

EXPLORE[®] PLAN[®] THE ACT

ABBREVIATED TEST BOOKLET

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This booklet provides sample test questions from each of the four multiple-choice content areas measured by the EXPLORE, PLAN, and ACT Tests:

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**Abbreviated
EXPLORE
Test**

TEST 1: ENGLISH TEST

DIRECTIONS: In the passage that follows in this abbreviated version of the test, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the 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. Sometimes the paragraphs or the sentences of a paragraph will be numbered and referred to in these questions.

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

PASSAGE I

The Boise Nature Center

[1] In Boise, Idaho, a waterfall spills into a rocky pool, then forms a clear mountain stream. [2] The stream becomes a river and twisted across a semi-arid plateau.

[3] From there the river wanders through farmland and then vanishes underground. [4] Amazingly, all of this river’s activity takes place within the shadow of tall office buildings a few feet from a city park. [5] The river, you see, is the centerpiece of Boise’s Nature Center. [6] When at last it surfaces, it falls from a rock cliff into wetlands. 2

The Center reproduces four environmental systems found in Idaho; the heart of each is the river. Although it travels only 550 feet, ducks, geese, mink, squirrels, and quail call home. Keeping them company are fish:

salmon, sturgeon, bass, and trout. And the fish, more than anything else, draw visitors to the Center.

1. A. NO CHANGE
B. has twisted
C. twists
D. twisting

2. For the sake of unity and coherence, Sentence 6 should be placed:
F. where it is now.
G. before Sentence 2.
H. before Sentence 3.
J. before Sentence 4.

3. A. NO CHANGE
B. are
C. call it
D. call for

4. F. NO CHANGE
G. like everything else,
H. similar to everything,
J. like anything,

For a fish-eye view of the world, peer through an underwater window. Fat rainbow trout patrol between⁵ territory, chasing smaller fish from prime feeding areas. In the tangles of a sunken log, a three-foot-long sturgeon floats, motionless. At the bottom, naturally vacuuming⁶ cleaner—the sucker—feeds on algae and waste.

Step to another window and suddenly you're alongside the spawning grounds. Safe within "redds" (shallow gravel nests), tiny eggs bob in the current.

Look more closer⁷ for a dark dot in the orange egg. If you come back in two weeks, the dot will be an eye,

the egg will have a tail, and a witness⁸ for the first

stages of a trout's⁹ life.

Built entirely with volunteer labor and paid for by donations, the Boise Nature Center is unique. Plenty of cities have aquariums. Others have zoos. Still others have wildlife refuges. Only Boise has blended them all together in a fascinating and educational mix.

- 5. A. NO CHANGE
B. their
C. his
D. in
- 6. F. NO CHANGE
G. nature vacuum
H. natures' vacuum
J. nature's vacuum
- 7. A. NO CHANGE
B. closely
C. most closer
D. in closing
- 8. F. NO CHANGE
G. then witness
H. you'll have witnessed
J. witness
- 9. A. NO CHANGE
B. stage's of a trout's
C. stage's of a trout
D. stages for a trouts

Question 10 asks about the preceding passage as a whole.

- 10. The writer has been asked to write an essay that would be part of a brochure on enjoyable things to do and see in Boise, Idaho. Would this essay successfully fulfill that assignment?
 - F. Yes; the essay focuses on mammals, which are apparently of the greatest interest for visitors at the Boise Nature Center.
 - G. Yes; the essay employs a lot of vivid descriptions of animals and fish that visitors to Idaho can see in zoos in cities across the U.S.
 - H. Yes; the essay provides a concise and informative description of one of Boise's attractive facilities.
 - J. No; the essay does not tell readers how much it costs to go to the Center or how crowded the Center typically is.

END OF TEST 1

TEST 2: MATHEMATICS TEST

DIRECTIONS: Solve each problem in this abbreviated version of the test, choose the correct answer, and then circle that answer in the test booklet.

Do not use too much time on any one problem. Solve the ones you can do quickly; then return to the others in the time you have left.

You should have a calculator to use for 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 the problem states otherwise, you should assume all of the following.

1. Diagrams 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. For example, the average of 2, 6, and 7 is $\left(\frac{2 + 6 + 7}{3}\right)$.

[The space for figuring is for your convenience only. Such space is not provided in an actual EXPLORE test booklet.]

1. What is the remainder when 189,540 is divided by 27 ?

- A. 0
- B. 7
- C. 13
- D. 250
- E. 7,020

DO YOUR FIGURING HERE.

2. What is the least expensive shower head on the chart below that will NOT deliver more than 3 gallons of water per minute (gpm)?

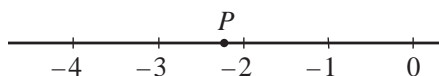
Information from *Consumer Reports*, "How to Save Water."
©1990 by Consumers Union of U.S., Inc.

| <u>Brand and Model</u> | <u>Price</u> | <u>Maximum gpm</u> |
|------------------------|--------------|--------------------|
| F. Sears 20173 | \$23 | 3.4 |
| G. Teledyne 5 SM-3U | \$43 | 2.6 |
| H. Alsons 462PB | \$11 | 2.6 |
| J. Alsons 45C | \$58 | 2.7 |
| K. Moen 3981 | \$95 | 2.4 |

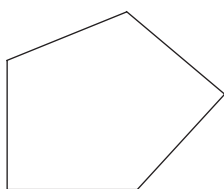
3. If $x = 23$, then $[4 \times (69 \div x)] + 2x = ?$

- A. 49
- B. 58
- C. 226
- D. 230
- E. 235

4. What is the coordinate of point P shown on the real number line below?



- F. $-3\frac{3}{4}$
 G. $-3\frac{1}{4}$
 H. $-2\frac{3}{4}$
 J. $-2\frac{1}{4}$
 K. -2
5. The length of each side of the pentagon shown below is 17 millimeters. What is the perimeter of the pentagon in millimeters?



- A. 22
 B. 44
 C. 68
 D. 85
 E. 102
6. Carmen was excited about the possibility of earning the “Mayfield Math Award.” In order to do this she must have an average score of at least 92 on her first 5 tests. If her first 4 scores were 96, 90, 89, and 97, what is the lowest possible score Carmen could have on the 5th test and still earn the award?
- F. 88
 G. 89
 H. 90
 J. 91
 K. 92
7. Kane bought a bag of taffy at the candy store. He got 10 vanilla for his mom, 15 chocolate for his dad, 6 licorice for his sister, and 22 peppermint for himself. On the way home, Kane’s sister grabbed a piece out of the sack without looking. What are the chances that she pulled out a licorice piece?
- A. $\frac{1}{6}$
 B. $\frac{6}{6}$
 C. $\frac{6}{47}$
 D. $\frac{6}{53}$
 E. $\frac{47}{53}$

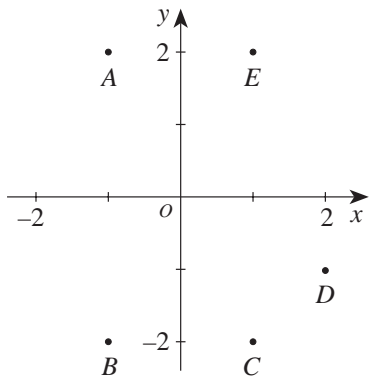
DO YOUR FIGURING HERE.

8. A prime number is a whole number greater than 1 that has only 1 and itself as factors. All other whole numbers greater than 1 are considered composite. Which of the following is true of the number 51?
- F. 51 is prime because it has no factors other than 1 and 51.
 - G. 51 is prime because it is an odd number.
 - H. 51 is composite because it has 3 as a factor.
 - J. 51 is composite because it has 13 as a factor.
 - K. It is not possible to tell whether 51 is prime or composite.

9. Which of the following numbers is the greatest?

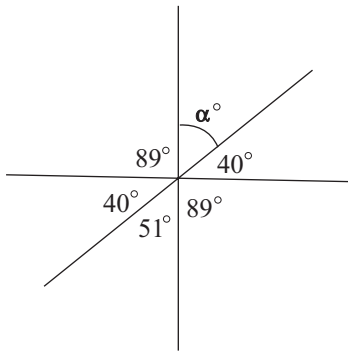
- A. $0.\overline{2324}$
- B. $0.\overline{23}2\overline{4}$
- C. $0.23\overline{24}$
- D. $0.232\overline{4}$
- E. 0.2324

10. One of the points, labeled *A* through *E*, shown in the standard (x,y) coordinate plane below has coordinates $(-1,2)$. Which point is it?



- F. *A*
- G. *B*
- H. *C*
- J. *D*
- K. *E*

11. What is α° in the figure below?



- A. 40°
- B. 50°
- C. 51°
- D. 60°
- E. 140°

12. At the movie theater, popcorn costs \$1.75 per bucket, soft drinks cost \$1.50 each, and the price of admission is \$3.75 for all ages. If x is the number of people who buy 1 ticket, 1 bucket of popcorn, and 1 soft drink, which of the following is an expression for the total number of dollars spent at the movie theater by the x people?

- F. $3.25x$
- G. $3.75x$
- H. $3.25 + 3.75x$
- J. $3.25x + 3.75$
- K. $7x$

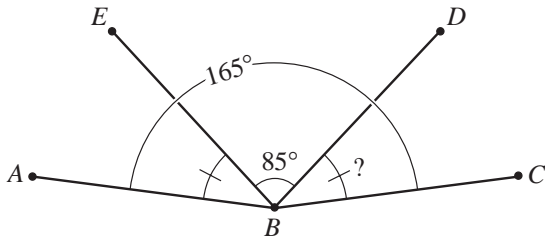
13. If $x = 0.7$, which of the following values of y makes the equation below true?

$$5x + y^2 = 9.75$$

- A. 2.5
- B. 3.125
- C. 3.14
- D. 4.05
- E. 6.25

DO YOUR FIGURING HERE.

14. In the figure below, the measure of $\angle ABD$ is equal to the measure of $\angle EBC$. Also, the measure of $\angle ABC$ is 165° and the measure of $\angle DBE$ is 85° . What is the measure of $\angle DBC$?



- F. 40°
G. $42\frac{1}{2}^\circ$
H. 45°
J. 50°
K. 55°
15. Paco wants to redecorate his room. On one wall he wants to put up new wallpaper. The wall is a 13-by-11-foot rectangle and has a door which takes up a 7-by-3-foot rectangular area. After the area of the door is subtracted, how many square feet of wall remain to be covered?
- A. 28
B. 48
C. 122
D. 143
E. 288

DO YOUR FIGURING HERE.

END OF TEST 2

TEST 3: READING TEST

DIRECTIONS: There is one passage in this abbreviated version of the test. The passage is followed by several questions. After reading the passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passage as often as necessary.

Passage I

SOCIAL SCIENCE: This passage is adapted from the article “Land of the Candy Bar” by Ray Broekel (©1986 by Forbes Inc.).

The candy bar as we know it was born in America. So too, many centuries earlier, was chocolate itself. Mexican natives cultivated the cocoa bean for more than twenty-five hundred years before Hernán Cortés took it to Spain with him in 1528. Spanish royalty drank a cold, sweetened beverage made from the beans, but they liked it so much they kept it a secret from the rest of Europe for the remainder of the century. Not until the 1840s did a British firm make the first chocolate bar. The *candy* bar, agglomerating a variety of flavors and textures—almost always including chocolate—in one piece, was a purely American invention, and (as of this writing) it’s still not one hundred years old.

Milton Snavely Hershey, the father of the modern candy bar, had already built a successful business in caramels when he first saw German chocolate-making machines at the 1893 Chicago world’s fair. He ordered some for his factory in Lancaster, Pennsylvania, and began turning out chocolate bars the next year. By the turn of the century he was through with caramels. He made not just plain chocolate and milk-chocolate bars but also innovative items like almond bars, kisses, and chocolate cigars. By 1911 his company had sales of five million dollars a year; by 1921 it was making four times that.

Such dazzling success begat swift competition, and soon a multitude of companies was making bars of chocolate combined with caramel, marshmallow, peanuts, crisped rice, and anything else that might sell.

30 Throughout the first two decades of the century, a bewildering variety of candy bars appeared on shelves across the country, most of them fleetingly. There have probably been more than one hundred thousand different candy bars sold in the United States, including some 35 thirty thousand that existed only in the years just after World War I. Nearly every confectioner in the land turned out a candy bar, choosing a name that might reflect a news or sports event, a popular hero, a food, a place, or even a popular saying of the age.

40 The industry began on the East Coast but quickly fanned out across the country. Since the basic ingredients were dairy products, Chicago became the natural hub for candy bars, and Milwaukee and Minneapolis were major producers.

45 The Depression brought lean times to the candy-bar business, and not until the late 1930s did the industry begin to recover. When war struck again, the makers of candy bars once more were pressed into service supplying the troops. Hershey made “field ration D,” a 50 refined chocolate that didn’t melt at high temperatures, and it was packed in kits for soldiers, sailors, and Marines. On the home front, as the supply of chocolate dwindled, manufacturers struggled to concoct new bars from ingredients such as peanuts and marshmallows and 55 gave them patriotic names like Torpedo.

If World War I made candy bars a major industry, World War II made them a worldwide symbol of America. The GI handing out candy bars to children came to stand for liberation everywhere. Hershey bars 60 became an international wartime currency.

1. The passage mentions all of the following as candy-bar ingredients EXCEPT:
 - A. crisped rice.
 - B. caramel.
 - C. raisins.
 - D. almonds.
2. What, according to the passage, did Hernán Cortés contribute to the development of the candy bar?
 - F. He introduced the cocoa bean to Spain.
 - G. He protected the secret of cocoa from the abuses of Europe.
 - H. He discovered the cocoa bean growing wild in Mexico.
 - J. He utilized chocolate as an international currency.
3. Why, according to the passage, did Chicago become the hub for candy-bar production?
 - A. It was located at the midpoint between Minneapolis and Lancaster, Pennsylvania.
 - B. It was the transportation center of the U.S.
 - C. The majority of the population was found in this part of the country.
 - D. Many dairy products came from the region around Chicago.
4. As it is used in line 32, the word *fleetingly* means:
 - F. of poor quality.
 - G. lasting only a brief time.
 - H. similar in taste.
 - J. becoming permanent.
5. The main idea of the passage is that:
 - A. chocolate has been in use since the sixteenth century.
 - B. chocolate, a symbol of royalty, was kept a secret for a long time.
 - C. the candy bar has come to occupy an important place in American life.
 - D. the candy bar played a part in the outcomes of the two world wars.
6. According to the passage, which of the following historical events helped to stimulate demand for the chocolate- and candy-bar industry?
 - I. World War I
 - II. World War II
 - III. The Depression
 - F. I only
 - G. I and II only
 - H. I and III only
 - J. II and III only
7. It can most reasonably be inferred from the passage that by the turn of the century Hershey was “through with caramels” (line 20) because:
 - A. he saw a larger market for chocolate bars.
 - B. they didn’t work in his new chocolate-making machines.
 - C. too many other companies were competing for their sales.
 - D. their taste clashed with the chocolate he had begun to use.
8. The passage indicates that the first chocolate bar was made by the:
 - F. Mexicans.
 - G. Spanish.
 - H. British.
 - J. Americans.
9. According to the passage, where did Milton Snavely Hershey learn about chocolate making?
 - A. At a German chocolate-making factory
 - B. At his own plant in Lancaster, Pennsylvania
 - C. At a British chocolate-bar factory
 - D. At the 1893 Chicago World’s Fair
10. The passage indicates that candy bars have been named after all of the following EXCEPT:
 - F. patriotic things.
 - G. wartime currency.
 - H. popular sayings.
 - J. sporting events.

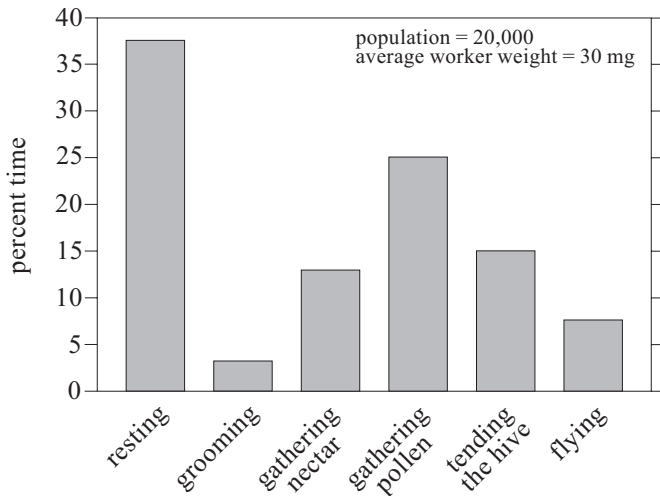
END OF TEST 3

TEST 4: SCIENCE TEST

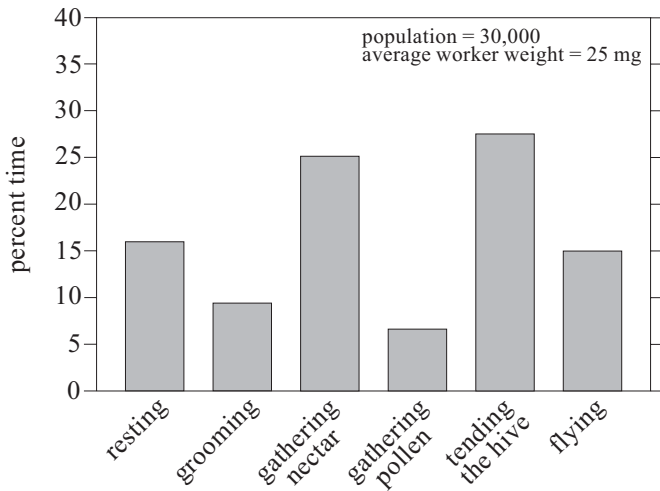
DIRECTIONS: There are two passages in this abbreviated version of the test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passages as often as necessary.

Passage I

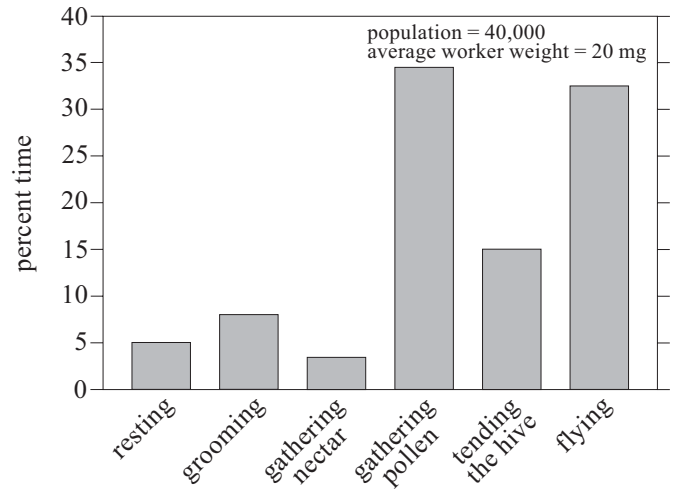
Observations of three different beehives were made over a two-week period in the spring. The hives were located in different areas containing blooming flowers. The activities of the worker bees were observed for each hive at the same time of day for each day during the study period. The population and average weight of the worker bees in each hive were also determined. The data obtained from this study are displayed in the following figures, identified as Hive 1, Hive 2, and Hive 3.



Hive 1



Hive 2



Hive 3

- According to the data for Hive 1, one can conclude that the bees spend more time flying than:
 - resting.
 - grooming.
 - gathering pollen.
 - tending the hive.
- According to the data presented for Hive 3, the percentage of time spent by the worker bees tending the hive was approximately:
 - 10%.
 - 15%.
 - 20%.
 - 35%.
- According to the figures, the greatest percentage of time spent by worker bees in gathering nectar is approximately:
 - 10%.
 - 15%.
 - 25%.
 - 35%.

4. According to the figures, what is the relationship between the weight of the individual worker bees and the amount of time spent flying?

- F. The lighter the bee, the more time spent flying.
- G. The heavier the bee, the more time spent flying.
- H. Lighter bees are faster, so less time is spent flying.
- J. Heavier bees are faster, so less time is spent flying.

Passage II

Several factors affect the *rate* (how fast the chemicals react) at which a chemical reaction proceeds. Reaction rate is affected by the *concentrations* (relative amounts per unit volume) of the chemicals being reacted and the temperature at which the reaction takes place. The addition of a *catalyst* (substance that affects the rate of a reaction without itself being used up) can also increase the reaction rate.

When Solutions A and B (two colorless liquids) are mixed, a reaction takes place. When the reaction is completed, the mixture turns dark blue.

Experiment 1

Students mixed 20 mL each of Solutions A and B at 22.2°C, and stirred the mixture as the reaction proceeded. The students recorded the time that it took for the mixture to turn dark blue. This was repeated 4 more times. The average time for the 5 trials was 29 seconds (sec).

The students then mixed 20 mL of Solution A, 10 mL of Solution B, and 10 mL of distilled water, all at 22.2°C. The average reaction time for 5 trials was 71 sec.

The students then mixed 10 mL of Solution A, 10 mL of distilled water, and 20 mL of Solution B, all at 22.2°C. The average reaction time for 5 trials was 72 sec.

Experiment 2

The students mixed 20 mL each of Solutions A and B at 3 different temperatures. Each time, they stirred until the reaction was complete. The average reaction times for 5 trials are shown in the table.

| Temperature (°C) | Time until reaction was completed (sec) |
|------------------|---|
| 12.2 | 58 |
| 22.2 | 29 |
| 32.2 | 15 |

Experiment 3

The students added 5 drops of copper sulfate, a catalyst, to 20 mL of Solution A. When this was mixed at 22.2°C with 20 mL of Solution B, the average reaction time for 5 trials was 19 sec.

5. How is the experimental design of Experiment 1 different from that of Experiment 2 ?

- A. Experiment 1 varies the concentration of the solutions and Experiment 2 varies the temperature of the mixture.
- B. Experiment 1 varies the temperature of the mixture and Experiment 2 varies the concentration of the solutions.
- C. Experiment 1 varies the concentration of the solutions and Experiment 2 adds a catalyst.
- D. Experiment 1 adds a catalyst and Experiment 2 varies the temperature of the mixture.

6. Based on the results of Experiment 2, what is the relationship, if any, between the temperature of the mixture and the reaction time?

- F. As the temperature increases, the reaction time decreases only.
- G. As the temperature increases, the reaction time stays the same.
- H. As the temperature decreases, the reaction time increases, then decreases.
- J. There is no relationship between the temperature and the reaction time.

7. Which of the following indicated that the reaction was completed in the experiments?

- A. Solution A was added to Solution B.
- B. The two solutions were stirred.
- C. The mixed solutions turned clear and colorless.
- D. The mixed solutions turned dark blue.

8. Based on the results of Experiments 2 and 3, which of the following conditions would most likely lead to the longest reaction time?

- F. A reaction temperature of 50°C and the use of a catalyst
- G. A reaction temperature of 50°C and no catalyst
- H. A reaction temperature of 30°C and the use of a catalyst
- J. A reaction temperature of 10°C and no catalyst

9. Based on the results of Experiment 2, one would predict that if the reaction was repeated at 2.2°C, the reaction time would be approximately:

- A. 8 sec.
- B. 30 sec.
- C. 60 sec.
- D. 116 sec.

10. Which of the following conditions was directly changed by the students in Experiment 1 ?

- F. Total volume of the mixture
- G. Concentration of each solution in the mixture
- H. Temperature of the mixture
- J. Reaction rate

END OF TEST 4

Abbreviated EXPLORE Test Answer Key

| English Test | |
|--------------|--------|
| Question | Answer |
| 1 | C |
| 2 | J |
| 3 | C |
| 4 | F |
| 5 | B |
| 6 | J |
| 7 | B |
| 8 | H |
| 9 | A |
| 10 | H |

| Mathematics Test | |
|------------------|--------|
| Question | Answer |
| 1 | A |
| 2 | H |
| 3 | B |
| 4 | J |
| 5 | D |
| 6 | F |
| 7 | D |
| 8 | H |
| 9 | D |
| 10 | F |
| 11 | C |
| 12 | K |
| 13 | A |
| 14 | F |
| 15 | C |

| Reading Test | |
|--------------|--------|
| Question | Answer |
| 1 | C |
| 2 | F |
| 3 | D |
| 4 | G |
| 5 | C |
| 6 | G |
| 7 | A |
| 8 | H |
| 9 | D |
| 10 | G |

| Science Test | |
|--------------|--------|
| Question | Answer |
| 1 | B |
| 2 | G |
| 3 | C |
| 4 | F |
| 5 | A |
| 6 | F |
| 7 | D |
| 8 | J |
| 9 | D |
| 10 | G |

**Abbreviated
PLAN
Test**

1

ENGLISH TEST

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

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

PASSAGE I

An Extension of My Fingers

I learned to eat with chopsticks when I was seven years old. According to my grandparents, who were brought up in China, I was terribly old to be learning such a basic skill. "Children in China *never* eat with forks," my grandfather said. "Chinese children learn to eat with chopsticks from the beginning." 2

"Think of the chopsticks as an extension of your fingers," my grandmother advised. "You can learn to control them as well as you control your own fingers."

In my experience, though, the bamboo sticks were nothing like my fingers.

1. A. NO CHANGE
B. skill, "Children
C. skill "Children
D. skill "children
2. The writer is considering adding here the following sentence:
When he told me this, I was in the second grade.
Would this be a relevant addition to make?
F. Yes, because the sentence makes it clear that the narrator was older than most Chinese children are when they start using chopsticks.
G. Yes, because the sentence gives information that is necessary to understanding the paragraph that follows it.
H. No, because the sentence gives information that is similar to what has already been given earlier in the paragraph.
J. No, because the sentence should open the next paragraph, not conclude this paragraph.
3. Three of these choices are acceptable here. Which one is NOT acceptable?
A. NO CHANGE
B. Yet in my experience,
C. However, in my experience,
D. In my experience, therefore,

1

With a certain amount of clumsiness, I would manage to wedge a piece of food between the long, stiff chopsticks.

Then, as I rose the food to my mouth, the chopsticks would suddenly slip or shift beyond

control and that my dinner would land on the table with an embarrassing plop. For a long time, I could not finish a meal without creating greasy blotches around my plate.

As I began to try my new skill in Chinese restaurants, I discovered through necessity the different techniques required to manage the many types of chopsticks available. Each type presenting another challenge.

Bone chopsticks thick, and square, and heavy, were

considered appropriate for formal occasions but definitely were especially difficult for my childish

hands. When complaining to my grandmother, she said that the most difficult chopsticks of all had appeared a

thousand years ago in the emperors court.

4. Which choice would best emphasize the sense that the writer made a serious attempt to learn how to manipulate the chopsticks?

- F. NO CHANGE
- G. Through arduous concentration,
- H. An impatient person,
- J. Being considerate,

5. A. NO CHANGE
B. arose
C. raise
D. raised

6. F. NO CHANGE
G. control in which my dinner landed
H. control, and my dinner would land
J. control, and landing my dinner

7. A. NO CHANGE
B. available, each type presented
C. available. Each type presented
D. available. Each type having presented

8. F. NO CHANGE
G. chopsticks thick and square and heavy
H. chopsticks, thick and square and heavy,
J. chopsticks, thick square and heavy,

9. A. NO CHANGE
B. it was a fact that they were
C. it was
D. were

10. F. NO CHANGE
G. When I complained
H. I complained
J. Complaining

11. A. NO CHANGE
B. year's ago in the emperor's
C. years ago in the emperor's
D. years' ago in the emperors'

1

“In those ancient times,” my grandmother said, “the test for any woman wanting to marry a prince was to eat a meal of pigeon’s eggs with delicate silver chopsticks.” Managing the slippery, marble-sized eggs with the gleaming, pointed chopsticks required a sensitivity $\frac{12}{12}$ at that of most normal people. I knew then that I did not want to be a princess.

12. F. NO CHANGE
G. toward
H. in
J. beyond

Question 13 asks about the preceding passage as a whole.

13. Suppose the writer had chosen to write a brief essay about a particular experience from childhood that changed the way she viewed her grandparents. Would this essay successfully fulfill the writer’s goal?
- A. Yes, because the writer realized that her grandparents wanted her to experience Chinese culture.
 - B. Yes, because the writer suddenly saw that her grandparents were more strict than her parents.
 - C. No, because the essay indicates that the writer was unable to learn what her grandparents were trying to teach her.
 - D. No, because the essay gives no indication that the relationship between the writer and her grandparents changed in any way.

END OF TEST 1

2

MATHEMATICS TEST

DIRECTIONS: Solve each problem in this abbreviated version of the test, choose the correct answer, and then circle that answer in the test booklet.

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. Ten boxes of books were delivered to the school library. There were 50 books in each box, except for the last box, which contained only 40 books. How many books did the library receive in this delivery?

- A. 50
- B. 450
- C. 490
- D. 500
- E. 540

DO YOUR FIGURING HERE.

2. In a 1-week period in St. Louis, Missouri, the high temperatures recorded each day were 72° , 67° , 77° , 66° , 78° , 65° , and 65° , respectively. What was the average of the daily high temperatures during that period, to the nearest whole degree?

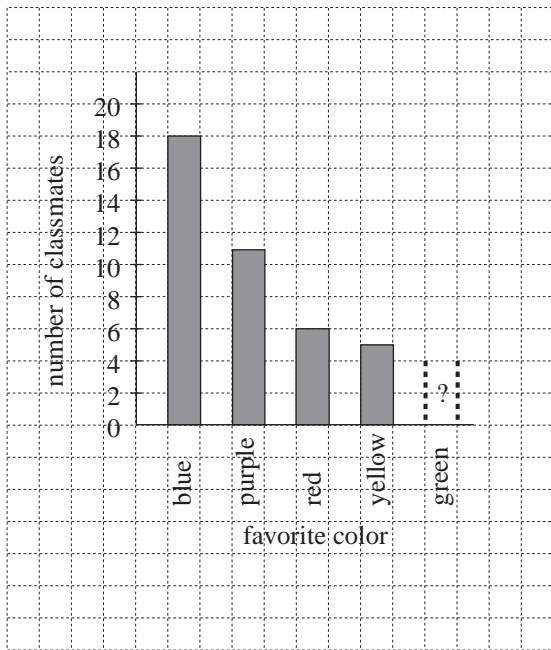
- F. 60°
- G. 67°
- H. 70°
- J. 71°
- K. 75°

2

3. Robin asked 50 classmates to name their favorite color and gathered the following information.

| Favorite color | blue | purple | red | yellow | green |
|----------------------|------|--------|-----|--------|-------|
| Number of classmates | 18 | 11 | 6 | 5 | 10 |

Robin decided to display the information in a bar graph on graph paper as shown below. If the bar labeled *blue* is 9 blocks tall, how many blocks tall should the bar labeled *green* be?



- A. $2\frac{1}{2}$
B. $4\frac{1}{2}$
C. 5
D. $5\frac{1}{2}$
E. 10
4. If $3x + 7 = 28 - 5x$, then $x = ?$

- F. $\frac{21}{8}$
G. $\frac{35}{8}$
H. $\frac{23}{10}$
J. $-\frac{35}{2}$
K. $-\frac{35}{8}$

DO YOUR FIGURING HERE.

2

DO YOUR FIGURING HERE.

5. What is the next term in the following geometric sequence?

$$6, -4, \frac{8}{3}, -\frac{16}{9}, \underline{\quad}$$

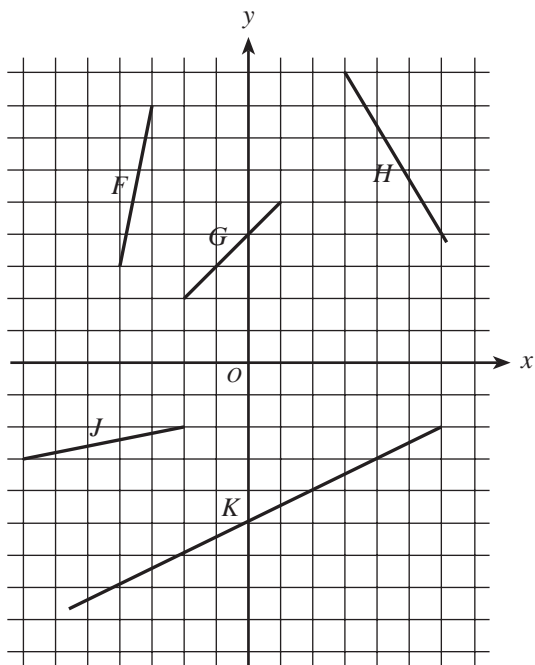
- A. $-\frac{8}{3}$
B. $-\frac{32}{27}$
C. $\frac{32}{27}$
D. $\frac{8}{3}$
E. $\frac{106}{9}$
6. What is the sum of the 2 polynomials in the addition problem below?

$$\begin{array}{r} 2x^2 + 3x + 5 \\ + x^2 + 6x - 1 \\ \hline \end{array}$$

- F. $2x^2 + 9x + 4$
G. $3x^2 + 9x - 5$
H. $3x^2 + 9x + 4$
J. $3x^4 + 9x + 4$
K. $3x^4 + 9x^2 + 4$

DO YOUR FIGURING HERE.

7. Which of the following line segments in the standard (x,y) coordinate plane has the greatest slope?

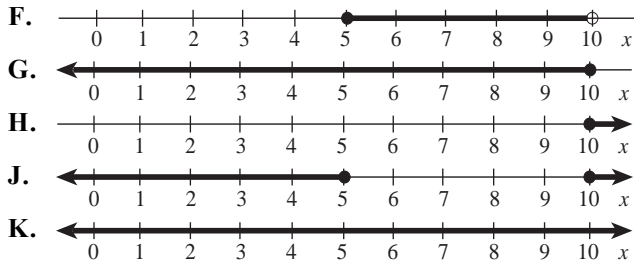


- A. F
 B. G
 C. H
 D. J
 E. K
8. Which of the following lists the fractions $\frac{4}{7}$, $\frac{5}{9}$, and $\frac{2}{3}$ in order from least to greatest?
- F. $\frac{2}{3} < \frac{4}{7} < \frac{5}{9}$
 G. $\frac{4}{7} < \frac{5}{9} < \frac{2}{3}$
 H. $\frac{4}{7} < \frac{2}{3} < \frac{5}{9}$
 J. $\frac{5}{9} < \frac{2}{3} < \frac{4}{7}$
 K. $\frac{5}{9} < \frac{4}{7} < \frac{2}{3}$
9. The coordinates of the endpoints of \overline{RS} on the real number line are 4 and 20. Point M is the midpoint of \overline{RS} . What is the coordinate of M ?
- A. 8
 B. 10
 C. 12
 D. 16
 E. 24

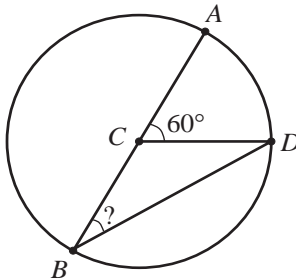
2

DO YOUR FIGURING HERE.

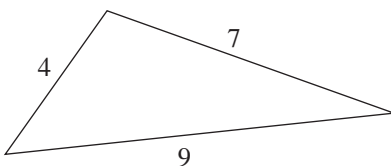
10. Which of the following graphs represents all, and only, the real numbers that satisfy $x - 8 \leq 2$?



11. In the circle centered at C below, \overline{AB} is a diameter, and D lies on the circle. If the measure of $\angle ACD$ is 60° , what is the measure of $\angle ABD$?



- A. 15°
 B. 30°
 C. 40°
 D. 45°
 E. 60°
12. The lengths of the sides in the triangle below are given in centimeters. If you want to construct a similar triangle with a perimeter of 30 centimeters, how many centimeters long should its *longest* side be?

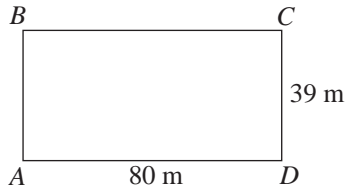


- F. 20.0
 G. 19.0
 H. 16.5
 J. 14.5
 K. 13.5

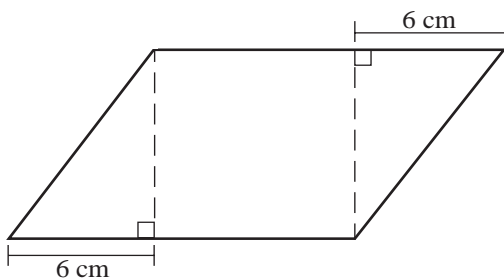
2

DO YOUR FIGURING HERE.

13. The rectangular field shown below is 39 m wide and 80 m long. Frances and Bonita are at point D . Frances walks to point B by walking along the edge of the field through point C . Bonita gets to point B by walking diagonally across the field. About how many meters more does Frances walk than Bonita?



- A. 119
B. 89
C. 41
D. 39
E. 30
14. One of the numbers in the set $\{2, 3, 4\}$ is chosen at random and raised to the power of a different one of these numbers, also chosen at random. What is the probability that the resulting number will be even?
- F. $\frac{1}{6}$
G. $\frac{1}{3}$
H. $\frac{1}{2}$
J. $\frac{5}{9}$
K. $\frac{2}{3}$
15. The figure below shows a parallelogram that is composed of a square and 2 right triangles. The *perimeter* of the square is 32 centimeters, and the lengths of the bases of the triangles are as indicated. What is the *area*, in square centimeters, of the parallelogram?



- A. 112
B. 64
C. 56
D. 48
E. Cannot be determined from the given information

END OF TEST 2

3

READING TEST

DIRECTIONS: There is one passage in this abbreviated version of the test. The passage is followed by several questions. After reading the passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passage as often as necessary.

Passage I

SOCIAL SCIENCE: This passage is adapted from an essay by Ellen Goodman that appeared in *Keeping in Touch* (©1985 by The Washington Post Company).

Twenty years ago, when Valentina Tereshkova went into space, she was followed by an appalling trail of words. The Russians' "smiling cosmonette" and "dimpled space sister" had "her feminine curves hidden in a clumsy space suit." You get the idea.

Sally Ride, in turn, suffered some before she went up in the Challenger. Johnny Carson quipped that the launch was being postponed until Sally could find the purse to match her shoes. A *Time* magazine writer asked if she wept when things went wrong.

By lift-off, however, the media were just about as (1) tamed, (2) repressed, or (3) enlightened as we could have hoped. Indeed, it was Sally Ride's name which seemed to provide more twists, puns, and plays on words for headline writers than her sex. To wit: "Ride, Sally Ride," "Sally Rides High," and "Sally's Joy Ride."

Still, what we are witnessing is a classic case of First Womanitis, a social disease that comes with prolonged exposure to the spotlight. Sally Ride, First American Woman in Space, is taking this trip right into history while her male companions are destined for the trivia shows.

She is also, like it or not, joining a large sorority whose ranks include Elizabeth Blackwell, the first woman to be graduated from an American medical school, in 1849, and Ruth Wilson, the first woman hired as a street cleaner by the Philadelphia Sanitation Department, in 1976.

When all is said and done, Sally Ride is just another First Woman.

Ride is luckier than many of the others in this sorority. People are rooting for her, rather than against her. But the initiation rites are by now familiar.

As a First Woman, she is watched and called upon to explain her very existence in a way that her co-travelers are not. She is asked opinions on everything "female"—from fashion to feminism—and everyone offers opinions about her from her fashions to her feminism.

Nearly all of the select have felt this glare of extraordinariness, even in their more earthly pursuits. Nearly all of them have sighed, at some moment, as Ride did, "It may be too bad that our society isn't further along and that this is such a big deal."

But most First Women share something else: a special conflict. There is the desire to be accepted as a self-made woman, a person who was and is judged on individual merit. There is the realization that each carries a load of other women's frustrations and hopes.

Ride has borne the disappointments of women such as those would-be astronauts of 1961, the dozen whose space futures were canceled out because "the times" were not ripe. She has also taken on the hopes of a generation of young girls in search of heroines. When it all gets to be too much, she flips "the switch marked 'oblivious.'" Maybe First Women wear that switch like a sorority pin.

In any case, Ride is now initiated. She's learned the rules. Being a full-fledged First Woman means carrying your self as a second job. Being a First Woman means taking every step for womankind. It's not easy, but the company is fine.

3

1. It may be reasonably inferred from the passage that Sally Ride received from the media:
 - A. more attention than her male counterparts.
 - B. less attention than her male counterparts.
 - C. the same attention as her male counterparts.
 - D. no attention until twenty years later.

2. The passage states that while Sally Ride is taking a trip into history, her male counterparts are destined for:
 - F. future economic success.
 - G. future space trips.
 - H. news headlines.
 - J. trivia shows.

3. It may be reasonably inferred that the information in the second paragraph (lines 6–10) is included by the author to illustrate how:
 - A. enlightened the media has become.
 - B. powerful the media has become.
 - C. society stereotypes women.
 - D. Sally Ride delayed the shuttle launch.

4. The passage indicates that Ride is luckier than many other First Women because:
 - F. she got to travel in space.
 - G. her future was not canceled out.
 - H. the initiation rites were familiar.
 - J. people were on her side.

5. Throughout the passage, being a First Woman is compared to being:
 - A. in a sorority.
 - B. on a ride into space.
 - C. married to the President.
 - D. in search of heroines.

6. The words used to describe Valentina Tereshkova in the first paragraph are presented by the author as examples of language that:
 - F. describes the skills and abilities of women.
 - G. respects the superiority of female attributes.
 - H. claims equality for women in the workplace.
 - J. devalues the role of an accomplished person.

7. As it is used in line 15, the phrase *to wit* most nearly means:
 - A. stereotypically.
 - B. nevertheless.
 - C. that is.
 - D. therefore.

8. Which of the following statements best summarizes the main point of the passage?
 - F. Society has made marked progress in sex-role stereotyping.
 - G. Male-dominated fields should make an effort to recruit more women.
 - H. Women should attempt to expand professionally into more fields.
 - J. Women who pioneer in male-dominated fields carry an unusual burden.

END OF TEST 3

4

SCIENCE TEST

DIRECTIONS: There are two passages in this abbreviated version of the test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passages as often as necessary.

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

Passage I

The *heating rate* is defined as the amount of heat absorbed by a material in a given time period. When a material absorbs heat, its temperature may rise.

For 50 g each of various liquids, initially at 20°C, Table 1 lists the temperature change when each liquid absorbs heat for 10 sec at a heating rate of 60 watts (W).

| Liquid | Mass (g) | Heating rate (W) | Time (sec) | Temperature change (°C) |
|-----------------|----------|------------------|------------|-------------------------|
| Benzene | 50 | 60 | 10 | 6.9 |
| Ethylene glycol | 50 | 60 | 10 | 5.0 |
| Methanol | 50 | 60 | 10 | 4.7 |
| Mercury | 50 | 60 | 10 | 86.3 |

For 50 g or 100 g of water, initially at 20°C, Figure 1 shows the temperature changes that occur when the water is heated for 10 sec at various heating rates, and Figure 2 shows the temperature changes that result for water at a heating rate of 60 W for various amounts of time.

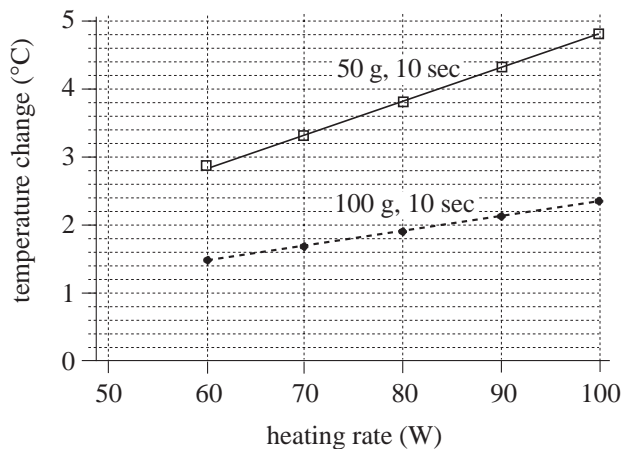


Figure 1

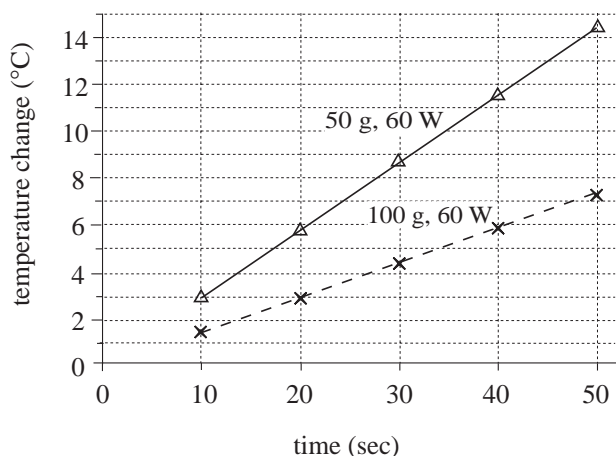


Figure 2

- To produce the data given in Figure 2, different amounts of water were used, most likely to show that the temperature change:
 - for water depended on the rate of evaporation.
 - for water depended on the mass of water used.
 - of 1 g of water depended on water's rate of heat absorption.
 - of 1 g of water depended on time.
- According to Table 1, how much benzene was being heated?
 - 6.9 g
 - 10 g
 - 50 g
 - 60 g

4

3. For both sets of observations graphed in Figure 2, water absorbed heat at a rate of:
- A. 10 W.
 - B. 50 W.
 - C. 60 W.
 - D. 100 W.
4. According to the data in Table 1, which of the following lists ranks the 4 liquids in order of *decreasing* temperature change?
- F. Benzene, ethylene glycol, methanol, mercury
 - G. Ethylene glycol, benzene, mercury, methanol
 - H. Methanol, ethylene glycol, benzene, mercury
 - J. Mercury, benzene, ethylene glycol, methanol
5. According to the data in Figure 1, if 25 g of water were heated at a rate of 60 W for 10 sec, the temperature change of the water would be closest to which of the following values?
- A. 0.7°C
 - B. 1.5°C
 - C. 2.2°C
 - D. 5.7°C
6. Based on the data in Figure 2 for water at a given heating rate, the largest temperature change will be obtained when which of the following amounts of water is heated for how long?
- F. 100 g of water for 100 sec
 - G. 100 g of water for 1,000 sec
 - H. 1,000 g of water for 100 sec
 - J. 1,000 g of water for 1,000 sec

4

Passage II

Herbicides are chemicals that kill plants. A study was conducted to examine the effects of 2 herbicides (Herbicides A and B) on both crop and weed plant species.

Ten identical 10 m × 10 m plots were established in a field. One row of seeds of each of 5 crop species and 5 weed species was planted in each plot. One herbicide at 1 of 2 concentrations was then added to each plot (see Table 1). Plants were observed 2 weeks after application of the herbicides. Plots 1–5 were used in Experiment 1 and Plots 6–10 were used in Experiment 2.

| Plot | Herbicide | Concentration |
|----------|-----------|---------------|
| 1 and 6 | A | low |
| 2 and 7 | A | high |
| 3 and 8 | B | low |
| 4 and 9 | B | high |
| 5 and 10 | None | — |

Experiment 1

Herbicides were applied to the plots immediately after the seeds were planted (*pre-emergence application*). The results are shown in Table 2.

(Note: [X] indicates that the plants died and [-] indicates that plants were not affected.)

| | Plot | | | | |
|--------------|------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Crops | | | | | |
| corn | - | X | - | - | - |
| cucumber | - | X | X | X | - |
| oats | X | X | - | - | - |
| tomato | - | - | X | X | - |
| wheat | X | X | - | - | - |
| Weeds | | | | | |
| crabgrass | X | X | - | - | - |
| quackgrass | X | X | - | - | - |
| foxtail | - | - | - | - | - |
| ragweed | X | X | X | X | - |
| velvetleaf | - | - | X | X | - |

Experiment 2

The herbicides were applied to the plots only after the plants had emerged from the soil and were 6–12 cm tall (*post-emergence application*). Table 3 presents the results.

(Note: [I] indicates that the plants were injured by the herbicide.)

| | Plot | | | | |
|--------------|------|---|---|---|----|
| | 6 | 7 | 8 | 9 | 10 |
| Crops | | | | | |
| corn | - | X | - | - | - |
| cucumber | I | X | - | I | - |
| oats | X | X | - | - | - |
| tomato | I | I | - | I | - |
| wheat | X | X | - | - | - |
| Weeds | | | | | |
| crabgrass | X | X | - | - | - |
| quackgrass | X | X | - | - | - |
| foxtail | - | - | X | X | - |
| ragweed | I | X | I | X | - |
| velvetleaf | I | X | - | - | - |

At the end of the experiments, all plots were seeded with bluegrass in order to prevent soil erosion.

7. Which of the plots served as the control in Experiment 2?
- A. Plot 7
 B. Plot 8
 C. Plot 9
 D. Plot 10
8. In which of the following ways were the procedures of Experiments 1 and 2 different?
- F. Herbicide concentrations
 G. Size of the plots
 H. Plant species tested
 J. Timing of herbicide application

4

9. Based on the results of Experiment 1, one can conclude that Herbicide A has no effect on which of the following crop species after pre-emergence application?
- A. Cucumber
 - B. Oats
 - C. Tomato
 - D. Wheat
10. The study plots used in the experiments were as identical as possible in order to ensure that the:
- F. environmental conditions in each of the plots was about the same.
 - G. herbicides could be applied at the appropriate time during the growing season.
 - H. crop and weed species would respond to the herbicides.
 - J. number of plants which emerged could be counted.

END OF TEST 4

Abbreviated PLAN Test Answer Key

| English Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | H |
| 3 | D |
| 4 | G |
| 5 | D |
| 6 | H |
| 7 | C |
| 8 | H |
| 9 | D |
| 10 | G |
| 11 | C |
| 12 | J |
| 13 | D |

| Mathematics Test | |
|------------------|--------|
| Question | Answer |
| 1 | C |
| 2 | H |
| 3 | C |
| 4 | F |
| 5 | C |
| 6 | H |
| 7 | A |
| 8 | K |
| 9 | C |
| 10 | G |
| 11 | B |
| 12 | K |
| 13 | E |
| 14 | K |
| 15 | A |

| Reading Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | J |
| 3 | C |
| 4 | J |
| 5 | A |
| 6 | J |
| 7 | C |
| 8 | J |

| Science Test | |
|--------------|--------|
| Question | Answer |
| 1 | B |
| 2 | H |
| 3 | C |
| 4 | J |
| 5 | D |
| 6 | G |
| 7 | D |
| 8 | J |
| 9 | C |
| 10 | F |

**Abbreviated
ACT
Test**



ENGLISH TEST

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

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

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

PASSAGE I

A Voice of Her Own

Sandra Cisneros, perhaps the best known Latina

author in the United States, writes poems and stories

¹ whose titles alone—"Barbie-Q," "My Lucy Friend Who

Smells Like Corn," "Woman Hollering Creek"—engage

potential readers' curiosity.

²

Ironically, this renowned writer, whose books are

printed on recycled paper, did not do well in school.

³

When she lectures at schools and public libraries,

Cisneros presents the evidence. An elementary school

report card containing Cs, Ds, and a solitary *B* (for

⁴

conduct). Cisneros has a theory to explain her low grades:

teachers had low expectations for Latina and Latino

students from Chicago's South Side.

1. A. NO CHANGE
B. author and writer
C. author and novelist
D. wordsmith and author

2. F. NO CHANGE
G. potential, reader's
H. potential, readers
J. potential readers

3. A. NO CHANGE
B. writer, who is recognized by her orange and black eyeglasses,
C. writer, who likes to write at night,
D. writer

4. F. NO CHANGE
G. evidence: an
H. evidence; an
J. evidence an



Despite the obstacles that she faced in school, Cisneros completed not only high school but also college. Her persistence paid off in her twenties, when Cisneros was admitted prestigious to the Writers' Workshop at the University of Iowa.

Cisneros soon observed that most of her classmates at the university seemed to have a common set of memories, based on middle-class childhoods, from which to draw in their writing. Cisneros felt decided out of place.

9

She decided to speak from her own experience. Her voice, which by being one of a Latina living outside the mainstream, found a large and attentive audience in

1984 with the publication of her first short story collection, *The House on Mango Street*.

Today, this book is read by middle school, high school, and college students across the United States.

5. The best placement for the underlined portion would be:
- where it is now.
 - before the word *admitted*.
 - before the word *Writers'*.
 - before the word *Workshop*.
6. F. NO CHANGE
G. furthermore
H. nevertheless
J. therefore
7. A. NO CHANGE
B. Cisneros herself,
C. Cisneros, herself
D. Cisneros,
8. F. NO CHANGE
G. deciding
H. decidedly
J. decidedly and
9. Which of the following true statements, if added here, would best serve as a transition between the challenges Cisneros faced as an aspiring writer and her success in meeting those challenges?
- She did not know what to do.
 - Then she had a breakthrough.
 - At that point she almost went home to Chicago.
 - She wondered whether she was in the right field.
10. F. NO CHANGE
G. voice—that of a Latina living outside the mainstream—
H. voice, being one of a Latina living outside the mainstream, it
J. voice—in which it was a Latina living outside the mainstream—
11. A. NO CHANGE
B. 1984. With
C. 1984; with
D. 1984, with,
12. F. NO CHANGE
G. In the future,
H. Meanwhile,
J. At the same time,



Cisneros uses her influence as a successful writer to help other Latina and Latino writers get their works published. But having made the argument that, in order for large numbers of young Latinos to achieve literary success, the educational system itself must change.

Cisneros hints that she succeeded in spite of the educational system. “I’m the exception,” she insists, “not the rule.”

15

13. A. NO CHANGE
 B. she argues that,
 C. arguing that,
 D. she argues that, when
14. Which choice best shows that Cisneros is emphatic about expressing the belief stated in this sentence?
 F. NO CHANGE
 G. says
 H. supposes
 J. asserts
15. The writer is considering deleting the preceding sentence. If the writer decided to delete this sentence, the paragraph would primarily lose a statement that:
 A. enhances the subject and the setting.
 B. provides support for a point previously made.
 C. humorously digresses from the main topic of the paragraph.
 D. contradicts Cisneros’s claim made earlier in the essay.

END OF TEST 1



MATHEMATICS TEST

DIRECTIONS: Solve each problem in this abbreviated version of the test, choose the correct answer, and then circle that answer in the test booklet.

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. Ten boxes of books were delivered to the school library. There were 50 books in each box, except for the last box, which contained only 40 books. How many books did the library receive in this delivery?

- A. 50
- B. 450
- C. 490
- D. 500
- E. 540

2. What is the solution of $x + 3.4 = 20.91$?

- F. 24.31
- G. 23.95
- H. 17.87
- J. 17.51
- K. 6.15

3. Anton went to Mexico during summer vacation with his Spanish class. He recorded the number of pesos he spent each day in a table, as shown below. What was the mean number of pesos he spent per day?

| | | | | | |
|-------------|-----|-----|-----|-----|-----|
| July | 1 | 2 | 3 | 4 | 5 |
| Pesos spent | 250 | 100 | 150 | 100 | 400 |

- A. 100
 - B. 150
 - C. 200
 - D. 220
 - E. 300
4. If $a = 10$, then which of the following represents 8,003 ?
- F. $8a + 3$
 - G. $80a + 3$
 - H. $8a^2 + 3$
 - J. $8a^3 + 3$
 - K. $8a^4 + 3$

DO YOUR FIGURING HERE.



DO YOUR FIGURING HERE.

5. A bag contains 4 red jelly beans, 5 green jelly beans, and 3 white jelly beans. If a jelly bean is selected at random from the bag, what is the probability that the jelly bean selected is green?

- A. $\frac{1}{12}$
 B. $\frac{1}{5}$
 C. $\frac{5}{23}$
 D. $\frac{5}{12}$
 E. $\frac{5}{7}$

6. An earring manufacturing company has fixed costs of \$10,000 per month and production costs of \$0.60 for each pair of earrings it makes. If the company produces x pairs of earrings in a month, which of the following expressions represents the total of the company's monthly costs?

- F. $10,000x$
 G. $10,000 + x$
 H. $10,000x + 0.60$
 J. $10,000 + 0.60x$
 K. $(10,000 + 0.60)x$

7. For what value of a is $x = 3$ a solution to the equation $x + 3 = ax + 9$?

- A. 1.5
 B. 1
 C. -1
 D. -1.5
 E. -3

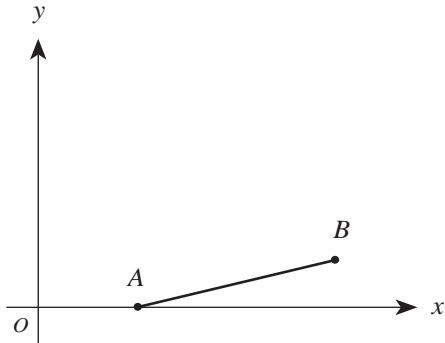
8. Quadrilateral $ABCD$ has vertices $(-2,-1)$, $(4,-3)$, $(5,2)$, and $(-1,3)$ in the standard (x,y) coordinate plane. Suppose $ABCD$ is translated 2 units to the left and 1 unit down, forming quadrilateral $A'B'C'D'$. Which of the following shows the coordinates of the vertices of $A'B'C'D'$?

- F. $(-4,-2)$, $(2,-4)$, $(3,1)$, $(-3,2)$
 G. $(-3,-3)$, $(3,-5)$, $(4,0)$, $(-2,1)$
 H. $(-2,-2)$, $(4,-4)$, $(5,1)$, $(-1,2)$
 J. $(0,0)$, $(6,-2)$, $(7,3)$, $(1,4)$
 K. $(4,2)$, $(-8,6)$, $(-10,-4)$, $(2,-6)$



9. The scales on both axes of the standard (x,y) coordinate plane below are the same. Of the following, which is the best estimate for the slope of \overline{AB} ?

DO YOUR FIGURING HERE.

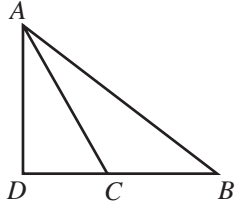


- A. 4
 B. $\frac{3}{4}$
 C. $\frac{1}{4}$
 D. $-\frac{1}{4}$
 E. -4
10. A truck sprang a leak at the bottom of its radiator, which held 480 ounces of fluid when it started to leak, and started losing radiator fluid at a constant rate of 4 ounces per minute. Suppose that the radiator continued to leak at this constant rate and that the truck, traveling at 35 miles per hour, could continue traveling at this rate until its radiator was completely empty. In how many *miles* would the radiator be empty?
- F. 13.7
 G. 17.5
 H. 35.0
 J. 70.0
 K. 120.0
11. For $y \neq 0$, $\frac{y^8}{y^2}$ is equivalent to:

- A. 1
 B. 4
 C. y^3
 D. y^4
 E. y^6



12. In $\triangle ABD$ below, points D , C , and B are collinear, \overline{AD} is perpendicular to \overline{DB} , and \overline{AC} bisects $\angle DAB$. If the measure of $\angle CBA$ is 40° , what is the measure of $\angle ACB$?

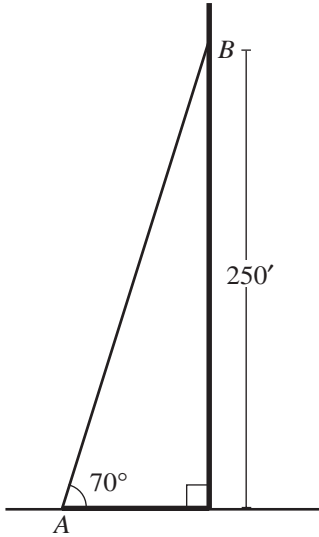


- F. 115°
 G. 112.5°
 H. 110°
 J. 107.5°
 K. 105°
13. You have enough material to build a fence 40 meters long. If you use it all to enclose a square region, how many square meters will you enclose?
- A. 160
 B. 100
 C. 80
 D. 40
 E. 20
14. One neon sign flashes every 6 seconds. Another neon sign flashes every 8 seconds. If they flash together and you begin counting seconds, how many seconds after they flash together will they next flash together?
- F. 48
 G. 24
 H. 14
 J. 7
 K. 2

DO YOUR FIGURING HERE.



15. The radio station WEST is erecting a new transmitting tower that is 280 feet tall. A support wire will be attached to the ground at point A and to the tower 250 feet up at point B , as shown below. The wire must be at least as long as \overline{AB} . Which of the following expresses the length of \overline{AB} , in feet?



- A. $250 \cos 70^\circ$
B. $250 \sin 70^\circ$
C. $250 \tan 70^\circ$
D. $\frac{250}{\cos 70^\circ}$
E. $\frac{250}{\sin 70^\circ}$

DO YOUR FIGURING HERE.

END OF TEST 2

READING TEST

DIRECTIONS: There is one passage in this abbreviated version of the test. The passage is followed by several questions. After reading the passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passage as often as necessary.

Passage I

SOCIAL SCIENCE: This passage, which describes land practices in the commons (tracts of land that belonged to and were used by a community as a whole), and the enclosure movement (when the commons were taken over by private interests and fenced off), is adapted from the essay “The Place, the Region, and the Commons” by Gary Snyder, which is included in his book *The Practice of the Wild* (©1990 by Gary Snyder).

I stood with my climbing partner on the summit of Glacier Peak looking all ways round, ridge after ridge and peak after peak, as far as we could see. He said: “You mean there’s a senator for all this?” It is easy to think there are vast spaces on earth yet unadministered, perhaps forgotten, or unknown, but it is all mapped and placed in some domain. In North America there is a lot that is in the public domain, which has its problems, but at least they are problems we are all enfranchised to work on.

American public lands are the twentieth-century incarnation of a much older institution known across Eurasia—in English called the “commons”—which was the ancient mode of both protecting and managing the wilds of the self-governing regions. It worked well enough until the age of market economies, colonialism, and imperialism. Let me give you a kind of model of how the commons worked.

Between the extremes of deep wilderness and the private plots of the farmstead lies a territory which is not suitable for crops. In earlier times it was used jointly by the members of a given tribe or village. This area, embracing both the wild and the semi-wild, is of critical importance. It is necessary for the health of the wilderness because it adds big habitat, overflow territory, and room for wildlife to fly and run. It is essential even to an agricultural village economy because its natural diversity provides the many necessities and amenities that the privately held plots cannot. It enriches the agrarian diet with game and fish. The shared land supplies firewood, poles and stone for building, clay for the kiln, herbs, dye plants, and much else. It is especially important as seasonal or full-time open range for cattle, horses, goats, pigs, and sheep.

In the abstract the sharing of a natural area might be thought of as a matter of access to “common pool resources” with no limits or controls on individual exploitation. The fact is that such sharing developed over

millennia and always within territorial and social contexts. In the peasant societies of both Asia and Europe there were customary forms that gave direction to the joint use of land. They did not grant free access to outsiders, and there were controls over entry and use by member households. The commons is both specific land and the traditional community institution that determines the carrying capacity for its various subunits and defines the rights and obligations of those who use it, with penalties for lapses. Because it is traditional and *local*, it is not identical with today’s “public domain,” which is land held and managed by a central government. Under a national state such management may be destructive (as it is becoming in Canada and the United States) or benign, but in no case is it locally managed. One of the ideas in the current debate on how to reform our public lands is that of returning them to regional control.

An example of traditional management: what would keep one household from bringing in more and more stock and tempting everyone toward overgrazing? In earlier England and in some contemporary Swiss villages, the commoner could only turn out to common range as many head of cattle as he could feed over the winter in his own corrals. This meant that no one was allowed to increase his herd from outside with a cattle drive just for summer grazing.

There is a well-documented history of the commons in relation to the village economies of Europe and England. In England from the time of the Norman Conquest the knights and overlords began to gain control over the many local commons. From the fifteenth century on the landlord class increasingly fenced off village-held land and turned it over to private interests. The enclosure movement was backed by the big wool corporations who found profit from sheep to be much greater than that from farming. The wool business had a destructive effect on the soils and dislodged peasants. The arguments for enclosure in England—efficiency, higher production—ignored social and ecological effects and served to cripple the sustainable agriculture of some districts.

The enclosures created a population of rural homeless who were forced in their desperation to become the world’s first industrial working class. The enclosures were tragic both for the human community and for natural ecosystems. The fact that England now has the least forest and wildlife of all the nations of Europe has much to do with the enclosures.

1. As it is used in line 12, the word *incarnation* most nearly means:
 - A. import.
 - B. version.
 - C. area.
 - D. relationship.
2. The author's primary aim in this passage is to:
 - F. criticize Canadian and United States management of public domain lands.
 - G. describe traditional commons and explain the effects of their disappearance.
 - H. praise the commons movement and explain how the enclosure movement benefitted from it.
 - J. persuade members of central governments to tighten their control over commonly held land.
3. During the period of enclosure in England, production and efficiency were increased at the expense of the:
 - A. landlord class, which had to fence commons land.
 - B. local communities and their environment.
 - C. profits made by big wool corporations.
 - D. knights and overlords who owned the land.
4. According to the passage, what would keep a commoner from overgrazing the commons?
 - F. A reminder that this could be harmful to the community
 - G. A realization that profits would eventually diminish
 - H. A belief that no one in the community would do this
 - J. A rule listing the limits to the commoner's herd size
5. The passage implies that the number of commons in Europe diminished primarily because of:
 - A. dissatisfaction on the part of villagers.
 - B. displacement of the population of rural homeless.
 - C. increased production by farmers, villagers, and tribal members.
 - D. greed on the part of landowners and corporations.
6. As it is used in line 5, the word *unadministered* most nearly means *not*:
 - F. farmed.
 - G. crossed.
 - H. given to people.
 - J. governed.
7. According to the passage, what happened to change the traditional commons?
 - A. Landowners fenced off portions of it which were then used for private purposes.
 - B. The rural homeless population left the land and moved to the cities to take jobs in industry.
 - C. Knights and overlords began to dictate that the commons would be used for farming.
 - D. Peasants fenced the lands because they had been dislodged by big wool corporations.
8. Which of the following statements best summarizes the author's view of commons?
 - F. The commons provided an ideal place where new settlers could build farms, raise their families, and run livestock.
 - G. The commons worked well as an abstract idea, but in fact its maintenance was a burden on village economies.
 - H. The commons provided an area where wild plants and animals could thrive, which benefitted villagers.
 - J. The commons tempted villagers to overgraze, and eventually such overgrazing led to the enclosure movement.
9. The main difference between today's land in the public domain and the traditional commons described in the passage is that:
 - A. land in the public domain is locally controlled, while the commons were controlled by a central government.
 - B. land in the public domain includes both wild and semi-wild areas, while the commons included only land suitable for farming.
 - C. the commons were under the control of a local government, while land in the public domain is controlled by a central government.
 - D. the commons were available for use without limits or controls, while land in the public domain is carefully managed to avoid overuse.
10. According to the passage, the commons provided necessities for villagers that local farms could not provide, such as:
 - F. cattle, horses, goats, pigs, and sheep.
 - G. fish, game, poultry, and grain.
 - H. bricks, clay pots, spices, and fabrics.
 - J. building materials, fish, game, and herbs.

END OF TEST 3



SCIENCE TEST

DIRECTIONS: There are two passages in this abbreviated version of the test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passages as often as necessary.

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

Passage I

Herbicides are used to control the growth of weeds. An herbicide that may be used safely with one crop species may damage another crop if the latter crop is planted in soil containing residual amounts of the herbicide from an earlier application. Two experiments were performed to study this effect.

Experiment 1

A botanist filled 90 pots with Soil Type 1. No herbicide was added to the soil in 10 pots. The other pots were divided into groups of 10 and the soil in each group was treated with 10, 20, 50, or 100 ppm of either Herbicide A or B. All other factors were held constant. Ten seeds of a corn hybrid were planted in each pot. After 40 days, the plants were uprooted, oven-dried, and weighed. The results are shown in Table 1.

| Herbicide dose (ppm) | Average mass of plants (g) | |
|----------------------|----------------------------|-------------|
| | Herbicide A | Herbicide B |
| 10 | 14.1 | 15.6 |
| 20 | 12.4 | 13.7 |
| 50 | 9.3 | 12.1 |
| 100 | 5.5 | 9.3 |

Note: Average plant mass in untreated soil was 16.0 g.

Experiment 2

Experiment 1 was repeated with 90 pots of Soil Type 1 and 90 pots of Soil Type 2. The same herbicide doses and corn hybrid were used. All other factors were held constant. After 40 days, the heights of the plants were measured. The results are shown in Table 2.

| Herbicide dose (ppm) | Average height of plants (cm) | | | |
|----------------------|-------------------------------|-------------|-------------|-------------|
| | Soil Type 1 | | Soil Type 2 | |
| | Herbicide A | Herbicide B | Herbicide A | Herbicide B |
| 10 | 46.3 | 49.0 | 50.3 | 52.5 |
| 20 | 42.0 | 47.0 | 44.4 | 47.0 |
| 50 | 34.1 | 39.4 | 40.6 | 42.3 |
| 100 | 19.6 | 22.7 | 30.9 | 36.4 |

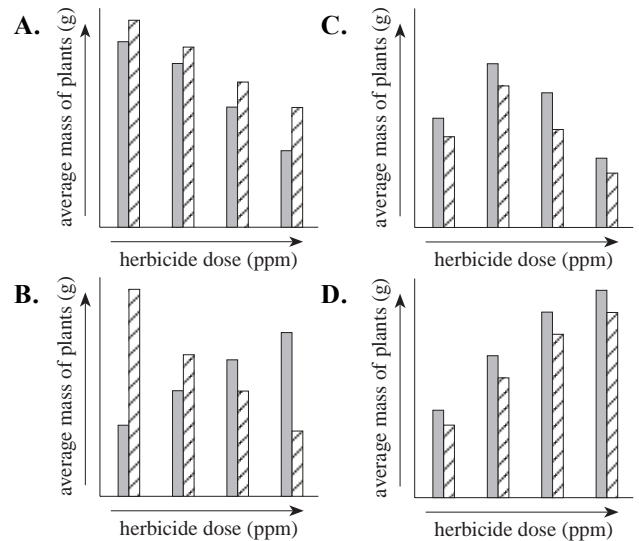
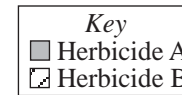
Note: Average plant height in untreated Soil Type 1 was 50.6 cm; average plant height in untreated Soil Type 2 was 52.7 cm.

Information on the two soil types used is given in Table 3.

| Soil Type | pH | Organic matter (%) | Clay (%) |
|-----------|-----|--------------------|----------|
| 1 | 6.9 | 5.0 | 16.3 |
| 2 | 6.2 | 9.5 | 7.9 |



1. The results of Experiment 2 indicate that, at every herbicide dose, average plant height was *lowest* under which of the following conditions?
- Herbicide A and Soil Type 1
 - Herbicide B and Soil Type 1
 - Herbicide A and Soil Type 2
 - Herbicide B and Soil Type 2
2. Which of the following sets of plants served as the control in Experiment 1?
- Plants grown in untreated soil
 - Plants grown in soil treated with 10 ppm of Herbicide A
 - Plants grown in soil treated with 10 ppm of Herbicide B
 - Plants grown in soil treated with 100 ppm of Herbicide A
3. Which of the following best explains why the herbicides were applied to the soil instead of directly onto the corn plants?
- Corn plants are not affected when herbicides are applied directly on them.
 - Corn plants usually die immediately upon application of herbicides.
 - The experiments were testing how herbicides present in the soil affect corn growth.
 - The experiments were testing how soil pH affects corn growth.
4. Assume that a second corn hybrid was grown in soil treated with varying doses of a third herbicide (Herbicide C). Based on the results of the experiments, what prediction, if any, about the effect of Herbicide C on the growth of this second corn hybrid can be made?
- Herbicide C would have no effect on the growth of these plants.
 - Herbicide C would interfere with plant growth, but only at doses above 50 ppm.
 - Herbicide C would interfere with plant growth at low doses, but have no effect at high doses.
 - No prediction can be made on the basis of the results.
5. Another set of corn seeds was planted in Soil Type 1 under the same conditions as Experiment 1, except that the soil was treated with 150 ppm of Herbicide A. Based on the results of Experiment 1, one would predict that the approximate average mass of a corn plant after 40 days would be:
- less than 5.5 g.
 - between 6.0 g and 9.3 g.
 - between 9.4 g and 14.1 g.
 - greater than 14.1 g.
6. Which of the following best describes the hypothesis tested in Experiment 2?
- Growing time affects plant height.
 - Soil type influences herbicide effects.
 - The amount of soil moisture affects herbicide toxicity.
 - A combination of herbicides has a greater effect on plant growth than do individual herbicides.
7. Which of the following graphs best illustrates the relationship of average plant mass and herbicide dose in Experiment 1?



8. According to Table 3, Soil Type 2 differs from Soil Type 1 in which of the following ways?
- Soil Type 2 is less acidic than is Soil Type 1.
 - Soil Type 2 has a higher percent organic matter than does Soil Type 1.
 - Soil Type 2 has a higher percent clay content than does Soil Type 1.
 - Soil Type 2 contains higher levels of Herbicides A and B than does Soil Type 1.

**Passage II**

Crustal *plates* (sections of Earth's crust) lie on top of a denser layer of material known as the *mantle*, which extends to a depth of 2,900 km, where the core begins. Mantle material moves by a process known as *convection*. In convection, molten or semisolid material is heated from below, rises as large *plumes*, spreads horizontally, cools, and then sinks, creating a *convection cell*. Plates are carried along by the convection cells and plate edges may be forced down into the mantle creating large, cold, *sinking slabs* of crust. Below are two opposing views about the nature of mantle convection.

Viewpoint 1

The mantle is composed of 2 layers that are chemically distinct and do not mix. The lower mantle is denser, hotter, enriched in iron and silicon, and under greater pressure than the upper mantle. Convection cells exist only in the 600 km deep upper mantle. Only heat passes between the 2 layers; no actual material is exchanged. The boundary between the mantle layers can be detected with *seismic* (earthquake) waves which speed up significantly at and below a depth of 600 km.

The sinking slabs are dense and cold enough to sink into the upper mantle but not into the lower mantle. Earthquakes have been detected in the sinking slabs, but none below a depth of 600 km. Scientists who believe that slabs penetrate deeper are misinterpreting their seismic data.

Viewpoint 2

The whole mantle circulates in convection cells and mixing occurs throughout. The 600 km deep "boundary" is merely a place where pressure transforms the crystal structure of the mantle material. Different crystal structures do not preclude mixing of the entire mantle. Seismic studies have detected sinking slabs of colder rock that had penetrated the mantle to depths between 600 and 1,400 km in many parts of the world.

Mathematical models have shown that the *tilt angle* (angle at which sinking slabs descend into the mantle) of known sinking slabs corresponds much more closely to that expected for whole mantle convection than to tilt angles expected for only upper mantle convection.

9. According to Viewpoint 1, an ascending plume of hot mantle material that originates near a depth of 2,900 km would be able to rise:
- all the way to the bottom of the crust.
 - all the way to the surface of Earth.
 - only to the bottom of the upper mantle.
 - only a few km above that depth.
10. Which of the following statements best describes how the 2 viewpoints are alike?
- Both are based on the nature of rock samples from the deep seafloor.
 - Both agree that material from the lower mantle mixes with the upper mantle.
 - Both agree that the mantle has the same properties throughout its depth.
 - Both depend to some extent on studies using seismic waves.
11. Which of the following hypotheses provides the best compromise between the 2 viewpoints on the current structure of the mantle?
- Convection took place only in the upper mantle when Earth was new, but billions of years later, the entire mantle was involved.
 - Convection took place throughout the entire mantle when Earth was new, but today, convection is limited to the upper mantle.
 - Mantle convection has ceased and the mantle is now a layer of uniform temperature and density.
 - Only the hottest part of the material ascending from the lower mantle rises past the 600 km boundary, so only part of the lower mantle mixes with the upper mantle.

END OF TEST 4

Abbreviated ACT Test Answer Key

| English Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | F |
| 3 | D |
| 4 | G |
| 5 | C |
| 6 | F |
| 7 | A |
| 8 | H |
| 9 | B |
| 10 | G |
| 11 | A |
| 12 | F |
| 13 | B |
| 14 | J |
| 15 | B |

| Mathematics Test | |
|------------------|--------|
| Question | Answer |
| 1 | C |
| 2 | J |
| 3 | C |
| 4 | J |
| 5 | D |
| 6 | J |
| 7 | C |
| 8 | F |
| 9 | C |
| 10 | J |
| 11 | E |
| 12 | F |
| 13 | B |
| 14 | G |
| 15 | E |

| Reading Test | |
|--------------|--------|
| Question | Answer |
| 1 | B |
| 2 | G |
| 3 | B |
| 4 | J |
| 5 | D |
| 6 | J |
| 7 | A |
| 8 | H |
| 9 | C |
| 10 | J |

| Science Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | F |
| 3 | C |
| 4 | J |
| 5 | A |
| 6 | G |
| 7 | A |
| 8 | G |
| 9 | C |
| 10 | J |
| 11 | D |