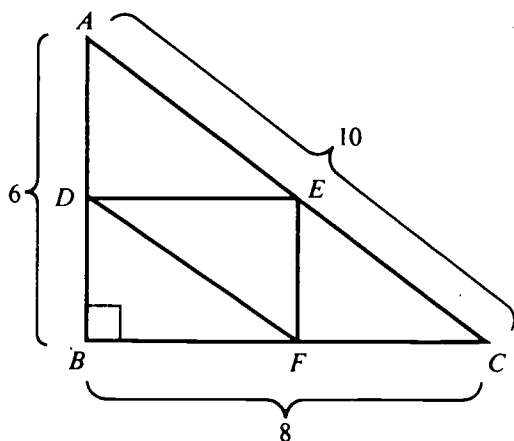
40. Whenever x and z are nonzero numbers,

$\left(\frac{x^{-2}}{z}\right)(x^2z^2)$ simplifies to:

- F. $x^{-4}z^2$
 G. $x^{-4}z$
 H. $x^{-4}z^{-1}$
 J. z^2
 K. z

41. In right triangle $\triangle ABC$ below, $AB = 6$, $BC = 8$, and $AC = 10$. Triangle $\triangle DEF$ was formed by connecting the midpoints of the sides of $\triangle ABC$. What is the area of $\triangle DEF$, in square units?

(Note: The notation AB represents the length of the line segment AB .)



- A. 6
 B. 10
 C. 12
 D. 18
 E. 24

42. Three times a year a camera shop has a sale on packages of batteries: in February packages are 3 for \$4.49, in April they are 5 for \$7.39, and in December they are 4 for \$5.88. In which ordered sequence of months does the price per package go from smallest to middle to largest?

- F. February, December, April
 G. April, February, December
 H. April, December, February
 J. December, February, April
 K. December, April, February

43. The trinomial $x^2 - x - 6$ can be factored as the product of 2 linear factors, in the form $(x + a)(x + b)$. What is the polynomial sum of these 2 factors?

- A. $2x - 1$
 B. $2x + 1$
 C. $2x - 5$
 D. $2x + 5$
 E. $2x - 6$

44. A rectangular field is twice as long as it is wide, and has an area of 288 square meters. How many meters long is it?

- F. 12
 G. 24
 H. 36
 J. 72
 K. 144

45. If $3ax + \frac{5r}{s} = 3ay$, then $x - y = ?$

- A. $\frac{5r}{s} - 3a$
 B. $\frac{-5r}{3as}$
 C. $\frac{-5r}{6as}$
 D. $\frac{-5r}{9a^2s}$
 E. $\frac{-10r}{3a^2s}$

46. If the total surface area, A , of a cylinder (including its ends) is given by the formula $A = 2\pi r^2 + 2\pi rh$, which of the following expresses h in terms of A and r ?

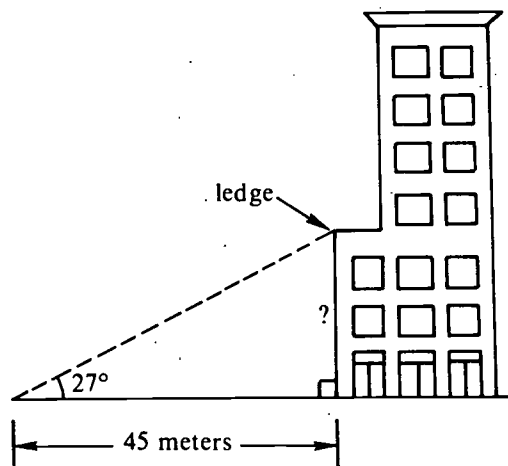
- F. $h = \frac{A}{2\pi r^2}$
 G. $h = 2\pi rA - r$
 H. $h = \frac{A}{2\pi r + r}$
 J. $h = \frac{A + 2\pi r}{2\pi}$
 K. $h = \frac{A - 2\pi r^2}{2\pi r}$



47. If $\frac{x}{6} + \frac{x}{4} = \frac{1}{2}$, then $x = ?$

- A. $\frac{1}{20}$
- B. $\frac{1}{10}$
- C. $\frac{1}{5}$
- D. $\frac{6}{5}$
- E. 5

48. From a point on the ground the angle of elevation to a ledge on a building is 27° , and the distance to the base of the building is 45 meters. How many meters high is the ledge?



- F. $\frac{45}{\sin 27^\circ}$
- G. $\frac{45}{\tan 27^\circ}$
- H. $45 \sin 27^\circ$
- J. $45 \cos 27^\circ$
- K. $45 \tan 27^\circ$

49. In the standard (x,y) coordinate plane there is only one circle centered at the point $(-1,4)$ that also passes through the point $(7,-2)$. Which of the following is an equation for that circle?

- A. $(x+1)^2 + (y-4)^2 = 10$
- B. $(x+1)^2 + (y-4)^2 = 100$
- C. $(x-1)^2 + (y+4)^2 = 100$
- D. $(x-4)^2 + (y+1)^2 = 100$
- E. $(x-4)^2 + (y+1)^2 = 10$

50. If a is any real number, for what real value(s) of b does the equation $|x+a| = b$ have NO solutions for x ?

- F. All $b < 0$
- G. Only $b = -1$
- H. Only $b = 0$
- J. All $b \neq 0$
- K. All $b > 0$

51. Which of the following is closest to 5×10^4 ?

- A. 1,000
- B. 5,000
- C. 100,000
- D. 500,000
- E. 6,250,000

52. Which of the following is equivalent to $\frac{1 - \cos^2 \theta}{\cos^2 \theta}$?

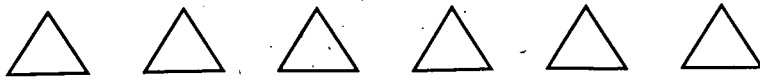
- F. $\sec^2 \theta$
- G. $(\csc^2 \theta) - 1$
- H. $\tan^2 \theta$
- J. $\sin^2 \theta$
- K. $-\frac{1}{\sin^2 \theta}$

53. To work properly, an engine part's diameter cannot be over the specified diameter of 3 centimeters by more than .05 centimeters, nor can it be under the specified diameter by more than .05 centimeters. If x is the diameter of a part, which of the following algebraic statements specifies these restrictions on x ?

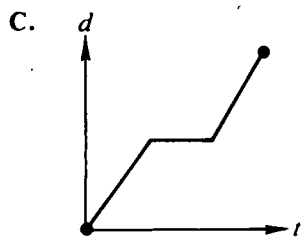
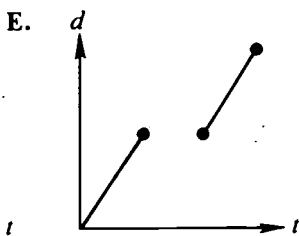
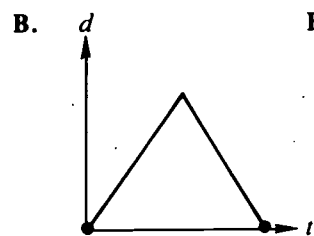
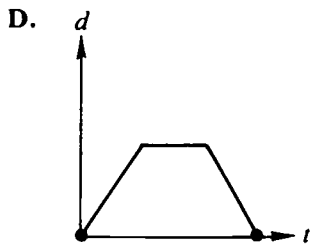
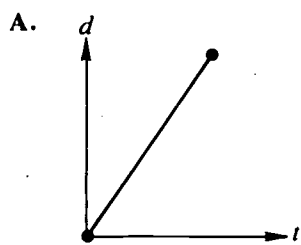
- A. $x - 3 \geq .05$
- B. $3 - x \geq .05$
- C. $|x - .05| \leq 3$
- D. $|3 - x| \leq .05$
- E. $|x| \leq .05$

54. For all $a \neq 0$, what is the slope of the line segment connecting (a,b) and $(-a,b)$ in the usual (x,y) coordinate plane?

- F. 0
- G. $\frac{a}{b}$
- H. $-\frac{b}{a}$
- J. $\frac{b}{a}$
- K. $2a$



55. Starting at her doorstep, Ramona walked down the sidewalk at 1.5 feet per second for 4 seconds. Then she stopped for 4 seconds, realizing that she had forgotten something. Next she returned to her doorstep along the same route at 1.5 feet per second. The graph of Ramona's distance (d) from her doorstep as a function of time (t) would most resemble which of the following?



56. For the quadratic equation $2x^2 + 5x + R = 0$, what value of R will make the solutions for x be $\frac{1}{2}$ and -3 ?

- F. 27
- G. 3
- H. 2
- J. $-\frac{3}{2}$
- K. -3

57. If A is the measure of an acute angle (that is, $0^\circ < A < 90^\circ$) and $\sin A = \frac{12}{13}$, what are the possible values of $\tan A$?

- A. $\frac{5}{12}$ and $-\frac{5}{12}$
- B. $\frac{12}{5}$ and $-\frac{12}{5}$
- C. $\frac{5}{12}$ only
- D. $\frac{12}{5}$ only
- E. $\frac{13}{12}$ only

58. If $\sqrt{(3 + \sqrt{x})} = 1 + \sqrt{2}$, then $x = ?$

- F. 0
- G. 2
- H. 4
- J. 8
- K. 10

59. If $f(x) = 3x^3 - 27x$, which of the following correctly describes the zeros of the polynomial?

(Note: Zeros are values of x where $f(x) = 0$)

- A. No real zeros
- B. Only 1 rational zero
- C. Only 1 real zero, which is irrational
- D. 1 number is a double zero
- E. 3 different rational zeros

60. Given 9 points, NO 3 of which lie on the same straight line, what is the maximum number of straight lines that can be drawn through pairs of those 9 points?

- F. 8
- G. 9
- H. 27
- J. 36
- K. 72

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 the novel *Rich in Love* by Josephine Humphreys (©1987 by Josephine Humphreys). In this selection, after finding an old Halloween costume, the narrator is confronted with past memories.

Rummaging in my mother's closet on Halloween, I found what I was looking for, in a plastic clothes bag jam-packed with folded woolens we would never wear again: there was the tell-tale striped fur, sticking out
5 from under a mohair scarf. Memories hit me; I grabbed a corner of the fur and pulled. Mothballs scattered across the floor like beads of poisoned white ice, releasing their sad futile smell. I had carefully packed these things away—cardigans and pullovers of bygone
10 cold seasons, out-of-fashion Scottish kilts held in place by giant safety pins, feebly small gloves—and mothballed them in case the day came when they might be needed. Mother had scoffed at the effort; but now I had been proved right. I needed her old Halloween costume.

I sat there on the floor trying to locate the tail, finally spotting it under Rae's old green crew neck. I bent the kinks out and gave it a smooth arc. The head was a problem. I couldn't find it anywhere, and doubted it had survived. It had been made from a paper bag; it
20 had probably been thrown away. But I recalled its every feature, the large mad eyes, the smile, whiskers, ears; and I knew I could replicate it.

"Look here," I said to Rae. "Can you give me a hand?"

25 She was on the sofa in the next room, watching television. . . . She didn't answer.

"All the materials have been assembled," I said, standing by the dining table with my hands on my hips, fingertips towards my back in the posture of a kindergarten teacher. "Glue, scissors, paper, Magic Markers.
30 First we have to locate the eye-holes. Can you come here for a sec and draw a spot where I put my finger?"

I put the bag over my head and pointed to where the eyes should be. "Right here, see? Just make two
35 marks, here and here." I waited about a minute. A long time. It was hard to breathe in the bag, but the interior of it was a beautiful golden-red, and it smelled good. . . .

"The grin goes like a crescent moon flopped onto
40 its back, wide, with lots and *lots* of teeth," I said, drawing the face in. I actually whistled briefly, a made-up tune that she, as a singer, would automatically recognize as a sham. "Gee," I said, shaking my head, "nobody enjoyed Halloween like Mother did. She loved
45 it, didn't she?"

Rae turned her eyes in my direction, but her face was stone-cold, the skin above her cheekbones puffy.

"It's her cat costume," I said, holding up the suit and the tail. "I'm remaking the head. I have a good idea
50 of what it looked like, but I'm a little worried about the ears. You wouldn't happen to remember how they were done, I don't guess."

She looked through me, and I was shamed by my own voice, that teacher's fake conviviality, the ruse of
55 arts-and-crafts. Rae's eyes said, *You don't know anything*. She was sick. I knew that, I knew that. I ought to have called her doctor, but at the same time I was thinking everything would be okay soon. A few more weeks. . . . She would get her chemistry back and
60 be her old self again.

For the last week, we had been literally tiptoeing through our rooms, afraid that any little creak or scrape would disturb her. . . . We brought her soft drinks, tea,
65 magazines. I tried to think up activities besides television, anything that might pique her interest.

"This is how the whiskers went, I think. Cut long strips of paper—I'm just using a second paper bag here—and run the flat edge of the scissors down the strip to make it curl. Voilà. Then glue each whisker, like
70 so, next to the nose, four on a side." She was watching. I glued quickly so I wouldn't lose her. Maybe I ought to be a kindergarten teacher. They have to be sneaky.

"For ears, let's try a small triangle cut from a double thickness and cupped, earlike. A flap bent at the
75 bottom can be glued down to hold it on, for a perfectly adequate ear. Rabbity, maybe, but fine for a temporary cat, in my opinion."

"Excuse me," she said, getting up with difficulty.

"Oh, don't go, Rae." I dropped the bag onto the
80 table. "I didn't mean to annoy you."

"Nothing annoys me," she said. "I feel bad."

"Do you want me to call Dr. Ellis?"

"What for? It's nothing serious. I must have eaten something that didn't agree with me."

85 "Well, he might be able to do something to make you feel better." . . .

"I don't think so," she said. "But thank you." It was the first time she had said anything polite to me in days.

1. According to the passage, the narrator finally located the cat costume's tail:

- A. under an out-of-fashion Scottish kilt.
- B. under Rae's old green crew neck.
- C. under a mohair scarf.
- D. beside a telltale striped fur.

2. The narrator claims that kindergarten teachers have to be:

- F. compassionate.
- G. tender.
- H. patient.
- J. sneaky.

3. According to the passage, the narrator cannot find the head to her mother's Halloween costume most probably because:

- A. the costume never really had a head.
- B. someone had already tossed it out.
- C. she is looking in the wrong place.
- D. Rae has taken it for her own use.

4. The majority of the items of clothing the narrator finds in her mother's closet (lines 1-14) have in common the fact that they are:

- F. things the narrator uses often.
- G. being saved for a particular future holiday.
- H. costumes for different holidays.
- J. unlikely to be used again.

5. One purpose lines 53-60 serve in relation to the passage as a whole is to suggest that:

- A. the narrator is frequently convivial in a manner best described as insincere.
- B. Rae's eyes are unusually expressive, especially when it comes to conveying her feelings about holidays.
- C. the narrator is worried about Rae but hopes she'll get better on her own.
- D. arts and crafts are something the narrator frequently concerns herself with.

6. As it is used in line 65, the phrase *pique her interest* most nearly means:

- F. get her to care about something.
- G. make her want to create a costume.
- H. cause her to see something.
- J. make her interesting.

7. According to the passage, the narrator's mother scoffed at the effort to preserve various folded woolens most probably because she felt that:

- A. her daughter should use her time to create things.
- B. those things would never again be needed.
- C. those things would be needed soon, and thus should not be stored away.
- D. having anything made from natural fur was immoral.

8. Given the information provided by the passage, Rae's manner might best be described as:

- F. casual.
- G. helpful.
- H. optimistic.
- J. subdued.

9. When the narrator of the passage says, "Memories hit me" (line 5), it seems most likely that she means that:

- A. seeing the old clothes made her nostalgic.
- B. she remembered her mother telling her to save the clothes.
- C. her past holds much more promise than her future.
- D. memories are often unpleasant and are best avoided.

10. One of the things we know about Rae from the passage is that she practices the art of:

- F. costume design.
- G. healing.
- H. teaching.
- J. singing.

Passage II

SOCIAL SCIENCE: This passage is adapted from Lewis Mumford's work *The Myth and the Machine: Technics and Human Development* (©1967 by Lewis Mumford). This passage notes the relationship between hunting and the development of imaginative art during the Paleolithic era.

Behind the fine craftsmanship and expressive art that characterized the last phases of Paleolithic culture was the mode of life brought about by specialization in hunting big game. In this pursuit a more cooperative strategy, requiring larger numbers of trackers, beaters, and killers, was required; and that presupposes a tribal or clan organization. Single family groups of less than fifty people, only a minority being adult males, could hardly have done the job. That Ice Age hunting life was necessarily dependent upon the movement of the great herds in search of fresh grazing or browsing grounds: yet it developed fixed points of reference and return. . . .

If curiosity, cunning, adaptability, inurement to repetition were—along with sociability—the prime virtues of early man, the later Paleolithic hunter needed still other traits: courage, imagination, adroitness, readiness to face the unexpected. At a critical moment in the hunt, when an enraged buffalo, already wounded, turned upon the hunters closing in upon him, the ability to act in concert at the command of the most experienced and daring hunter was the price of avoiding injury and sudden death. There was no parallel to this situation in food-gathering, nor yet in the later modes of Neolithic agriculture. . . .

Unlike food-gathering, be it noted, hunting carried with it an insidious danger to man's tenderer, parental, life-fostering nature: the necessity to kill as a recurrent occupation. The stone-pointed javelin or arrow, with its capacity to strike home at a distance as well as at close quarters, enlarged the range of killing and appears at first to have awakened anxious misgivings as to its effects. Even toward the cave-bears he expelled from their shelters and ate for food, Paleolithic man seems to have nourished a sacred fear, as with his later totemic animals. The skulls of these animals have been found arranged as if they were the objects of a cult. Like some hunting tribes to this day, Paleolithic hunters possibly begged the slain creatures' forgiveness, pleading hunger as justification, and limiting the kill to such food as was actually needed. . . .

The systematic killing of big game probably had still another effect upon Paleolithic man: he was confronted by the fact of death, not at infrequent intervals, but as an everyday accompaniment to life. To the extent that he may have identified himself with his victim, he was forced to take into consciousness his own death, too, and that of his family, his kinsmen, his fellow tribesmen.

Here, under the further incitements of dream, may lie the beginnings of man's devious efforts to prolong his life in the imagination, by assuming that the dead, though physically removed from the scene, are still in some sense alive, watching, intervening, prompting:

sometimes benignly, as a source of wisdom and comfort; but in no small number of instances the spirits of the departed, haunting the dream life, are full of malice and must be exorcised, or propitiated, lest they bring on disaster. Perhaps the memorial arts of sculpture and painting, which flourished now for the first time, were deliberate attempts to outwit death. Life departs, but the image remains and continues to enhance other lives.

The greater part of Paleolithic art was preserved in caves; and in the case of some of the painted images and sculpture found there—about ten percent of the total number—we have reason to associate the art with magic rituals to invoke success in hunting. . . . If magic ritual was invoked by the hunter, it was because in the very performance of it he acquired both the insight and the skill necessary to carry out his task successfully. The kind of graphic line achieved in the paintings of the bisons of Altamira or the deer of Lascaux implies fine sensory-muscular coordination, along with the sharpest kind of eye for subtle detail. Hunting, as everyone who has hunted even in the most desultory way knows, requires a high degree of visual and aural alertness to the least quiver of movement in leaves or grass, along with hair-trigger readiness to react promptly. That the Magdalenian hunter had attained this state of sensory vividness and esthetic tension is shown, not merely by the evocative realism of his highly abstract representations, but by the fact that many of his animals are depicted in motion. . . .

All that we can say with any surety about this phase of human development is that hunting was a propitious medium for imaginative art. . . .

So while hunting in the grand style required daring muscular exploits and promoted a surgical hardness about inflicting pain and taking life, it was also accompanied by an increase in esthetic sensitiveness and emotional richness—preludes to further symbolic expression.

11. According to the passage, dreams incited:
- A. efforts to improve hunting skills.
 - B. efforts to improve the graphic line used in drawing.
 - C. the invention of stone-pointed javelins and arrows.
 - D. assumptions that the dead are still, in some sense, alive.
12. According to the passage, what was the impact of stone-pointed javelins or arrows?
- F. They enlarged the range of killing.
 - G. They allowed bigger game to be killed.
 - H. They made it possible for smaller groups to hunt big game.
 - J. They magnified the impact of the hunters' blows.

13. The author infers that late Paleolithic groups developed highly disciplined hunting practices from the knowledge that:
- the animals they hunted were scarce.
 - they lived during the Ice Age, when food was scarce.
 - the animals they hunted were dangerous.
 - they competed with food gatherers for scarce resources.
14. The author mentions the movement of the great herds from place to place as an example of:
- something described in the cave paintings at Lascaux but not at Altamira.
 - a factor that gave rise to the development of magic rituals.
 - one reason for the development of stone-pointed javelins and arrows.
 - a variable that shaped the mode of life of Paleolithic hunters.
15. What evidence in the passage is offered to support the claim that Paleolithic hunters were skillful?
- They lacked courage, imagination, adroitness, and readiness to face the unexpected.
 - The art they left behind demanded the fine sensory-muscular coordination required for skillful hunting.
 - The art they left behind reveals curiosity, cunning, adaptability, and inurement to repetition.
 - Fine art, such as they left behind, is usually associated with skillful hunting societies.
16. The main idea of the first paragraph is that:
- the late Paleolithic mode of life was affected by the specialization required in big-game hunting.
 - early Paleolithic hunters formed larger social groups than later food gatherers.
 - only a minority of late Paleolithic hunters were adult males.
 - the migrations of the great herds determined the late Paleolithic way of life.
17. One can infer from the passage that the author describes painting and sculpture as "memorial arts" (line 58) because they were meant to:
- remind Paleolithic hunters of Neolithic achievements.
 - teach Paleolithic man of needed hunting techniques.
 - circumvent death by preserving images of people who had died.
 - remind Paleolithic hunters of earlier, food-gathering people.
18. According to the author, the mode of life brought about by specialization in hunting big game caused:
- Paleolithic hunters to be conscious of death.
 - imaginative and well-executed painting and sculpture to be created.
 - Paleolithic hunters to discard those virtues useful in earlier food gathering.
- I only
 - I and II only
 - II and III only
 - I, II, and III
19. How does the passage distinguish Paleolithic hunters from earlier food gatherers?
- Paleolithic hunters were able to operate in smaller social groups.
 - Paleolithic hunters were more likely to live in family groups of less than fifty people.
 - Paleolithic hunters added new traits to those that earlier men had possessed.
 - Paleolithic hunters were more virtuous than earlier men.
20. Is the following sentence (lines 36–40) treated in the passage as an established fact?
- Like some hunting tribes to this day, Paleolithic hunters possibly begged the slain creatures' forgiveness, pleading hunger as justification, and limiting the kill to such food as was actually needed.
- No, because it is a fact that the hunters described were inured to killing.
 - No, because it is the author's inference from the positions in which the animals' skulls were found.
 - No, because it is the author's inference from the fact that Paleolithic hunters never killed more than they ate.
 - Yes, because it is a fact that some hunting tribes still ask the animals' forgiveness.

Passage III

HUMANITIES: This passage is adapted from *Women Poets of the World* by Rob Swigart (©1983 by Macmillan Publishing Co., Inc.). This passage explains how women from the Heian Period helped to shape Japanese literature.

Poetry begins in life and its necessities, but in order to flourish as a written art it requires leisure, the time to pursue and to perfect. The Heian Period (794–1185 A.D.) in Japan provided an abundance of that leisure and the desire to perfect a tradition which is unique in the histories of world literature.

The word *Heian* itself means “peace,” “tranquillity.” Culture—visual arts, literature, philosophy, music—was concentrated in Kyoto, where an elegant court gathered around the Emperor and his family. Outside of the capital there was little of interest to these perhaps two thousand people; enormous energy was concentrated in just a few square miles, an energy which could be devoted entirely to clothing, poetry, food, incense and intrigue. There were no wars, no invasions from outside this insulated and insular country, no popular uprisings to distract attention from the refinement of the senses.

Japanese was, during the entire Heian era, considered unsuited to the lofty thoughts of serious poetry, for which the Chinese language was reserved. Japanese would be used for occasional poems, love verses, the literature of seduction and lament. It was left to women to write in Japanese, in the vernacular, while men reserved the supposedly more difficult Chinese for themselves, unaware that what they were writing was imitation Chinese literature, inferior to the original, and, above all, inferior to what contemporary women were writing in their native tongue. . . . But in time it became apparent that all that once appeared trivial and marginal was in fact the outstanding achievement in Japanese literature, and one of the greatest achievements in all of world literature. Women produced the best, the greatest classics in Japanese: not simply *The Tale of Genji*, Murasaki’s *Diary*, the *Pillow Book of Sei Shonagon*, but the poetry of Ono no Komachi, Ise, Otomo no Sakanoe and others. So important were women to the native literature that when men set their hands to writing poetic diaries, as Ki no Tsurayuki did in the *Tosa Diary*, they often wrote under the persona of a woman.

It is clear then that women occupied a strong position in Japan during the first centuries following the development of literacy, so long as the vernacular remained outside the realm of power and prestige. During these first five hundred years they created the themes, forms and moods which shaped subsequent Japanese literary tradition: the *tanka*, with its elegiac tone and characteristic imagery; the diary; and the novel.

Deeply embedded in the poems of [Japanese women] are feelings of regret about the shortness of life, the fickleness of love, and the ravages of age, which imbue them with a brooding melancholy. They rapidly

became conventionalized and traditional, a sorrowful lament, perhaps, for the passing of desire as much as for the torment of it. These elegiac feelings, and a dark mysteriousness, are an essential part of the tradition, with special literary terms and meanings; they are no longer confined to women.

At the end of the Heian era, when political and military upheaval destroyed the leisurely culture in Kyoto, men, and martial virtues, took over the vernacular as well as official culture. Then poetry became something to occupy the rare moments of rest in a soldier’s life, or in the lives of hermits, priests, or courtiers confined to the distant court far from important events.

The imitation of Chinese poetry became a secondary occupation even for men; women surrendered their pre-eminence in the vernacular literature, and finally, as in so many other cultures, nearly vanished from the anthologies. The tradition they had done so much to shape was carried on by men.

Not until the beginning of the twentieth century did women reappear as an important force in Japanese literature, despite the existence of one or two significant *haiku* poets, for example Chiyo, in the Tokugawa period. Some modern women poets, like Yosano Akiko, returned to traditional forms, *haiku* and *tanka* (which had fallen into disuse), and made use of traditional imagery, but expanded the range of feeling and experience to include more psychological and emotional complexity. Others, like Shiraishi Kazuko, have absorbed various manifestations of Western culture, from T. S. Eliot, Ezra Pound and other modern poets to jazz rhythms and cabaret songs. The swift industrialization of post-World War II Japan has produced changes in lifestyle and in the conditions of women; these changes have had a profound effect on their poetry.

21. The Heian period in Japan was known as a period of:
 - A. international expansion.
 - B. quiet leisure.
 - C. political upheaval.
 - D. cultural dormancy.
22. Which of the following phrases best describes the *tanka* form of Japanese poetry?
 - F. A verse form inherited from Chinese sources
 - G. An epic form exploring martial themes
 - H. A form derived from the works of Eliot and Pound
 - J. A traditional form elegiac in tone
23. According to the passage, the end of the Heian era was caused by:
 - A. the leisurely culture.
 - B. political and military upheavals.
 - C. the dominance of martial virtues.
 - D. a cultural revolution.

24. The first paragraph suggests a certain contradiction in the development of poetry: namely, that although the inspiration for poetry lies in the activities of life, its:
- F. flourishing as a written art requires periods of leisure.
 - G. demise will be signaled by an abundance of leisure time.
 - H. perfection depends on a commitment to the past.
 - J. true success lies in the necessities of life.
25. This passage focuses primarily on which of the following?
- A. The poets of modern Japan
 - B. The role of martial values in Japanese poetry
 - C. The role of women poets in Japanese literature
 - D. The changing nature of feminist poetry
26. Particular attention was paid to the Heian era in this passage primarily to illustrate which of the following?
- F. The emergence of women as a force in Japanese literature
 - G. A typical cultural period in Japanese history
 - H. The dominance of Chinese thought on Japanese culture
 - J. The effect of military and political upheavals on culture
27. According to the passage, in the period between the Heian era and the twentieth century, Japanese women poets did all of the following EXCEPT:
- A. surrender their prominence in the vernacular culture.
 - B. watch men carry on the traditions they had established.
 - C. disappear as an important force in Japanese literature.
 - D. take up the imitation of Chinese poetry.
28. According to the passage, a list of literary classics produced by Japanese women should include which of the following?
- I. *The Tale of Genji*
 - II. *The Tosa Diary*
 - III. *The Pillow Book of Sei Shonagon*
- F. II only
 - G. I and III only
 - H. II and III only
 - J. I, II, and III
29. As it is used throughout the passage, the word *vernacular* refers to:
- A. a foreign language.
 - B. the official language of a court.
 - C. the language of an invading culture.
 - D. the native language.
30. The passage suggests that when Japanese women poets returned to the traditional forms after the beginning of the twentieth century, they revitalized those traditional forms by doing which of the following?
- F. Expanding the range of feeling to include more psychological and emotional complexity
 - G. Turning once again to contemporary Chinese poetry for guidance in forms and moods
 - H. Purging various manifestations of Western culture that had crept into Japanese poetry
 - J. Tacking the rhythms of jazz and cabaret songs onto the traditional poetic forms

Passage IV

NATURAL SCIENCE: This passage is adapted from David Quammen's *Natural Acts: A Sidelong View of Science and Nature* (©1985 by David Quammen). In this selection, Quammen describes the unusual attributes of the sea cucumber.

Sea cucumbers are not vegetables. They only look and act that way. In fact they are marine animals of the echinoderm phylum, a primitive group that also includes starfish, sea urchins, and two other star-shaped members called the feather-stars and the brittle-stars. Echinoderms are distinct from almost all other animal groups in being radially, rather than bilaterally, symmetrical. In other words they know top from bottom but not front from back nor left side from right side. They all share a pentamerous anatomical organization, with most of their features occurring in fives: five axes of symmetry, five sets of each organ, five major arteries, and for those like the starfish and the brittle-stars, five legs. They have a mouth hidden under the belly, and an anus that generally marks the center of their back. The skin of an echinoderm is often described as "leathery" or "rubbery" but think instead of the texture of imperfectly cooked tripe. Imbedded in that skin are calcareous plates, in some cases quite small and with no interconnections, constituting a minimal skeleton. Echinoderms have been known to stay in one spot, without moving, for up to two years. They have never heard of eyes. They developed all these eccentric proclivities, back in the Cambrian period a half billion years ago, before any consensus arose as to how an animal is supposed to behave. But just as the echinoderms are exceptional among animals, so the sea cucumbers are exceptional among echinoderms.

They retain the five-sided symmetry on the inside but don't give much hint of it externally. Sometime in the dim past they grew so tall and top-heavy that they have tipped over permanently onto one flank. The radial symmetry is now 90 degrees off kilter. Consequently they *do* have a discernible front: the end with the mouth, around which have been added a ring of tentacles like the leaf ends of celery. . . . They shuffle across the sea bottom in worm-like fashion, by means of muscular contractions and elongations that roll down their soft bodies in waves. Moving deliberately, they swallow the rich benthic mixture of sand and muck, strain the organic debris from it in their long simple gut, and pass the sterile sand out behind. Theoretically at least, they glide along like an open pipe while the sand, rippling faintly as it is cleaned, remains stationary.

In sea cucumbers (again, uniquely among all echinoderms) the skeletal plates are reduced to microscopic size and come in delicate patterns like snowflakes, but serve who knows what use. In overall body shape, some species resemble Italian sausages, some are more faithful to their garden namesake, some display the distinguished profile of a balloon overfilled precariously with tapioca. They range from the size of a baby gherkin to the size of a huge zucchini, one of those monstrous country-fair winners that gets its photo sent

out on the AP wire. They are variously decorated in swirls and mottles and stripes of lavender, orange, yellow, parakeet-green. Truly these guys are out in left field.

60 But it bothers them not. In the deepest trenches of the ocean they carry on blithely and quite successfully, working a zone that few other animals are equipped to explore. Researchers on the ocean abyss have discovered that, at a depth of 13,000 feet, sea cucumbers
65 account for half of all the living organisms. Down at 28,000 feet, the sea cucumber majority rises to 90 percent. And at the ocean's bottomest bottom, 33,000 feet down in the Philippine Trench, almost no living creatures are to be found—except sea cucumbers.

70 In shallower waters, like those coral formations off the west coast of Mexico, they also get along well. This is in part because sea cucumbers have few natural predators, owing presumably to the various nasty poisons contained in the mucous secretions of their
75 skin. Additionally, some species have developed the useful trick of self-mutilation: If a lobster or an otter or a snoopy human lays hold of one of this group, the sea cucumber constricts itself drastically at certain points along the body, and breaks into several pieces. The
80 predator, ideally, will be satisfied with a middle or a posterior section. All the sections are destined to die except the front end, with the mouth and tentacles. If this chunk is left in peace, from it will regenerate a new entire cucumber.

31. According to the passage, the sea cucumber's movement across the ocean floor is accomplished by means of:
- its five-sided symmetrical motions.
 - muscular contractions and elongations.
 - the wiggling of its tentacles.
 - its bilateral radial symmetry.
32. According to the passage, which of the following species might bother a sea cucumber?
- Sea otter
 - Starfish
 - Lobster
- I only
 - I and II only
 - I and III only
 - II and III only
33. According to the passage, when did the sea cucumber's behavioral patterns first evolve?
- Several billion years ago
 - When they observed and imitated other echinoderms
 - During the Cambrian period
 - Before other echinoderms' behavioral patterns evolved

34. According to the passage, sea cucumbers have gotten off kilter because at some point in their development they grew:
- F. too tall and top-heavy.
 - G. too round and long.
 - H. too flat on the bottom.
 - J. smaller skeletal plates.
35. It can reasonably be inferred from the author's comment "Truly these guys are out in left field" (lines 58–59) that he feels sea cucumbers are:
- A. perhaps the most misunderstood sea animals ever known.
 - B. awfully strange and eccentric sea animals.
 - C. a species that lives far from other sea animals.
 - D. known to come in quite a range of sizes.
36. It can reasonably be inferred from the passage that, in order to eat, sea cucumbers must:
- F. move slowly along the bottom of the sea.
 - G. flip onto their backs and move along the bottom of the sea.
 - H. move to their left and then their right along the bottom of the sea.
 - J. move their calcareous plates in a pentamerous fashion.
37. The main point of the fourth paragraph (lines 60–69) is that sea cucumbers:
- A. account for the majority of undersea animals.
 - B. are studied often by researchers on the ocean abyss.
 - C. live successfully where few other sea animals can.
 - D. actually enjoy being different from other animals.
38. According to the passage, in terms of their appearance, sea cucumbers are:
- F. about the same size but exhibit a variety of colors.
 - G. different sizes and are also variously decorated.
 - H. different sizes and are rarely striped lavender, orange, yellow, or parakeet green.
 - J. different sizes and are ringed in delicately patterned colors.
39. It can reasonably be inferred from the first paragraph that the author feels descriptions of echinoderms' skin as "leathery" and "rubbery" are:
- A. evidence of the animals' minimal skeleton.
 - B. precise and accurate.
 - C. more characteristic of the feel of starfish.
 - D. almost but not exactly accurate.
40. According to the passage, the sea cucumber's pentamerous anatomical organization differs from that of a starfish in that it:
- F. relies on delicate skeletal plate patterns.
 - G. is even more pronounced externally.
 - H. exhibits remarkable and inexplicable inconsistencies.
 - J. is not especially obvious externally.

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 1

A geologist conducted three studies to evaluate the rate at which water enters and leaves a lake and its effect on lake volume. Water entering the lake is called *inflow* and water leaving is called *outflow*. The studies were conducted over a five-year period.

Study 1

The geologist measured two major sources of water inflow: rainfall and inflowing streams. Measurements of each were taken regularly over the five-year period. From these measurements, the geologist calculated that the annual averages totaled 260×10^6 cubic meters of water per year (m^3/yr). The results are in Table 1.

Table 1

Type of inflow	Average inflow (m^3/yr)
Inflowing streams	200×10^6
Rainfall on lake	60×10^6

Study 2

Water leaves the lake naturally by outflowing streams, evaporation, and infiltration into the rocks below the lake. Measurements of these three processes were taken regularly over the five-year period. In addition, a water company pumps water out of the lake to supply several communities. The water company gave the geologists measurements of the pumping rate during the investigation period. A total outflow of $300 \times 10^6 m^3/yr$ was calculated. The average outflow for each process is in Table 2.

Table 2

Type of outflow	Average outflow (m^3/yr)
Outflowing streams	100×10^6
Evaporation	50×10^6
Infiltration	60×10^6
Pumping	90×10^6

Study 3

The geologist installed a water depth recorder at the center of the lake and took regular monthly readings during the five-year period. These readings were averaged each year. The lake level was found to be decreasing at an average rate of 10 cm per year.

- If dams were constructed to effectively stop the escape of water by outflowing streams, which of the following is most likely?
 - Total outflow would equal total inflow.
 - Total outflow and lake volume would both probably increase.
 - Total outflow and lake volume would both probably decrease.
 - Total outflow would decrease and lake volume would increase.
- If the area had experienced a lack of rainfall during the five-year study period, how would this have affected the results?
 - Total outflow would be higher.
 - Total inflow would be lower.
 - Infiltration would be higher.
 - All results would be unaffected by the drought.
- Which of the following generalizations about the lake's water balance can be made based on the results of the studies?
 - For any lake, total water outflow always exceeds total water inflow.
 - The number of inflowing streams exceeds the number of outflowing streams.
 - If the rates of water entering and leaving a lake are not balanced, lake depth will change.
 - A lake cannot have both inflowing and outflowing streams and maintain a constant volume.



4. Would the geologist have obtained more accurate results if the investigation period was decreased from five to two years?
- F. Yes, because there would be less chance of human error in the measurements.
 - G. Yes, because there would be fewer variables to consider.
 - H. No, because abnormally high or low measurements would distort the averages.
 - J. No, because water movement in and out of the lake is slow.
5. Which of the following assumptions was made in all three studies?
- A. The three studies were done at different five-year periods.
 - B. The lake is underlain by rock that water cannot infiltrate.
 - C. Total inflow and outflow were constant during the investigation.
 - D. All significant inflows and outflows of water were identified.
6. Based on the results of the studies, the geologist concludes that lake volume decreased annually. Which of the following would help support that conclusion?
- F. Determining if rainfall rate increased annually
 - G. Determining if the surface area of the lake decreased annually
 - H. Repeating the same studies on a different lake
 - J. Repeating the depth measurements on a different lake

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Passage II

Fossil footprints of dinosaurs can be used to identify the type, size, speed, and gait of these animals. Determination of *gait* (the manner of moving on foot) is based on comparisons with speeds at which modern animals walk and run. Geologists performed the following studies to help estimate this information for some ancient footprints.

Study 1

A 68-million-year-old fossil trackway was discovered in a rock formation that consisted of alternating layers of mudstone and sandstone. A *trackway* is a path or trail commonly used by groups of animals. In the top mudstone layer, five sets of tracks were exposed that belonged to several species of two-legged dinosaurs. The tracks were oriented in the same direction and were formed at approximately the same time. Geologists concluded that two sets were made by meat-eating dinosaurs and the other three sets by plant-eaters. Measurements of the foot length and *stride length* (distance between successive footprints) of each set of dinosaur tracks were taken at the trackway.

Study 2

A geologist measured the skeletons of meat-eating and plant-eating dinosaurs in a museum. Table 1 shows the leg length, foot length, and ratio of leg length to foot length for those museum specimens.

Table 1

Dinosaur	Leg length (m)	Foot length (m)	Ratio
Large meat-eater	3.25	0.78	4.2:1
Small meat-eater A	1.33	0.31	4.3:1
Small meat-eater B	0.69	0.17	4.1:1
Large plant-eater	2.46	0.68	3.6:1
Small plant-eater	0.44	0.12	3.7:1

Study 3

The leg length of the five dinosaurs from Study 1 was estimated using the data from Study 2. Their estimated speed was then calculated from modern animals that have stride-length-to-leg-length ratios similar to those of dinosaurs. Table 2 shows the calculated leg length, calculated speed, and gait of the dinosaurs.

Table 2

Dinosaur	Leg length (m)	Speed (m/sec)	Gait
Meat-eater 1	2.60	2.0	walk
Meat-eater 2	0.22	3.5	run
Plant-eater 1	1.60	4.8	run
Plant-eater 2	0.14	4.3	run
Plant-eater 3	0.13	3.0	run

7. A geologist hypothesized that speed is related to the cold- or warm-bloodedness of an animal and that warm-blooded animals usually move at higher speeds. If this is true and some dinosaurs were known to be warm-blooded, which dinosaur in Study 3 was most likely warm-blooded?
 - A. Meat-eater 1
 - B. Meat-eater 2
 - C. Plant-eater 1
 - D. Plant-eater 3

8. Based on the information provided by the three studies, one can make the generalization that if:
 - F. speed is known, the type of dinosaur can be determined.
 - G. stride length and leg length are known, a dinosaur's speed can be estimated.
 - H. leg-length-to-foot-length ratio is known, the weight of the dinosaur can be calculated.
 - J. the type of food a dinosaur ate is known, its gait can be determined.

9. The information gathered in Study 2 was necessary because it:
 - A. showed the exact species of the dinosaurs in Study 1.
 - B. allowed the geologist to estimate the speed of the dinosaurs in Study 3.
 - C. determined the age of the fossil trackway discovered in Study 1.
 - D. helped to identify the rock types in the formation of Study 1.

10. A fossil trackway is found in an exposed sandstone layer that is less than 20 million years old. The tracks belong to a large flightless bird. Would Studies 1, 2, and 3 need to be modified to estimate the speed of this bird?
 - F. Yes, because measurements should be done on museum skeletons of fossil flightless birds.
 - G. Yes, because Study 1 used more than one set of tracks.
 - H. No, because birds are thought to be the ancestors of dinosaurs.
 - J. No, because the bird would have a speed that falls within the range of those of the dinosaurs in Table 2.



11. Another section of the trackway, 100 m farther down the path from the first site, is discovered. All five sets of tracks can be seen and are measured as in Study 1. It is found that Meat-eater 1 now has a speed of 4.6 m/sec, while the other speeds stayed the same. Which of the following conclusions is NOT consistent with the new data?
- A. Meat-eater 1 has changed gaits from walking to running.
 - B. Meat-eater 1 will overtake the other four dinosaurs.
 - C. Plant-eater 1 is in the least danger of being overtaken by Meat-eater 1.
 - D. Plant-eater 3 is in the most danger of being overtaken by Meat-eater 1.
12. Which of the following alterations to the method of Study 2 would have made the results of Study 3 more accurate?
- F. Measuring the skeletons of dinosaurs that belong to species of dinosaurs other than those in Study 1
 - G. Measuring the skeletons of more specimens of the same species as those in Study 1
 - H. Measuring only the foot length of modern animals of various types
 - J. Measuring the foot length of the small front feet of two-legged dinosaurs

Passage III

Tables 1 and 2 summarize information about the resistance of some 1-meter (m)-long aluminum and copper wires, respectively, that have different diameters. The resistance of a wire (reported in ohms) restricts the flow of electrons through the wire and results in the conversion of electrical energy to heat. Table 3 reports the resistance, in ohms, of different lengths of 0.10-mm-diameter aluminum wire at 20° C.

Table 1

Diameter of aluminum wires (mm)	Resistance (ohms) at:		
	0° C	20° C	50° C
0.08	5.20	5.64	6.31
0.10	3.27	3.55	3.97
0.16	1.29	1.40	1.57
0.20	0.81	0.88	0.99

Table 2

Diameter of copper wires (mm)	Resistance (ohms) at:		
	0° C	20° C	50° C
0.08	3.17	3.44	3.85
0.10	1.99	2.16	2.42
0.16	0.79	0.86	0.96
0.20	0.50	0.54	0.60

Table 3

Length of 0.10-mm-diameter aluminum wire (m)	Resistance (ohms) at 20° C
1	3.55
2	7.10
4	14.20
10	35.50

14. Based on the information in Table 3, one would predict that a 20-m length of aluminum wire with a 0.10-mm diameter would have a resistance of:

F. 16 ohms.
G. 25 ohms.
H. 34 ohms.
J. 71 ohms.

15. Could an experimenter calculate the *density* (mass/volume) of aluminum from a single table provided in the passage?

A. No, because the mass of only the aluminum wire is known.
B. No, because the mass is not given for any of the wires.
C. Yes, because both the mass and the volume of each wire can be calculated.
D. Yes, because the density is already given in the tables.

13. To determine if metal type affects resistance, the resistance of a copper wire with a diameter of 0.16 mm at a temperature of 0° C should be compared to the resistance of:

A. an aluminum wire with a diameter of 0.16 mm at 0° C.
B. an aluminum wire with a diameter of 0.16 mm at 20° C.
C. a copper wire with a diameter of 0.08 mm at 0° C.
D. a copper wire with a diameter of 0.16 mm at 20° C.

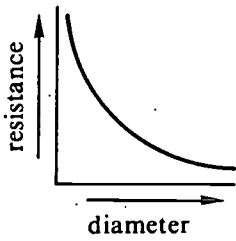
16. According to the data in Tables 1 and 2, which of the following sets of conditions would lead to the lowest resistance through 1 m of wire?

F. Aluminum wire, small diameter, high temperature
G. Copper wire, small diameter, low temperature
H. Copper wire, large diameter, low temperature
J. Copper wire, large diameter, high temperature

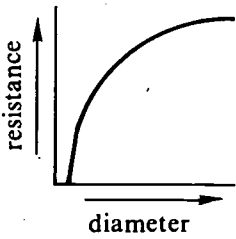


17. Which of the following graphs best represents the relationship between diameter and resistance for wires made of aluminum?

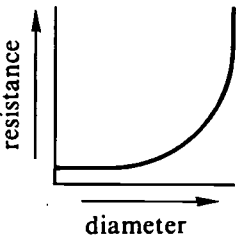
A.



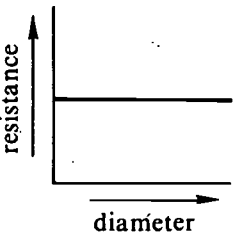
B.



C.

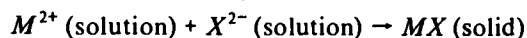


D.



Passage IV

Barium (Ba), calcium (Ca), magnesium (Mg), and strontium (Sr) exist in their compounds as M^{2+} ions (Mg^{2+} , Ca^{2+} , etc.). When solutions of these ions are mixed with solutions containing X^{2-} ions (SO_4^{2-} [sulfate], CO_3^{2-} [carbonate], etc.), salts will *precipitate* (form a solid) if the combination of positive and negative ions forms an *insoluble* (not dissolving in solution) salt, MX :



The following table summarizes the results of combining various metal nitrate solutions of equal concentrations with various solutions containing X^{2-} ions.

	Barium nitrate	Calcium nitrate	Magnesium nitrate	Strontium nitrate
Sulfuric acid (H_2SO_4)	white precipitate	no reaction	no reaction	white precipitate
Sodium carbonate (Na_2CO_3)	white precipitate	white precipitate	white precipitate	white precipitate
Ammonium oxalate [$(NH_4)_2C_2O_4$]	white precipitate	white precipitate	no reaction	white precipitate
Potassium chromate (K_2CrO_4 in acid)	yellow precipitate	no reaction	no reaction	no reaction

18. The addition of sulfuric acid to calcium nitrate results in "no reaction." In terms of what the chemist observes in the reaction beaker, "no reaction" takes place when:
- F. a white solid forms.
 - G. a yellow solid forms.
 - H. the solution changes color.
 - J. no solid forms and the solution does not change color.
19. An unknown solution containing salts of two of the four elements barium, calcium, magnesium, and strontium gives no reaction with sulfuric acid. Based on the table, the unknown solution probably contains:
- A. barium and calcium ions.
 - B. barium and strontium ions.
 - C. calcium and magnesium ions.
 - D. magnesium and strontium ions.
20. A student was given a solution that contained only one metallic ion, which was either Sr^{2+} or Ca^{2+} . The student was told to run one test with only one *reagent* (a substance used to identify or produce other substances) to identify the ion. Which one of the following reagents should the student use to correctly identify the ion?
- F. Sulfuric acid
 - G. Sodium carbonate
 - H. Ammonium oxalate
 - J. Potassium chromate
21. Based on the table, which of the following experimental results confirms that an unknown solution contains magnesium nitrate ions only?
- A. No reaction in sulfuric acid
 - B. No reaction in sulfuric acid followed by no reaction in potassium chromate solution
 - C. No reaction in potassium chromate followed by a white precipitate in sodium carbonate solution
 - D. No reaction in ammonium oxalate followed by a white precipitate in sodium carbonate solution



22. A solution contains a mixture of equal concentrations of barium, calcium, magnesium, and strontium ions. The procedure that would best separate the ions by precipitation (followed by filtration) would be to add X^{2-} ion solutions in which of the following orders?

- F. Sulfate, chromate, carbonate, oxalate
- G. Carbonate, sulfate, oxalate, chromate
- H. Oxalate, sulfate, carbonate, chromate
- J. Chromate, sulfate, oxalate, carbonate

Passage V

A pendulum is made by suspending a mass by a thin wire from a fixed support (see Figure 1 below). If the mass is pulled out such that the wire is at some small angle from the vertical direction and released, the mass will *oscillate* (swing back and forth between the position at which it was released and a position opposite that at which it was released). The time required for one such oscillation (over and back) is the *period* of the pendulum. The purpose of the following experiments is to determine how particular physical variables affect the measured period of a pendulum.

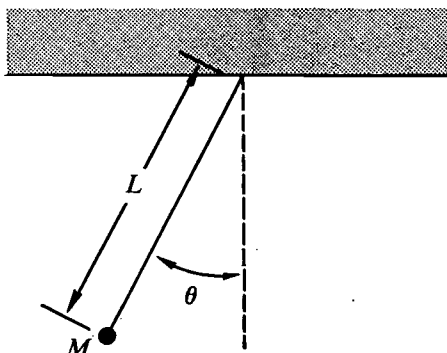


Figure 1

Experiment 1

The experimenter used three objects of different mass as pendulum weights. The wire length and the angle of initial displacement are held constant. The results of this experiment are presented in Table 1.

Table 1

Mass (kg)	Period (sec)
0.50	1.40
1.00	1.39
2.00	1.41

Experiment 2

The experimenter used three different lengths of wire to suspend the mass. The amount of mass suspended and the angle of initial displacement are held constant. The results are presented in Table 2.

Table 2

Length (m)	Period (sec)
0.50	1.40
1.00	1.98
2.00	2.81

Experiment 3

The experimenter varied the angle of initial displacement. The length of wire and the amount of mass suspended are held constant. The results are presented in Table 3.

Table 3

Angle	Period (sec)
2°	1.41
3°	1.39
4°	1.40

Experiment 4

The experimenter used the same procedure to measure the period of a single pendulum three times in a row without changing any of the variables. This is to determine the precision with which this experimental procedure can determine the period of a pendulum. The results are presented in Table 4.

Table 4

Trial	Period (sec)
1	1.98
2	1.97
3	1.99

23. A 4-kg mass is suspended from a string with a length of 0.5 m and released from an initial displacement angle of 2°. Which of the following is the best estimate for the resulting period of this pendulum?
- A. 0.35 sec
 B. 0.70 sec
 C. 1.40 sec
 D. 2.82 sec
24. A student is asked to estimate the length of wire used in Experiment 3. Based on the results of all the experiments, the student correctly concludes that the length of the wire used in Experiment 3:
- F. is about 0.5 m.
 G. is about 1.0 m.
 H. is about 2.0 m.
 J. cannot be determined with the data available.

25. Which of the following variables was(were) *directly* controlled by the experimenter in at least one of the experiments?
- The amount of mass suspended
 - The period of oscillation
 - The length of wire
 - The initial displacement angle
- A. II only
B. I, II, and III only
C. I, II, and IV only
D. I, III, and IV only
26. In the preceding experiments the period of a pendulum was determined by measuring the time required for the pendulum to complete 50 oscillations and dividing that time by 50 to obtain the period. What experimental advantage is gained by timing 50 oscillations as opposed to timing a single oscillation?
- The effect of air resistance is maximized.
 - The effect of air resistance is minimized.
 - Systematic errors in timing are reduced.
 - The longer one counts, the more lasting the results produced.
27. On the basis of all the experiments, one could conclude that the period of a pendulum is NOT affected by which of the following variables?
- Amount of mass suspended
 - Length of wire used
 - Angle of initial displacement
- A. III only
B. I and II only
C. II and III only
D. I and III only
28. Four pendulums, consisting of the following masses suspended from the corresponding lengths of wire, are released from the angles listed. Which of the following listed below will display the most similar periods of oscillation?
- $M = 3 \text{ kg}$, $L = 2 \text{ m}$, released at 2°
 - $M = 9 \text{ kg}$, $L = 2 \text{ m}$, released at 3°
 - $M = 3 \text{ kg}$, $L = 4 \text{ m}$, released at 3°
 - $M = 3 \text{ kg}$, $L = 3 \text{ m}$, released at 3°
- F. I and II only
G. I and IV only
H. II and III only
J. III and IV only

Passage VI

Most plants require specific substances known as minerals to grow and reproduce. The following table provides a list of the minerals essential to flowering plants and a description of their functions. The first seven listed are called *macronutrients*, since they are present in large quantities in the plants. The other minerals are called *micronutrients* because they are often present in trace amounts. The number of pounds of each mineral required to grow 100 bushels of corn is also depicted in the table.

Element	Amount needed to grow 100 bushels of corn (lbs)	Function
Macronutrients:		
Calcium	50	Influences permeability of membranes; component of pectic salts in middle lamellae and necessary for cell wall formation; activator for several enzymes
Iron	2	Activation of porphyrins to form hemes which are contained in cytochromes, peroxidases, catalases, and some other enzymes
Magnesium	50	Structural component of chlorophyll; cofactor for many enzymes involved in carbohydrate metabolism
Nitrogen	160	Structural component of amino acids, nucleic acids, many hormones and coenzymes, etc.
Potassium	125	Essential to a vast number of plant functions, but its exact role is not well understood
Phosphorus	40	Structural component of nucleic acids, phospholipids, ATP, coenzymes, etc.
Sulfur	75	Structural component of some amino acids, vitamins, and enzymes, etc.
Micronutrients:		
Boron	0.06	Function unknown; may play a role in translocation of sugar; perhaps necessary for utilization of calcium in cell wall formation
Copper	Trace	Structural component of many enzymes that catalyze oxidation reactions
Chlorine	0.06	Function unknown
Manganese	0.3	Cofactor for many enzymes involved in cellular respiration, photosynthesis, and nitrogen metabolism
Molybdenum	Trace	Structural component of the enzyme that reduces nitrate to nitrite; essential for fixation of nitrogen and nitrogen-fixing bacteria
Sodium	0.06	Function unknown
Zinc	Trace	Necessary for synthesis of tryptophan (a precursor of auxin); component of the enzyme that catalyzes the decomposition of carbonic acid to CO ₂ and H ₂ O; may be a cofactor for some enzymes involved in the oxidation of carbohydrates

Table adapted from William T. Keeton, *Biological Science*. ©1980 by W. W. Norton & Company.

29. According to the information presented in the table, flowering plants require iron in order to:
- A. fix nitrogen.
 - B. activate porphyrins.
 - C. utilize calcium.
 - D. synthesize chlorophyll.
30. A scientist hypothesized that some minerals are required in minute quantities and are used as components of enzymes by flowering plants. The data for which of the following minerals would support this hypothesis?
- F. Calcium
 - G. Phosphorus
 - H. Sodium
 - J. Zinc
31. A botanist in South America found a new variety of corn identical to the type described in the table with the exception that it utilizes copper, instead of iron, in activating porphyrins. Approximately how many pounds of copper would you predict would be required to grow 100 bushels of this new corn?
- A. 0.3 lb
 - B. 2.0 lb
 - C. 4.0 lb
 - D. 50.0 lb
32. Which of the following conclusions about the mineral requirements of flowering plants is consistent with the data presented in the table?
- F. Plants require larger amounts of minerals than are available in the soil.
 - G. Plants require some minerals whose functions remain unknown.
 - H. Deficiencies of certain minerals have little, if any, effect on plant growth.
 - J. The addition of minerals to the soil in the form of fertilizer results in a smaller yield of corn.
33. A researcher using the table concluded that minerals used as components of enzymes and as cofactors for enzymes are required in very small amounts. This is supported by the information given for all of the following elements EXCEPT:
- A. magnesium.
 - B. manganese.
 - C. molybdenum.
 - D. zinc.

Passage VII

Rock layers containing fossils (remains of past life) can give clues to the past. Those fossils in older (lower) layers can be compared to those in younger (higher) layers. This comparison often shows that life forms have changed over a period of time. Scientists who study fossils hypothesize that those changes occurred as a result of *evolution*. Evolution theory suggests that more recent forms have their origin in earlier forms and that the differences between them are due to changes in successive generations, resulting in new species. Two mechanisms have been proposed to explain how these changes occur over time.

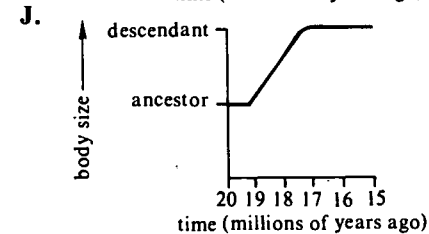
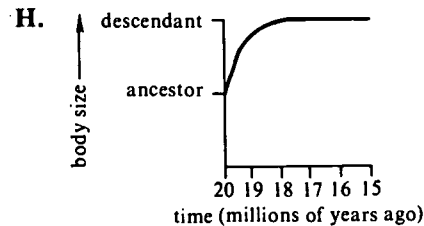
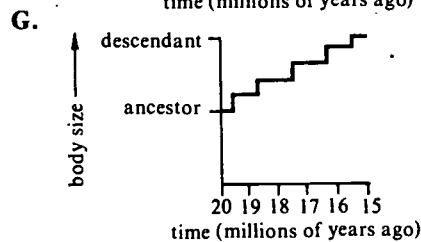
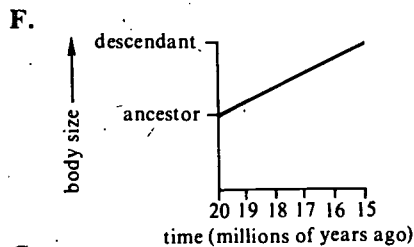
Gradualism

This theory says the changes occur slowly, steadily, and gradually, in response to environmental changes. The entire species is transformed over millions of years into a new species by accumulating small changes over the generations. This happens over the entire geographic range of the species. The fossil record should show long sequences of intermediate forms leading from earlier to later forms. If no intermediate forms are found, gradualists claim it is due to the incompleteness of the fossil record. Either no rocks were deposited during that period, those that were have been eroded away, or conditions were such that no fossils were formed.

Episodic Evolution

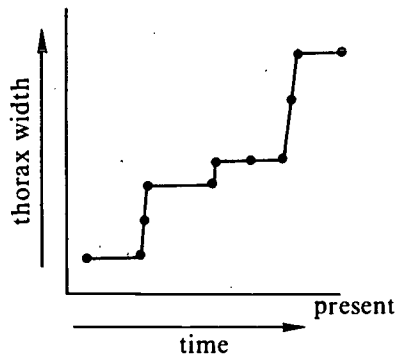
Some scientists suggest that the changes in life forms are *episodic* (changing at irregular intervals). New species appear when small subpopulations of the earlier form become isolated in a small area, usually on the margin of the ancestor's *geographic range* (the region throughout which an organism naturally occurs). Different environmental conditions there cause rapid changes in this isolated population, and, in a few thousand years, a new species may form. In the small area, where the isolated population existed, the record should show sudden replacement of ancestor by descendant, without intermediate forms. Once formed, a new species should not show much change. Most evolution is concentrated in episodes that are brief compared to the time period in which the species existed.

34. Suppose that during the evolution of a new species from its ancestor, the average body size doubled. Samples of the ancestor and descendant are taken from rocks 20 and 15 million years old, respectively. Which of the following graphs of body size versus time best expresses the views of Gradualism?



35. If the global climate were to change over the next few thousand years, becoming increasingly colder, which of the following would most likely take place according to the Episodic view?
- The entire population of most species would change to meet the needs of the new environment.
 - New species better adapted to the environment would develop from small subpopulations, while some of the rest would go extinct.
 - No response to this climatic change would occur.
 - The entire population of most species would go extinct.

36. The graph below shows the evolution of a species of microscopic organism known as a radiolarian. Width of the *thorax* (the central part of the body) is plotted versus time. Which view of evolution is supported by these results and why?



- F. Gradualism, because there is an overall increase in the width of the thorax through time.
- G. Gradualism, because the width is constantly changing.
- H. Episodic Evolution, because times of little change alternate with times of rapid change.
- J. Episodic Evolution, because reversals in the direction of change occur.
37. Which of the following hypotheses about the relationship between generation length and evolutionary rate would be consistent with the views of Gradualism?
- A. Organisms with short generation lengths should evolve faster than those with long ones.
- B. Organisms with long generation lengths should evolve faster than those with short ones.
- C. Generation length should affect rate of evolution only for animals.
- D. Generation length should affect rate of evolution only for plants.
38. Mutations, which are changes in the hereditary material of an organism, are responsible for the relatively rapid appearance of new traits. Which of the following statements about mutation would be consistent with the views of Gradualism?
- F. Mutations that produce large changes in organisms are usually harmful and do not survive within a population.
- G. Mutations that produce large changes in organisms are usually helpful and spread quickly throughout the population.
- H. Most organisms have very high rates of mutation.
- J. Most mutations create visible changes in an organism that can be seen within a short time period.
39. The clam *Cerastoderma* includes four species that live in the Atlantic Ocean. Dozens of other species of this clam have been found in deposits from the Pontian seas, brackish bodies of water once connected to the Mediterranean Sea. It would NOT be consistent with the Episodic view to hypothesize that there are more species in the Pontian seas because:
- A. there are more opportunities for isolation of subpopulations.
- B. individual populations there are smaller.
- C. they have had a long time for slow changes to accumulate.
- D. environmental conditions vary from place to place.
40. Foraminifera (single-celled animals with microscopic shells) are thought to evolve primarily by Gradualism. These organisms live in the open ocean, floating on water currents. Why might these organisms be expected to evolve by Gradualism rather than by Episodic Evolution?
- F. Because there are few opportunities for subpopulations to become isolated
- G. Because the ocean environment changes rapidly over time
- H. Because the ocean environment is constantly changing
- J. Because they are single-celled

END OF TEST 4

STOP! DO NOT RETURN TO ANY OTHER TEST.

Scoring Your Practice Test

How to Score the Practice 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 practice 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 67 on one form of the English Test, for example, may be about as difficult to earn as a raw score of 70 on another form of that test.

To compute your raw scores, check your answers with the scoring keys on pages 57–59. Count the number of correct answers for each of the four tests and seven subscore areas, and enter the number 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 practice test, use the score conversion tables on pages 60–61. Table 1 on page 60 shows the raw-to-scale score conversions for the total tests, and Table 2 on page 61 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 practice test would not be expected to match precisely the scale scores received from a national administration of the ACT Assessment.

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 college-bound students who take the ACT.

The norms table (Table 3 on page 62) enables you to compare your scores on the sample test with the scores of recent high school graduates who tested as 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 51. This means that 51% of the ACT-tested juniors and seniors had a Composite score of 20 or lower.

Remember that your scores and percent at or below on the sample test 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 Practice Test

After you have determined your scale scores, consider the following as you evaluate how you did on the practice test.

- Did you run out of time before you completed a test? If so, reread the information in this booklet on pacing yourself. 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. Remember there is no penalty for guessing.
- 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 practice 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 practice 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 Practice Test

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

Test 2: Mathematics—Scoring Key

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

Number Correct (Raw Score) for:	
Pre-Alg./Elem. Alg. (EA) Subscore Area	_____ (24)
Inter. Alg./Coord. Geo. (AG) Subscore Area	_____ (18)
Plane Geo./Trig. (GT) Subscore Area	_____ (18)
Total Number Correct for Math Test (EA + AG + GT)	_____ (60)

* EA = Pre-Algebra/Elementary Algebra
 AG = Intermediate Algebra/Coordinate Geometry
 GT = Plane Geometry/Trigonometry

TABLE 1

**Procedures Used to Obtain Scale Score
From Raw Scores for the ACT Practice Test**

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 response 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	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.

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

TABLE 2

ACT Test _____ **Your Scale Subscore** _____

English _____
 Usage/Mechanics (UM) _____
 Rhetorical Skills (RH) _____
Mathematics _____
 Pre-Algebra/Elem. Algebra (EA) _____
 Inter. Algebra/Coord. Geometry (AG) _____
 Plane Geometry/Trigonometry (GT) _____
Reading _____
 Social Studies/Sciences (SS) _____
 Arts/Literature (AL) _____

**Procedures Used to Obtain Scale Subscores
 From Raw Scores for the ACT Practice Test**

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.

Scale Subscore	Raw Scores										Scale Subscore
	Test 1 English		Test 2 Mathematics			Test 3 Reading			Arts/ Literature	Social Studies/ Sciences	
	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	20	20	20	20	18
17	38	—	22-23	17	—	19	19	19	19	19	17
16	36-37	33-34	21	16	17	18	18	18	18	18	16
15	34-35	32	20	14-15	16	17	17	17	17	17	15
14	32-33	30-31	18-19	13	14-15	16	16	16	16	—	14
13	30-31	28-29	17	11-12	13	15	15	15	15	16	13
12	28-29	26-27	15-16	10	11-12	13-14	13-14	13-14	13-14	15	12
11	26-27	24-25	14	08-09	10	12	12	12	12	14	11
10	24-25	22-23	12-13	07	09-10	11	11	11	11	13	10
9	22-23	19-21	10-11	05-06	08-09	09-10	09-10	09-10	09-10	12	9
8	19-21	16-18	09	04	06-07	08	08	08	08	11	8
7	17-18	14-15	07-08	03	05	07	07	07	07	09-10	7
6	15-16	12-13	06	—	04	06	06	06	06	08	6
5	12-14	09-11	04-05	02	03	05	05	05	05	07	5
4	09-11	07-08	03	—	02	04	04	04	04	06	4
3	07-08	05-06	02	01	01	03	03	03	03	05	3
2	05-06	03-04	01	—	—	02	02	—	—	03-04	2
1	00-04	00-02	00	00	00	00-01	00-01	00	00	00-02	1



TABLE 3
Norms Table for the ACT Practice Test

Use the norms table below to determine your estimated percent at or below for each of your scale scores.

In the far left column, circle your scale score for the English Test (from page 60). Then read across to the percent at or below column for that test; circle or put a check mark beside the corresponding percent at or below. Use the same procedure for each test (from page 60) and subscore area (from page 61). You may find it easier to use the right column of scale scores for your Science Reasoning Test and Composite scores.

As you mark your percents at or below, enter them in the blanks provided at the right.

You may also find it helpful to compare your performance with the national mean (average) score for each of the four tests, subscore areas, and the Composite as shown at the bottom of the norms table.

ACT Test	Percent At or Below on Practice Test
English	
Usage/Mechanics	_____
Rhetorical Skills	_____
Mathematics	
Pre-Algebra/Elem. Alg.	_____
Alg./Coord. Geometry	_____
Plane Geometry/Trig.	_____
Reading	
Soc. Studies/Sciences	_____
Arts/Literature	_____
Science Reasoning	_____
Composite	_____

National Distributions of "Percent At or Below" for ACT Test Scores 1995 HS Graduates Tested on National Test Dates													
Score	ENGLISH	Usage/Mechanics	Rhetorical Skills	MATHEMATICS	Pre-Algebra/Elem. Alg.	Alg./Coord. Geometry	Plane Geometry/Trig.	READING	Soc. Studies/Sciences	Arts/Literature	SCIENCE REASONING	COMPOSITE	Score
36	99			99				99			99	99	36
35	99			99				99			99	99	35
34	99			99				98			99	99	34
33	99			99				96			99	99	33
32	99			99				95			99	99	32
31	99			99				94			98	99	31
30	98			97				92			97	98	30
29	96			96				90			96	96	29
28	93			93				88			94	94	28
27	90			91				85			91	91	27
26	87			88				80			88	87	26
25	82			84				76			84	83	25
24	76			80				72			80	78	24
23	71			75				66			73	72	23
22	65			69				61			65	66	22
21	60			64				54			58	58	21
20	53			58				47			49	51	20
19	47			51				41			40	42	19
18	40	99	99	43	99	99	99	33	99	99	31	34	18
17	33	99	99	34	98	99	98	28	98	96	24	26	17
16	27	97	98	25	95	98	98	23	95	91	16	19	16
15	21	92	96	17	92	96	97	18	91	85	10	13	15
14	15	87	92	10	86	92	93	14	86	78	06	08	14
13	11	81	84	05	81	87	85	10	80	70	03	04	13
12	07	73	76	02	73	81	78	07	73	61	01	02	12
11	04	66	64	01	64	73	67	04	64	52	01	01	11
10	02	56	53	01	54	60	53	02	53	43	01	01	10
09	01	46	41	01	44	45	39	01	41	35	01	01	09
08	01	36	28	01	31	27	27	01	27	28	01	01	08
07	01	25	17	01	20	17	14	01	17	21	01	01	07
06	01	15	09	01	12	11	07	01	10	14	01	01	06
05	01	08	04	01	05	06	06	01	05	08	01	01	05
04	01	03	01	01	02	04	03	01	03	05	01	01	04
03	01	01	01	01	01	02	02	01	02	02	01	01	03
02	01	01	01	01	01	01	01	01	01	01	01	01	02
01	01	01	01	01	01	01	01	01	01	01	01	01	01
MEAN	20.2	10.1	10.4	20.2	10.4	10.0	10.3	21.3	10.5	11.1	21.0	20.8	
S.D.	5.3	3.4	2.9	4.9	3.3	3.0	3.0	6.0	3.3	3.9	4.6	4.6	

Note: These norms are the source of national and state norms printed on ACT Assessment score reports during the 1995-96 testing year. Sample size: 945,369.

You may wish to remove this sample answer sheet from the booklet to use in

ACT ASSESSMENT 1996-97 National Answer Sheet

SIDE 1

A NAME, ADDRESS, AND TELEPHONE (Please print.)

Last Name _____ First Name _____ MI (Middle Initial) _____

House Number and Street _____ State _____ ZIP Code _____

City _____ Number _____ Area Code _____



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MATCHING INFORMATION

Enter the information in blocks B, C, and D, EXACTLY as it appears on your test center admission ticket, even if any part of this information is missing or incorrect. Fill in the corresponding ovals. Leave block E blank unless you are given special instructions.

F NAME CORRECTION

Last Name	First Name	MI
<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/> I <input type="checkbox"/> J <input type="checkbox"/> K <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/> Q <input type="checkbox"/> R <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> U <input type="checkbox"/> V <input type="checkbox"/> W <input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/> I <input type="checkbox"/> J <input type="checkbox"/> K <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/> Q <input type="checkbox"/> R <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> U <input type="checkbox"/> V <input type="checkbox"/> W <input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/> I <input type="checkbox"/> J <input type="checkbox"/> K <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/> Q <input type="checkbox"/> R <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> U <input type="checkbox"/> V <input type="checkbox"/> W <input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z

G SOCIAL SECURITY NUMBER CORRECTION

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H DATE OF BIRTH CORRECTION

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I HIGH SCHOOL CODE CORRECTION

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TEST 1

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

TEST 2

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

TEST 3

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

TEST 4

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

I hereby certify that I have truthfully identified myself on this form. I understand that the consequences of falsifying my identity include cancellation of my scores.

Your Signature

Today's Date

