

REVOLUTION



Instructions

Fill out the answer sheets completely:

- 1 - Last Name — Write and bubble in your last name.
- 2 - Print your first and last name.
- 3 - Student ID — This is the six-digit Revolution ID you were assigned.
- 4 - Birthday — Write and bubble in your birthday.
- 5 - Test Form Code — **Fill in the “1” and “A” bubbles.**
- 6 - Print your first and last name in the box at the top of **page 3 and page 4.**
- 7 - *Bubble in darkly and completely or your exam will not be graded properly.*

Format

The ACT is made up of 5 “tests”: English, Math, Reading, Science, and Writing.

Test 1 is the English Test; it has a 45-minute time limit.

Test 2 is the Math Test; it has a 60-minute time limit.

Test 3 is the Reading Test; it has a 35-minute time limit.

Test 4 is the Science Test; it has a 35-minute time limit.

Test 5 is the Writing Test; it has a 40-minute time limit.

During a given test’s time limit, you may work **ONLY** on that test. You may not go back to earlier tests or skip ahead to later tests.

Breaks

You will be given a 10-minute break after Test 2 and a 5-minute break after Test 4.

Answer Sheets

When you complete your test, place the pages in order (pages 1 and 3 facing up), and hand your answer sheets to your proctor. If you take the test at home, mail in the answer sheets to:

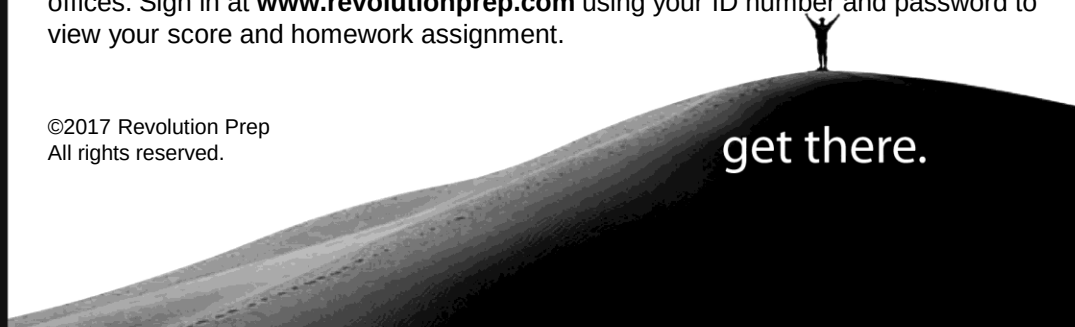
Revolution Prep
710 Wilshire Blvd, Suite 501
Santa Monica, CA 90401

Test Booklet

DO NOT turn in your test booklet. After you complete the test, put the booklet into your Revolution Prep binder. Your instructor will review questions from the test in class.

Scores

Your score will be posted after your answer sheets arrive at the Revolution Prep offices. Sign in at **www.revolutionprep.com** using your ID number and password to view your score and homework assignment.



ENGLISH TEST

45 Minutes—75 Questions

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

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

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

PASSAGE I

Me and My Phobia

My therapist tells me that fear is a normal. Legitimate¹ response to genuine danger. Easy for her to say. I’ve never known anyone to be attacked by a pantry, but I still feel a thrill of panic whenever having to reach for that last,² forgotten jar of mayonnaise.

Back into the attic, putting boxes is absolutely impossible.³ My therapist, a good woman, tells me that when fear spirals out of control, becoming persistent and irrational, it’s considered a phobia. She says phobias affect a⁴ significant portion of the American population. I guess she feels I’d enjoy the company. Some experts believe that nearly twenty-five percent of Americans live with irrational and frightening fears that prevent them from⁵ performing everyday activities. What she didn’t need to tell me is that phobias like other, anxiety disorders, can⁶ greatly affect a person’s quality of life.

1. A. NO CHANGE
B. normal, legitimate
C. normal; legitimate
D. normally, legitimate
2. F. NO CHANGE
G. whenever I am having to reach
H. whenever I, reaching
J. whenever I reach
3. A. NO CHANGE
B. Boxes, putting them back into the attic
C. Putting boxes back into the attic
D. Putting back into the attic the boxes
4. F. NO CHANGE
G. its
H. its’
J. they’re
5. A. NO CHANGE
B. and scary
C. and illogical
D. OMIT the underlined portion.
6. F. NO CHANGE
G. phobias, like other anxiety disorders,
H. phobias, like other anxiety, disorders
J. phobias, like, other, anxiety disorders,

I've read that phobias are normally developed from a past negative experience. In my case, my mother tells me that a cousin locked me in a closet once when we were playing hide-and-seek. I was too young to remember so⁷ clearly, but I remember my fear. Some studies suggest genetic factors may play a role. This also makes sense because my grandmother had a terrible fear of heights – to the point of insisting on living only in single-story homes⁸. It frustrated my grandfather, but I understood. After all, you can fall down stairs!

The books say phobias come in three distinct classes: being agoraphobia⁹, social phobia, and specific phobia. Agoraphobics have an intense fear of being trapped in a situation from which they cannot immediately escape. Agoraphobia is the most¹⁰ disabling type of phobia and treatment is complicated. Social phobias are fears related to people or social situations. Social phobias can greatly interfere with work responsibilities and personal relationships. Specific phobia is a general category for any phobia other than agoraphobia and social phobia. 11

My grandmother and I had different categories of specific

phobia. Luckily for us, this class containing¹² the most recognizable set of symptoms and is often the easiest to treat.

There are four categories of specific phobias that are¹³ covering¹³ over 350 distinct fears, including arachnophobia

7. A. NO CHANGE
B. them
C. the episode
D. it being
8. Which of the alternatives best provides specific evidence of the grandmother's fear of heights?
F. NO CHANGE
G. she had a phobia.
H. her fear was irrational.
J. heights really frightened her.
9. A. NO CHANGE
B. classes: agoraphobia
C. classes: being, agoraphobia
D. classes. Agoraphobia
10. F. NO CHANGE
G. more
H. greatest
J. less
11. The writer is considering deleting the following from the preceding sentence:
for any phobia other than agoraphobia and social phobia
If the writer were to delete this phrase, the essay would primarily lose:
A. an unimportant detail regarding the writer's phobias.
B. a necessary detail regarding specific phobia.
C. the writer's opinion about the seriousness of specific phobia.
D. an indication of how specific phobia affected the writer.
12. F. NO CHANGE
G. has contained
H. contained
J. contains
13. A. NO CHANGE
B. phobias to be covering
C. phobias covering
D. phobias, and that cover

(fear of spiders), acrophobia (fear of heights),
trypanophobia (fear of needles), and – my favorite –
claustrophobia (fear of enclosed spaces). In many cases,
persons facing a phobia will show visible signs of
panic. 14 Often, people begin to fear the very possibility
of a phobic attack. It has happened to me at work. Once, a
co-worker found me trembling outside the supply closet,
trying to get up the courage to pick up a new ink
cartridge; I was immobilized by fear.

15

14. Given that all are true, which of the following additions to the preceding sentence (replacing the period) would be most relevant?
- F. and act frightened.
G. like a rapid heartbeat and shortness of breath.
H. but won't acknowledge them.
J. whenever they confront enclosed spaces.
15. The writer wants to link the essay's opening and concluding sentences. Which of the alternatives most successfully achieves this effect?
- A. NO CHANGE
B. that was a frightening experience.
C. I was quite embarrassed.
D. that experience is what led me to my therapist.

PASSAGE II

Fraud and Contract Law: A Brief History

Not everyone knows that much of American law. Is
closely based on medieval English law. In fact, one of the
rules enacted by the English court system in the 17th
century is still relevant in the United States in the 21st
century. This rule, called the Statute of Frauds, require that
certain contracts be in writing in order to be enforceable.
The value of written contracts seems obvious today, but
the rule has its origins, you see, in pre-literate England.

16

During that time, the source of almost all of society's
wealth was agricultural production. In other words,
farming was far more important than manufacturing or
trade, and land was one of the most valuable things a
person, usually male, could own. When one freeholder (an
individual who owned a piece of real estate)
wished and desired to sell his land to another freeholder,

17

16. F. NO CHANGE
G. law; is
H. law is
J. law it is
17. A. NO CHANGE
B. requires
C. which requires
D. it requires
18. F. NO CHANGE
G. origins
H. origins, as proof
J. origins, rightfully so,
19. Which of the following alternatives to the underlined portion would NOT be acceptable?
- A. Consequently
B. That is to say
C. Therefore
D. Despite this
20. F. NO CHANGE
G. had the hope and desire
H. wished
J. was hopeful and desiring

there was a good chance that both of them would be unable to read or write. So, the two men would gather some nearby residents that could witness²¹ a ceremony called a *Livery of Seisin* (from Latin for “delivery of possession”). During the ceremony, the seller would pick up a stone or twig and hand it to the buyer in exchange with²² the purchase price in gold or some other acceptable item. From that time forward, the locals would know that the buyer owned the land outright and that the seller had no further²³ claim to it. If a dispute over ownership of the parcel later arose, the witnesses could be called forward to testify that they could of seen²⁴ the transfer of ownership take place.

Soon after the *Livery of Seisin* became relatively widespread, some of the more vigorous²⁵ freeholders realized that this ceremony gave them an unethical

opportunity to expand by increasing²⁶ their holdings. These freeholders would show up at the funerals of recently deceased freeholders with a few of the most imposing, well-armed “witnesses” they could recruit (often for a fee). The “witnesses” would tell all those gathered that the departed had sold his land to their employer and that they had witnessed the *Livery of Seisin*. Few, if any²⁷ legitimate heirs would be in a position to protest.

For instance²⁸, the late 17th century, some of the freeholders who had expanded their land holdings in this way were able to raise private armies and, in some cases, threaten the government. The Statute of Frauds was enacted

21. A. NO CHANGE
B. that being witness to
C. who witness
D. to witness

22. F. NO CHANGE
G. for
H. of
J. to

23. A. NO CHANGE
B. farther
C. farthest
D. furthest

24. F. NO CHANGE
G. seen
H. had seen
J. could of saw

25. A. NO CHANGE
B. ingenious
C. mercurial
D. liberated

26. F. NO CHANGE
G. expand and increase
H. really expand on
J. expand

27. A. NO CHANGE
B. Few if any
C. Few, if any
D. Few,

28. F. NO CHANGE
G. By
H. Eventually,
J. So far in the

1

in 1679 and required that all contracts for the purchase and sale of any land had to be in writing and signed “by the party to be charged” in order to be enforceable. With some modifications by someone making changes, the same rule is

29

in place in all jurisdictions being in the United States today.

30

29. A. NO CHANGE
B. changes made by modifying,
C. modifications,
D. OMIT the underlined portion.
30. F. NO CHANGE
G. inside the borders of
H. that are on the inside of
J. within

PASSAGE III

Managing Wildfires in the West

There is an ongoing disagreement between those who want to actively manage the environment and those who believe in humans should take a “hands off” approach. For

31

example, some people advocate active management of

forests that include removing trees and brush to prevent wildfires. Others argue that humans should not interfere

32

with the natural stable balance of the forests. They say that

33

fire is a part of maintaining the proper balance of

underbrush and new-growth trees. Moreover, they argue

that smaller, “natural” fires may prevent uncontrolled,

larger blazes. To some, this is just a rhetorical debate. But

to those of us who live with wildfires, the choice can come

down to life or death.

34

Wildfires can be devastating, especially when dry

weather conditions turn vegetation into kindling. Here in

California: fall means blistering hot Santa Ana winds that

35

blow in from across the desert. Usually, the winds just

wreak havoc on my allergies.

31. A. NO CHANGE
B. in the
C. that
D. that the
32. F. NO CHANGE
G. includes
H. will include
J. including
33. A. NO CHANGE
B. steady
C. equal
D. OMIT the underlined portion.
34. F. NO CHANGE
G. us living or dying.
H. whether we live or die.
J. us being alive afterwards, or not.
35. A. NO CHANGE
B. California. Fall
C. California, fall
D. California fall,

But every few years, it seems the countryside splinters into flames.

Wildlife and livestock are killed, plants are consumed, and
hundreds of homes are burned to the ground. Fall means
 calling friends to see if they need a place to stay or
 packing up my own things to seek shelter somewhere else.
 The danger isn't over once the fires are put out, either.

Winter in California means our annual allotment of rain.

Landslides can follow heavy rains when

hillsides, which were stripped by fire of trees and shrubs.

These landslides can pollute water sources and result in the
 loss of the topsoil necessary to support new growth.

Instead, stripped hillsides are extremely unstable. This can
 also pose a threat to homes in the area.

Of course, there is no way to stop wildfires altogether.

And no one by advocating that we try. The real question is
 how to manage them. Once a wildfire is burning,

firefighters often use a technique called "controlled

burning" to contain the fire and force it to burn itself out.

Unfortunately, controlled burning cannot be done on land

of dense underbrush and an overabundance of new-growth
 trees. In order to successfully manage a controlled burn,

such vegetation must be thinned out. Forestry workers

must "knock down the fuel load" before fire is introduced.

They do this by cutting and removing brush and small

trees; otherwise, a fire might burn uncontrollably.

[1] While "knocking down" in native forests is still
 under debate, everyone agrees its important for residences

36. F. NO CHANGE
 G. erupts
 H. fractures
 J. composes

37. At this point, the writer would like to provide specific details about the devastation of wildfires. Which alternative does that best?
 A. NO CHANGE
 B. The wildfires kill many plants and animals and also destroy homes.
 C. Wildfires can be very devastating.
 D. Raging fires burn out of control.

38. F. NO CHANGE
 G. hillsides, being
 H. hillsides have been
 J. hillsides were

39. A. NO CHANGE
 B. Despite this
 C. Nevertheless
 D. Moreover

40. F. NO CHANGE
 G. is advocating
 H. who advocates
 J. would have advocated

41. A. NO CHANGE
 B. where
 C. with
 D. that's

42. F. NO CHANGE
 G. it's
 H. they're
 J. its'

1 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ 1

that border open land. [2] In my neighborhood, homeowners are required to keep their property cleared of⁴³ anything that might serve as kindling during fire season. [3] Even more, we are told to make our houses as fireproof as possible. [4] This can be accomplished by using special building materials. [5] As some people have learned the hard way, it takes just one spark to burn a house to the ground. 44

43. A. NO CHANGE
B. cleared by
C. clearing off
D. clear with
44. For the sake of logic and coherence, Sentence 4 should be placed:
F. where it is now.
G. before Sentence 1.
H. before Sentence 2.
J. before Sentence 3.

Question 45 asks about the preceding passage as a whole.

45. Suppose the writer’s goal had been to write a brief essay detailing her personal experiences with wildfires. Would this essay successfully fulfill that goal?
- A. Yes, because the essay mentions that the writer lives in California.
B. Yes, because the essay details the writer’s devastation at losing her home to a wildfire.
C. No, because the essay is not written from any one person’s perspective.
D. No, because the essay primarily focuses on the management of California wildfires.

PASSAGE IV

Marcus Garvey: Black-Nationalist Leader

[1]

Marcus Garvey was a famous Black-Nationalist leader, poet, writer, businessman, political candidate, and philosopher by making⁴⁶ his most significant social and political contributions in the early 20th century. His fiery⁴⁷ speeches and strong opinions made him many enemies, but his beliefs and achievements, mostly born out of his passionate condemnation of racial discrimination, continue

46. F. NO CHANGE
G. and making
H. that made
J. who made
47. Which of the choices would be most appropriate here?
A. NO CHANGE
B. hot
C. glowing
D. sweltering

to influence modern discourse. Garvey's politics were radical and had an effect that was international, and to fully understand where his agenda stemmed from, it is important to place him in his historical context.

[2]

Garvey was born in Jamaica in 1887 and went to be in college in London just before World War I. During the war, he moved to the United States to begin working on his dream of political unity for all people with African ancestry. Many African Americans were ready to help, especially after their experiences following the war. African American soldiers had fought in the war and died for their country. Therefore, when the surviving African American soldiers returned to the United States, they still found themselves facing discrimination and prejudice. There was an enormous amount of racial tension in America.

[3]

Garvey had many bold ideas for African Americans. He admired the Black Power and Black Pride movements and also greatly supports the legendary "Back to Africa" movement known as Black Nationalism. He wanted to colonize Africa and make a new displaced homeland in Liberia for all Africans. Garvey believed that the races could never mix and live together in harmony. He despised integration and believed African Americans should own their own businesses, have their own churches, and live in separate and distinct nations from other races.

[4]

Garvey's radical ideas were far from universally popular, even among members of the African American

48. F. NO CHANGE
G. Garvey's radical politics had an international effect
H. Garvey, his politics being radical, had an international effect
J. By being radical, Garvey's politics had an effect that was international

49. A. NO CHANGE
B. would have been in
C. attended
D. went to attend

50. F. NO CHANGE
G. help. Especially
H. help especially
J. help; especially
51. A. NO CHANGE
B. (Do NOT begin new paragraph) However,
C. (Begin new paragraph) Therefore,
D. (Begin new paragraph) However,

52. F. NO CHANGE
G. was greatly supporting of
H. greatly supported
J. was great in his support for

53. A. NO CHANGE
B. (Place before *Liberia*)
C. (Place before *Africa*)
D. (Place before *Africans*)

54. F. NO CHANGE
G. and different
H. and unrelated
J. OMIT the underlined portion.

55. A. NO CHANGE
B. between
C. within
D. beside

community. His most powerful enemies came due to his
controversial stances against the National Association for
the Advancement of Colored People (NAACP) and the
peaceful Civil Rights Movement. Garvey argued that the
NAACP only supported and helped certain members of the
African American population. His harsh comments against
the popular NAACP and the Civil Rights Movement
turned many important people against him.

[5]

However, it must be remembered that he devoted his
life to a cause in which he believed. Garvey's views never
wavered even when he was harshly criticized. Today,
there is a United Negro Improvement Association that
promotes many of the same values that Garvey preached
in the 1920s. Marcus Garvey is dead, but his pride and
goals live on in today's dreamer's, and his writings

continue to inspire leaders around the world. [59]

56. Which of the following alternatives to the underlined portion would NOT be acceptable?
- F. as a result of
 - G. in response to
 - H. in spite of
 - J. because of

57. A. NO CHANGE
B. with which
C. to which
D. by which

58. F. NO CHANGE
G. todays dreamers
H. today's dreamers'
J. today's dreamers

59. Which of the following offers the best introduction to Paragraph 5?
- A. Garvey made many people angry.
 - B. History shows that Garvey performed some imprudent actions during his career.
 - C. The NAACP still exists today.
 - D. As a testament to Garvey's success, his ideas were very bold.

Question 60 asks about the preceding passage as a whole.

60. The writer wishes to include the following sentence in the essay:

He also suggested that the Civil Rights Movement harmed more African Americans than it helped.

That sentence will fit most smoothly and logically into Paragraph:

- F. 2, before the first sentence.
- G. 3, after the last sentence.
- H. 4, before the last sentence.
- J. 5, after the last sentence.

PASSAGE V

A Scientific Argument for Vegetarianism

Vegetarians around the world have many different reasons for choosing to select⁶¹ a meatless diet. While some vegetarians have cultural or religious reasons for not eating meat, others cite animal cruelty and better health as their⁶² reasons for the practice. Indeed, medical studies have proven that a diet rich in fruits and vegetables can decrease the risk of heart disease and most cancers. Some vegetarians see these studies as irrefutable evidence that vegetarianism is the better⁶³ choice for human health.

Recently, while vegetarians⁶⁴ have begun using science to try to convince their friends and neighbors to proliferate⁶⁵ to vegetarianism. Scientists who support the vegetarian lifestyle point out that modern humans are categorized as omnivores – creatures that eat both plants and meat, but humans⁶⁶ have the jaw structure of plant-eating herbivores. In contrast to carnivores' sharp claws and large canine teeth, humans have soft fingernails and very small eyeteeth. It is also a scientific fact that the jaws of most carnivores only move up and down. This jaw motion required by⁶⁷ carnivorous animals to rip chunks from their food and swallow them whole. Vegetarians point out that humans, like herbivores, can move their jaws from side to side. This jaw structure is well suited for chewing plant material. Some biologists argue for⁶⁸ animal species sharing physical characteristics should also naturally share similar diets. By this logic, vegetarians win their argument. It is also known that carnivorous animals have exceptionally

61. A. NO CHANGE
B. choosing and selecting
C. choosing
D. selecting to choose
62. F. NO CHANGE
G. its
H. they're
J. such
63. A. NO CHANGE
B. best
C. good
D. OMIT the underlined portion.
64. F. NO CHANGE
G. Recently, because vegetarians
H. Recently, vegetarians
J. Recently, becoming a vegetarian
65. A. NO CHANGE
B. synchronize
C. prosper
D. convert
66. F. NO CHANGE
G. meat – but humans
H. meat. Humans
J. meat; but, humans
67. A. NO CHANGE
B. requiring
C. requires
D. requires that
68. F. NO CHANGE
G. from
H. which
J. that

acidic stomachs that allow it⁶⁹ to break down flesh and kill bacteria. Some argue that because the human stomach acids are not nearly as potent, humans are better suited for digesting plant material. It is our weaker stomach acids that force humans to cook most of our meat. 70

In addition,⁷¹ scientists acknowledge that carnivores have significantly shorter intestinal tracts. Most carnivores have intestinal tracts that are only three to six times the length of their bodies. Shorter intestinal tracts allow meat to be digested very quick.⁷² This prevents any eaten meat from rotting in the intestine or causing digestive difficulties. Humans have a much longer intestinal tract, including⁷³ both the small and large intestines. Some medical research shows that meat actually starts to rot while it is being digested. While this process rarely does harm, vegetarians argue that it proves our long intestines are designed to ensure that we can break down and absorb nutrients within⁷⁴ fibrous plant material, not animal flesh.

Even if people are not particularly persuaded by the physical differences between carnivores and humans to become vegetarians, they are⁷⁵ undeniable that eating more fruits and vegetables is beneficial to almost everyone. The additional fiber and nutrients provided can keep our digestive processes running smoothly.

69. A. NO CHANGE
B. them
C. one
D. for

70. Which of the following, if added here, would most effectively support the assertion made in the previous sentence?
- F. The human stomach secretes up to 3 liters of gastric acid per day.
G. Humans are incapable of eating and digesting raw meat.
H. Cooking helps to kill bacteria and makes the flesh more easily digestible.
J. Cooking can be time consuming, but most humans prefer to eat cooked meat.

71. A. NO CHANGE
B. On the other hand
C. Consequently
D. Therefore

72. F. NO CHANGE
G. fastest
H. quickly
J. quickest

73. Which of the following alternatives to the underlined portion would NOT be acceptable?
- A. tract, which includes
B. tract, this includes
C. tract. It includes
D. tract; it includes

74. F. NO CHANGE
G. that
H. by
J. from

75. A. NO CHANGE
B. it is
C. it being
D. they were

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. A detergent is manufactured using only the three ingredients A, B, and C, which are mixed in the ratio of 1:4:5, respectively, by weight. How many pounds of ingredient A are in a 80-pound (net weight) bucket of this detergent?

A. 4.8
B. 8.0
C. 16.5
D. 32.0
E. 40.0

2. Which of the following expressions is equivalent to $(3x - 7)(x + 2)$?

F. $3x^2 + 9x + 14$
G. $3x^2 + 9x - 14$
H. $3x^2 - 9x + 14$
J. $3x^2 - x - 14$
K. $3x^2 + x - 14$

3. Let a function of 2 variables be defined by $g(x, y) = xy - (x + y)$. What is the value of $g(7, 8)$?

A. 21
B. 27
C. 41
D. 53
E. 71

4. What is $\frac{1}{6}$ of 26% of \$9,000?

F. \$15,500
G. \$3,900
H. \$1,550
J. \$390
K. \$39

5. If $2x + 18 = 3 + 5x$, then $x = ?$

A. 7
B. 5
C. 3
D. -5
E. -7

DO YOUR FIGURING HERE.



DO YOUR FIGURING HERE.

6. The second term of an arithmetic sequence is -12 , and the third term is -36 . What is the first term?

(Note: In an arithmetic sequence, consecutive terms differ by the same amount.)

F. -18

G. -9

H. -4

J. $\frac{1}{4}$

K. 12

7. A bag contains 56 marbles. Each marble is either red, green, or yellow. A marble is randomly removed from the bag and then returned to the bag. The probability that this marble is red is $\frac{5}{8}$. The probability that this marble is green is $\frac{1}{7}$. How many yellow marbles are in the bag?

A. 43

B. 24

C. 19

D. 13

E. 5

8. Given $g(x) = x^2 - 2x + 6$, what is $g(x - h)$?

F. $x^2 - 2x + 2h + 6$

G. $x^2 - h^2 - 2x - 2h + 6$

H. $x^2 - h^2 - 2x + 2h + 6$

J. $(x - h)^2 - 2x - 2h + 6$

K. $(x - h)^2 - 2x + 2h + 6$

9. A square has the same perimeter as a regular heptagon (a seven-sided polygon with all sides congruent and all interior angles congruent). If one side of the square is 119 millimeters long, how many millimeters long is one side of the heptagon?

A. 833

B. 476

C. 238

D. 119

E. 68



DO YOUR FIGURING HERE.

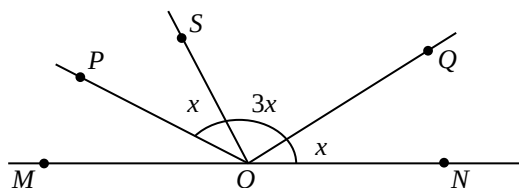
10. Two employees were hired to begin work at the same time. Employee A's contract called for a starting salary of \$22,300 with an increase of \$750 after each year of employment. Employee B's contract called for a starting salary of \$16,900 with an increase of \$1,080 after each year of employment. If x represents the number of full years of employment (that is, the number of yearly increases each worker has received), which of the following equations could be solved to determine the number of years until B's yearly salary equals A's yearly salary?

- F. $750x + 1,080x = 16,900$
 G. $750x + 1,080x = 22,300$
 H. $750x + 1,080x = x$
 J. $22,300 + 1,080x = 16,900 + 750x$
 K. $22,300 + 750x = 16,900 + 1,080x$

11. Which of the following is equivalent to $(\cos\theta)(\sec(-\theta))$ wherever $(\cos\theta)(\sec(-\theta))$ is defined?

- A. 1
 B. -1
 C. $-\tan\theta$
 D. $\tan\theta$
 E. $-\cos^2\theta$

12. The measure of $\angle NOP$ in the figure below is 150° . The measures of the three angles are given in terms of x , in degrees. What is the measure of $\angle QOP$?



- F. 150°
 G. 120°
 H. 90°
 J. 60°
 K. 30°
13. A Celsius thermometer inside reads 22°C . The temperature is 8°C warmer outdoors. What is the outdoor temperature, F , in degrees Fahrenheit?

(Note: $C = \frac{5}{9}(F - 32)$)

- A. 49°F
 B. 72°F
 C. 80°F
 D. 84°F
 E. 86°F



14. If $m + n = 5$ and $p = 4m - 7 + 4n$, then $p = ?$

F. -9
G. -2
H. 13
J. 31
K. 42

DO YOUR FIGURING HERE.

15. A triangle, $\triangle PQR$, is reflected across the y -axis to have the image $\triangle P'Q'R'$, in the standard (x, y) coordinate plane; thus P reflects to P' . The coordinates of point P are $(-m, n)$. What are the coordinates of point P' ?

A. (m, n)
B. $(m, -n)$
C. $(-m, n)$
D. $(-m, -n)$
E. Cannot be determined from the given information.

16. To get to the grocery store from her house, Skylar must drive her car 5 miles south and then 12 miles west. What is the shortest distance, in miles, between Skylar's house and the grocery store?

F. 2
G. 4
H. 7
J. 13
K. 15

17. An industrial sewing machine can add a stitch to a seam in 0.000035 seconds. This machine can add 1,000,000 stitches to a seam in how many seconds?

A. 350
B. 35
C. 3.5
D. 0.35
E. 0.035

18. Doug's patio is 11 feet wide by 15 feet long. He wants to increase the area by 120 square feet by increasing the width and length by the same amount. What will be the new dimensions (width by length), in feet?

F. 15×19
G. 19×19
H. 19×30
J. 21×27
K. 23×25

19. The interior angles of a triangle are 3 consecutive even integers. What is the largest interior angle?

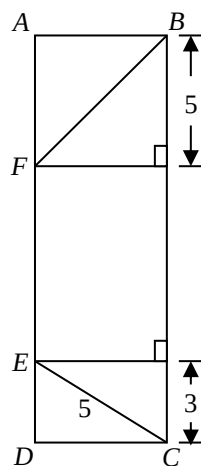
A. 56°
B. 58°
C. 60°
D. 62°
E. 64°

20. In the standard (x, y) coordinate plane, what is the slope of the line with equation $3y - 12x = 6$?

F. -4
G. 3
H. 4
J. 6
K. 12



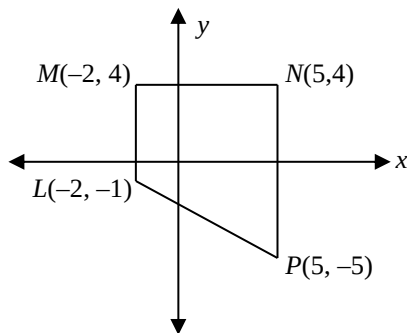
21. In the figure below, points A , F , E , and D are collinear, and distances marked are in feet. The area of rectangle $ABCD$ is 60 square feet. What is the area of trapezoid $BFEC$, in square feet?



- A. 44
B. 55
C. 77
D. 88
E. 110

Use the following information to answer questions 22-24.

Quadrilateral $LMNP$ is shown below in the standard (x, y) coordinate plane. For this quadrilateral, $LP = \sqrt{65}$, $PN = 9$, $NM = 7$, and $ML = 5$, all in coordinate units.



22. What is the length of PM in coordinate units?

- F. 4
G. 16
H. $\sqrt{32}$
J. $\sqrt{65}$
K. $\sqrt{130}$

23. Which of the following is closest to the perimeter of quadrilateral $LMNP$, in coordinate units?

- A. 21.0
B. 25.0
C. 29.1
D. 32.5
E. 49.0

DO YOUR FIGURING HERE.



24. Which of the following are the coordinates of the image of M under a 90° clockwise rotation around the origin?

F. $(-4, -2)$
 G. $(-2, 4)$
 H. $(2, -4)$
 J. $(2, 4)$
 K. $(4, 2)$

DO YOUR FIGURING HERE.

25. What is the slope of any line perpendicular to the line $5x + 7y = 4$?

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

26. What is the coefficient of x^{13} in the product of the two polynomials below?

$$(3x^7 - 3x^6 - x^5 + 9x^4 - 2x^3 + x^2 - 5x)(2x^6 - x^4 + 3x^2 - 3x - 1)$$

F. 9
 G. 6
 H. 5
 J. 3
 K. 2

Use the following information to answer questions 27-28.

Mr. Hernandez's students filled out a survey asking how many hours each student watched television over 7 days. The results from the survey are shown below in a stem-and-leaf plot.

Stem	Leaf
0	4 5 7
1	0 2 2 4 4 4 5 6 6 6 8 9
2	1 1 1 1 4 8

(Note: For example, 12 hours of television watched would have a stem value of 1 and a leaf value of 2, 24 hours of television would have a stem value of 2 and a leaf value of 4, etc.)

27. Which of the following is the median number of hours of television watched during the week?

A. 6
 B. 12
 C. 15.5
 D. 16
 E. 21



28. If a student represented in the stem-and-leaf plot is selected randomly, what is the probability that the student watches 21 hours of television a week?

- F. $\frac{2}{21}$
 G. $\frac{4}{21}$
 H. $\frac{8}{21}$
 J. $\frac{21}{328}$
 K. $\frac{84}{328}$

DO YOUR FIGURING HERE.

29. What is the least common multiple of 6, $7y$, $4x^2$, and $3xy$?

- A. $42x^3y^2$
 B. $84x^2y$
 C. $84x^3y^2$
 D. $168x^2y^2$
 E. $168x^3y^2$

30. If 4 times a number x is subtracted from 12, the result is negative. Which of the following gives the possible value(s) for x ?

- F. All $x > 3$
 G. All $x < 3$
 H. 8 only
 J. 3 only
 K. 0 only

31. A line in the standard (x, y) coordinate plane contains the points $J(7, -2)$ and $K(-5, 8)$. What is the midpoint of JK ?

- A. (1, 3)
 B. (2, 6)
 C. (3, 1)
 D. (6, 7)
 E. (12, 14)

32. For $y^2 \neq 121$, $\frac{(y+11)^2}{(y^2-121)} = ?$

- F. $\frac{(y+11)}{(y-11)}$
 G. $\frac{1}{(y+11)}$
 H. $\frac{1}{(y-11)}$
 J. $-\frac{1}{11}$
 K. -1



DO YOUR FIGURING HERE.

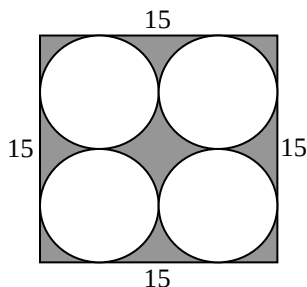
33. The larger of two numbers exceeds three times the smaller number by 2. The sum of twice the larger and 4 times the smaller is 73. If a is the smaller number, which equation below determines the correct value of a ?

A. $4(3a - 2) + 2a = 73$
 B. $4(3a + 2) + 2a = 73$
 C. $(6a + 2) + 4a = 73$
 D. $2(3a + 2) + 4a = 73$
 E. $2(3a - 2) + 4a = 73$

34. When $\frac{m}{n} = 9$, $m^2 - 64n^2 = ?$

F. $-23n^2$
 G. $-17n^2$
 H. 1
 J. $17n^2$
 K. $23n^2$

35. A 15-foot square box of cardboard used to hold four drinking cups is shown below. Each cup is tangent to two other cups and tangent to two of the edges of the box. What is the approximate area, in square feet, of the bottom of the cardboard box that is not covered by a cup, as indicated by the shaded region below?



A. 48.3
 B. 56.9
 C. 101.1
 D. 119.8
 E. 128.7

36. Which of the following lists gives the 3 smallest prime numbers that are greater than 60?

F. 61, 63, and 65
 G. 61, 63, and 67
 H. 61, 67, and 71
 J. 61, 67, and 73
 K. 63, 67, and 71

37. The median of a set of data containing five items was found. Six data items were added to the set. Three of these items were greater than the original median, and the other three items were less than the original median. Which of the following statements *must* be true about the median of the new data set?

A. It is the average of the three new lower values.
 B. It is the same as the original median.
 C. It is the average of the three new higher values.
 D. It is greater than the original median.
 E. It is less than the original median.



38. At a time when the sun's rays are striking the level ground at an angle of 35° , a statue casts a shadow that is 81 feet long. To the nearest foot, how many feet tall is the statue?

(Note: $\sin 35^\circ \approx 0.57$, $\cos 35^\circ \approx 0.82$, $\tan 35^\circ \approx 0.70$)

- F. 66
- G. 57
- H. 46
- J. 39
- K. 31

39. In the 2×2 matrix below, g_1 and g_2 are the costs per pound of gruyere cheese at Store 1 and Store 2, respectively; c_1 and c_2 are the costs of camembert cheese at these two stores, respectively. In the following matrix product, what does y represent?

$$\begin{bmatrix} 1.5 & 1.5 \end{bmatrix} \cdot \begin{bmatrix} g_1 & c_1 \\ g_2 & c_2 \end{bmatrix} = \begin{bmatrix} x & y \end{bmatrix}$$

- A. The cost of r_1 pounds of gruyere cheese at \$1.50 per pound.
- B. The cost of 1.5 pounds of gruyere cheese at Store 1.
- C. The total cost of 1.5 pounds of gruyere and 1.5 pounds of camembert at Store 1.
- D. The total cost of 1.5 pounds of gruyere and 1.5 pounds of camembert at Store 2.
- E. The total cost of 1.5 pounds of camembert at Store 1 and 1.5 pounds of camembert at Store 2.

40. What is the largest integer value of x that satisfies the inequality $\frac{14}{18} > \frac{x}{10}$?

- F. 2
- G. 4
- H. 5
- J. 6
- K. 7

41. A data set contains 7 integers. The median of the data is 7. The only mode of the data set is 8. The mean of the data set is 6. Which of the following statements *must* be true about the data set?

- A. The sum of the 7 integers is 56.
- B. The sum of the 7 integers is 42.
- C. The median of the 4 largest integers is 7.
- D. The largest integer is 9.
- E. The largest integer is 11.

42. The ratio of the radii of two circles is 3:5. What is the ratio of their circumferences?

- F. 1:2
- G. 3:5
- H. 9:25
- J. $3:6\pi$
- K. $5:10\pi$

DO YOUR FIGURING HERE.



43. If $a = b + 3$, then $(b - a)^3 = ?$

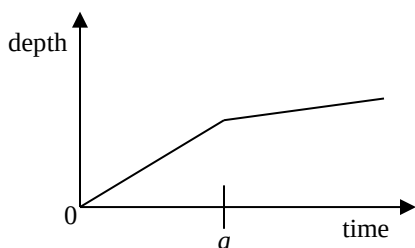
A. -27
 B. -9
 C. 1
 D. 9
 E. 27

DO YOUR FIGURING HERE.

44. In $\triangle ABC$, $AB \cong AC$ and the measure of $\angle C$ is 29° . What is the measure of $\angle A$?

F. 122°
 G. 100°
 H. 60°
 J. 58°
 K. 29°

45. A bathtub of uniform depth is being filled. When the bathtub started filling, its drain was closed. The graph below shows the depth of the water in the bathtub as a function of the length of time that water has been flowing into the bathtub.



Exactly 1 event occurred at time a that changed the rate at which the depth was increasing. Which of the following could have been that event?

- I. The flow of water into the tub was increased.
 II. The flow of water into the tub was decreased.
 III. The drain was closed.

A. I only
 B. II only
 C. III only
 D. I or II only
 E. II or III only

46. If $\tan B = \frac{b}{c}$, $b > 0$, $c > 0$, and $0 < B < \frac{\pi}{2}$, then what is

$\sin B$?

F. $\frac{b}{c}$
 G. $\frac{c}{b}$
 H. $\frac{b}{\sqrt{b^2 + c^2}}$
 J. $\frac{c}{\sqrt{b^2 + c^2}}$
 K. $\frac{\sqrt{b^2 + c^2}}{b}$



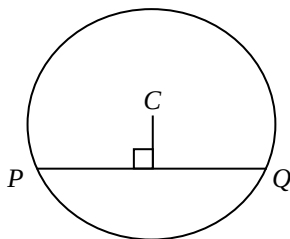
DO YOUR FIGURING HERE.

47. The fraction $\frac{6}{7}$ is equivalent to $0.\overline{857142}$. What is the digit in the 905th decimal place of $0.\overline{857142}$?

(Note: The digit in the 3rd decimal place of $0.\overline{857142}$ is 7.)

- A. 1
B. 2
C. 4
D. 5
E. 7

48. In the circle below, C is the center. Chord PQ is 16 meters long and is 6 meters from C . What is the circumference, in meters, of the circle?

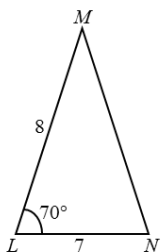


- F. 5π
G. 10π
H. 16π
J. 20π
K. 32π

49. What is the x -intercept of the line that contains the points $(-4, 1)$ and $(-7, 2)$ in the standard (x, y) coordinate plane?

- A. $(-1, 0)$
B. $(0, -1)$
C. $(0, 1)$
D. $(0, 3)$
E. $(1, 0)$

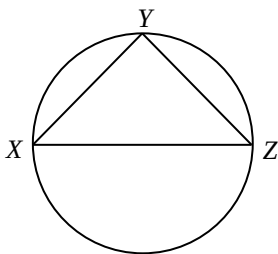
50. Which of the following expressions gives the area, in square feet, of $\triangle LMN$, shown below with the given side lengths in feet?



- F. $28 \sin 70^\circ$
G. $28 \cos 70^\circ$
H. $28 \tan 70^\circ$
J. $56 \sin 70^\circ$
K. $56 \cos 70^\circ$



51. In the figure below, $XY = YZ$, and XZ is a diameter of the circle, having a length of 10 inches. What is the area of $\triangle XYZ$, in square inches?



- A. 15
B. 25
C. 50
D. $\sqrt{50}$
E. $25\sqrt{2}$
52. The graph of $y = \cos x$ in the standard (x, y) coordinate plane is reflected over the x -axis, shifted down a units, and then shifted right π units. Which of the following equations represents the graph after the 3 transformations?
- F. $y = \cos(x - \pi) - a$
G. $y = \cos(x - \pi) + a$
H. $y = -\cos(x + \pi) - a$
J. $y = -\cos(x - \pi) - a$
K. $y = -\cos(x + \pi) + a$

53. The length of a rectangle is 6 more than two times the width of the rectangle. If the area of the rectangle is 176, what is the length of the rectangle?

- A. 6
B. 8
C. 11
D. 22
E. 30

54. The length of arc AB is $\frac{1}{4}$ of the circumference of a circle. The length of the arc is 12π inches. What is the area, in square inches, of the circle?

- F. 12π
G. 24π
H. 48π
J. 144π
K. 576π

55. If $x = 3n - 6$ and $y = 4 - n$, which of the following expresses y in terms of x ?

- A. $y = \frac{6-x}{3}$
B. $y = \frac{18-x}{3}$
C. $y = 10 - 3x$
D. $y = 4 - x$
E. $y = 6 - x$

DO YOUR FIGURING HERE.



56. A function is defined by $f(x) = -x^5$. Which of the following is an expression for $f(f(x))$?

F. x^{25}
 G. x^{10}
 H. x^5
 J. $-x^{10}$
 K. $-x^{25}$

DO YOUR FIGURING HERE.

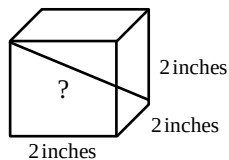
57. Which of the following polar coordinates represents the same location as $(10, 120^\circ)$?

A. $(10, -360^\circ)$
 B. $(10, -300^\circ)$
 C. $(10, -240^\circ)$
 D. $(10, -120^\circ)$
 E. $(10, 30^\circ)$

58. What is the distance, in coordinate units, between $-3 + 4i$ and $2 + 2i$ in the complex plane?

F. 4
 G. 6
 H. $\sqrt{15}$
 J. $\sqrt{29}$
 K. $\sqrt{41}$

59. A cube with edges 2 inches long is shown below. What is the length, in inches, of a diagonal that runs from one corner of the cube to the opposite corner?

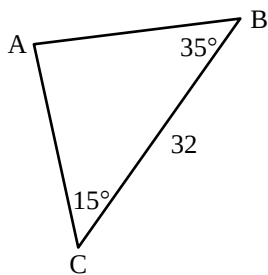


A. 2
 B. $2\sqrt{2}$
 C. $2\sqrt{3}$
 D. $3\sqrt{2}$
 E. 4



60. In the figure below, what is the distance between point A and point B ?

DO YOUR FIGURING HERE.



- F. $\frac{\sin 35^\circ}{32 \sin 15^\circ}$
- G. $\frac{\sin 35^\circ}{32 \sin 130^\circ}$
- H. $\frac{32 \sin 15^\circ}{\sin 35^\circ}$
- J. $\frac{32 \sin 35^\circ}{\sin 15^\circ}$
- K. $\frac{32 \sin 15^\circ}{\sin 130^\circ}$

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 L Frank Baum's *American Fairy Tales: The Box of Robbers*, © 1906.

No one intended to leave Martha alone that afternoon, but it happened that everyone was called away, for one reason or another. Mrs. McFarland was attending the weekly card party held by the Women's Anti-Gambling League. Sister Nell's young man had called quite unexpectedly to take her for a long drive. Papa was at the office, as usual. It was Mary Ann's day out. As for Emeline, she certainly should have stayed in the house and looked after the little girl; but Emeline had a restless nature.

"Would you mind, miss, if I just crossed the alley to speak a word to Mrs. Carleton's girl?" she asked Martha.

"Course not," replied the child. "You'd better lock the back door, though, and take the key, for I shall be upstairs."

"Oh, I'll do that, of course, miss," said the delighted maid, and ran away to spend the afternoon with her friend, leaving Martha quite alone in the big house, and locked in, into the bargain.

The little girl read a few pages in her new book, sewed a few stitches in her embroidery, and started to "play visiting" with her four favorite dolls. Then she remembered that in the attic was a doll's playhouse that hadn't been used for months, so she decided she would dust it and put it in order.

Filled with this idea, the girl climbed the winding stairs to the big room under the roof. It was well lighted by three dormer windows and was warm and pleasant. Around the walls were rows of boxes and trunks, piles of old carpeting, pieces of damaged furniture, bundles of discarded clothing, and other odds and ends of more or less value. Every well-regulated house has an attic of this sort, so I need not describe it.

The doll's house had been moved, but after a search Martha found it way over in a corner near the big chimney. She drew it out and noticed that behind it was a black wooden chest, which Uncle Walter had sent over

from Italy years and years ago—before Martha was born, in fact. Mamma had told her about it one day; how there was no key to it, because Uncle Walter wished it to remain unopened until he returned home; and how this wandering uncle, who was a mighty hunter, had gone into Africa to hunt elephants and had never been heard from afterwards. The little girl looked at the chest curiously, now that it had by accident attracted her attention.

It was quite big—bigger even than Mamma's traveling trunk—and was studded all over with tarnished brass-headed nails. It was heavy, too, for when Martha tried to lift one end of it she found she could not stir it a bit. But there was a place in the side of the cover for a key. She stooped to examine the lock, and saw that it would take a rather big key to open it.

Then, as you may suspect, the little girl longed to open Uncle Walter's big box and see what was in it. For we are all curious, and little girls are just as curious as the rest of us.

"I don't b'lieve Uncle Walter'll ever come back," she thought. "Papa said once that some elephant must have killed him. If I only had a key." She stopped and clapped her little hands together happily as she remembered a big basket of keys on the shelf in the linen closet. They were of all sorts and sizes; perhaps one of them would unlock the mysterious chest!

She flew down the stairs, found the basket, and returned with it to the attic. Then she sat down before the brass-studded box and began trying one key after another in the curious old lock. Some were too large, but most were too small. One would go into the lock but would not turn; another stuck so fast that she feared for a time that she would never get it out again. But at last, when the basket was almost empty, an oddly shaped, ancient brass key slipped easily into the lock. With a cry of joy Martha turned the key with both hands; then she heard a sharp "click," and the next moment the heavy lid flew up of its own accord!

The little girl leaned over the edge of the chest an instant, and the sight that met her eyes caused her to start back in amazement. Slowly and carefully a man unpacked himself from the chest, stepped out upon the floor, stretched his limbs and then took off his hat and bowed politely to the astonished child.

1. According to the narrator, Martha's mother told her the black wooden chest had no key because:
 - A. Martha's Uncle Walter had taken the key with him to Africa.
 - B. Martha's Uncle Walter wanted it to stay locked until he returned for it.
 - C. Martha was too young to play with the chest by herself.
 - D. Martha was not interested in opening the chest.
2. Considering the events of the entire passage, it is most reasonable to infer that the narrator says "little girls are just as curious as the rest of us" (lines 55-56) because he believes:
 - F. it was dangerous for Martha to have been left alone.
 - G. it is wrong to search through others' belongings.
 - H. anyone would be curious to see what was inside the wooden chest.
 - J. Emeline would have stopped Martha from opening the wooden chest.
3. Martha can most accurately be characterized as:
 - A. friendly but withdrawn.
 - B. shy and cautious.
 - C. well-behaved but inquisitive.
 - D. self-centered and arrogant.
4. Which of the following statements best describes the relationship between Martha and her Uncle Walter?
 - F. Martha admires her adventurous Uncle Walter, but secretly thinks he takes too many risks.
 - G. Martha is a favorite niece who loves her adventurous Uncle Walter dearly.
 - H. Martha misses her Uncle Walter and wishes that he could return soon to help her open the wooden chest.
 - J. Martha knows her Uncle Walter by reputation only, and is more interested in his wooden chest than she is in him.
5. Which of the following does the passage suggest is the reason that Emeline left Martha alone?
 - A. Emeline was bored by the prospect of staying in all day.
 - B. Emeline wanted to read her new book, but had left it at her friend's house.
 - C. Emeline was called away quite unexpectedly.
 - D. Emeline was unconcerned with Martha's safety.
6. The phrase "slowly and carefully a man unpacked himself from the chest" (lines 78-79) most strongly suggests that the man:
 - F. had painstakingly packed the chest with his belongings.
 - G. was unable to get out of the chest after such a long time.
 - H. had been folded up to fit in a tight space.
 - J. was very eager to get out of the chest.
7. The narrator describes the key to the chest as an "oddly-shaped, ancient brass key" (lines 71-72). What does this description imply about the chest itself?
 - A. The chest has magical powers that forced Martha to open it.
 - B. The chest contains African treasures that Martha considers special.
 - C. The chest is dangerous and should be avoided.
 - D. The chest is very old and mysterious.
8. The description of the attic implies that it was:
 - F. cold and uninteresting.
 - G. sunny and inviting.
 - H. frightening and mysterious.
 - J. dark and musty.
9. As it is used in line 32, the word *well-regulated* most nearly means:
 - A. professional.
 - B. law-abiding.
 - C. orderly and organized.
 - D. supervised and controlled.
10. Martha remembered the doll's playhouse in the attic immediately after:
 - F. she told Emeline to lock the door.
 - G. she sewed a few stitches in her embroidery.
 - H. she read a few pages in her new book.
 - J. she started to "play visiting" with her four favorite dolls.

Passage II

SOCIAL SCIENCE: The following two excerpts discuss Mount Rushmore, a mountain in the Black Hills of western South Dakota and its monument with massive carved likenesses of George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt, carved under the direction of Gutzon Borglum (1867-1941). Passage 1 was written by the South Dakota Office of Tourism. Passage 2 was written by the senior editor of a nonpartisan monthly magazine on politics and culture.

Passage A by the South Dakota Office of Tourism

Line It started as an idea to draw sightseers. In 1923 state
historian Doane Robinson suggested carving some giant
statues in South Dakota's Black Hills. Robinson wanted
his sculptures to stand at the gateway to the West, where
5 the Black Hills rise from the plains as a geographical
prelude to the Rockies. So they called in the master
sculptor of Stone Mountain.¹

In an era when many artists scorned traditional
patriotism, Gutzon Borglum made his name through
10 celebration of things American. Among his earlier works
were a remodeled torch for the Statue of Liberty, saints
and apostles for the Cathedral of St. John in New York, a
seated Lincoln in Newark, and an oversized Lincoln bust
for the U.S. Capitol. In 1915 he began the Stone Mountain
15 memorial, which brought experience in large-scale granite
carving – and in showmanship.

Borglum scouted out the location: 5,725-foot Mount
Rushmore. Its broad wall of exposed granite faced
southeast to receive direct sunlight for most of the day.
20 Borglum's choice of subjects promised to elevate the
memorial from a regional enterprise to a national cause
“in commemoration of the foundation, preservation and
continental expansion of the United States.”

Gutzon Borglum's vision for Mount Rushmore was no
25 less than the formal rendering of the philosophy of our
government into granite on a mountain peak. His
monument to America was a grouping of four leaders –
Washington, Jefferson, Lincoln, and Roosevelt – who
brought the country from colonial times into the twentieth
30 century. President Calvin Coolidge dedicated the memorial
in 1927, commencing fourteen years of work.

Everyone wanted to see the men on the mountain.
Gutzon Borglum, who regarded his masterpiece as far
more than a tourist attraction, was no doubt reassured
35 when the phrase “Shrine of Democracy” was coined at the

1930 dedication of the Washington head. “A monument's
dimensions,” said Borglum, “should be determined by the
importance to civilization of the events commemorated . . .
Let us place there, carved high, as close to heaven as we
40 can, the words of our leaders, their faces, to show posterity
what manner of men they were. Then breathe a prayer that
these records will endure until the wind and the rain alone
shall wear them away.”

From then on Mount Rushmore's role as an American
45 icon has been unquestioned, but how successful is the
memorial as a work of art? Consider the assessment of
another individual who made a name blending art and
nature: “The noble countenances emerge from Rushmore,”
wrote architect Frank Lloyd Wright, “as though the spirit
50 of the mountain heard a human plan and itself became a
human countenance.”

Passage B by a magazine on politics and culture

Unlike the presidential statuary and monuments that
festooned Washington and later became tourist attractions,
Mount Rushmore's quartet of colossal faces was
55 conceived as a tourist attraction (to bolster the faltering
local economy) and only afterward took on deeper
monumental meaning. For people who perceive it in grand
terms, Rushmore is a patriotic psalm in stone, one that
catches the national spirit in the true national setting, as
60 opposed to a memorial set in a corrupt, bureaucratized
capital.

In South Dakota, the faces of American greatness loom
over the vast plain and stare serenely into . . . what? A
still-unfolding destiny manifest only to the carved heroes'
65 ever-open eyes? Or are these same icons unwilling
witnesses to the mess that later generations have made of
their shared presidential achievement?

There's always been a camp of people who regard
Rushmore as little more than big kitsch², and not very
70 American kitsch at that. To them, taking a perfectly good
Dakota mountain and carving really huge faces on it seems
a rather Pharaonic³ sort of enterprise that is not merely in
bad taste but inconsistent with the republican ideals the
result is supposed to celebrate. It isn't that Washington,
75 Jefferson, and the rest don't deserve grand
memorialization; they certainly do. But Rushmore's serene
faces on the plains invite, for some, great-man cultism, if
not an overtly quasi-religious reaction.

There are new, emerging ways to perceive Rushmore, too, thus suggesting that the monument has a vital place in the national imagination. One of these new ways is as an unfinished work. That is, some people see the mountain as a legitimate tableau of American greatness to which they hope to add their own favorite president. Certain of Ronald Reagan's enthusiasts, for example, have lobbied to have their man's face added.

It may come as a surprise to many that, for a few people, Mount Rushmore is actually a place of evil. A New York-based grad student named Jesse Lerner has written a book attempting to expose the mountain's negative side as "a monument to whiteness." Here, argues Lerner, is a revered place of pilgrimage in the middle of Lakota Sioux country, portraying four men who, whatever their other achievements, "were deeply involved in the national project of wiping out the American Indian." Here is a grand sculpture created by an obsessed man, Borglum, who was "a high-ranking member of the Ku Klux Klan and a virulent racist." Indeed, here is a "mountain that came into the possession of the United States through the breaking of an 1868 treaty with the Lakota."

Is it true that Rushmore's racially charged backstory must affect its message? It might be true if Rushmore had only a single message to express. But obviously Mount Rushmore plays a more complex role than that. Like everything that emerges at the hand of man, its meaning is fluid. The point of an effort like Lerner's is not so much that he is revealing Rushmore's true meaning; it is that he is expanding the range of Rushmore's numerous and often conflicting meanings.

¹a Confederate memorial consisting of the equestrian figures of Robert E. Lee, Stonewall Jackson, and Jefferson Davis carved on the northern face of a granite dome northeast of Atlanta, GA

²an artistic work considered pretentious and tasteless

³of or relating to the ancient Egyptian kings

Questions 11–13 ask about Passage A.

11. The primary purpose of the second paragraph (lines 8–16) of Passage A is to
- A. present facts that led to the selection of Borglum.
 - B. clarify misunderstood aspects of Borglum's biography.
 - C. celebrate Borglum's artistic contributions to America.
 - D. scrutinize Borglum's aesthetic philosophy.

12. As indicated in Passage A, Borglum considered his creation of the Rushmore monument an act of

- F. noble servitude.
- G. apt glorification.
- H. reluctant compromise.
- J. subtle exaltation.

13. Passage A claims that Mount Rushmore was a suitable location for Borglum's monument because of its

- A. proximity to plentiful resources and inexpensive labor.
- B. historical significance.
- C. visual properties.
- D. ties to Native American culture.

Questions 14–16 ask about Passage B.

14. The author of Passage B uses the notion of the Rushmore figures' "ever-open eyes" (line 65) as a means for

- F. considering how all past presidents might respond to the current condition of America.
- G. describing the prophetic character of America's greatest leaders.
- H. impressing upon the reader a sense of the monument's majestic beauty.
- J. asserting that America has lost touch with the principles on which it was founded.

15. Which of the following statements best expresses the criticism leveled against the appearance of "Washington, Jefferson, and the rest" on the Rushmore monument in the third paragraph (lines 68–78) of Passage B?

- A. Praising them as godlike figures violates the American practice of the separation of church and state.
- B. Their achievements, while substantial, do not warrant commemoration on such a grand scale.
- C. Exalting individual men above the general populace is contrary to the spirit of American democracy.
- D. The desecration of natural beauty conflicts with the leaders' environmental policies.

16. Passage B is developed through

- F. presentations of differing perspectives.
- G. quotations from specific texts.
- H. extended treatment of a specific example.
- J. interpretation of abstract concepts.

Questions 17–20 ask about both passages.

17. Which aspect of the Rushmore monument seems to matter a great deal in Passage A, but not in Passage B?
- A. The intentions of its creator.
 - B. Its location.
 - C. The values it embodies.
 - D. Its artistic merit.
18. Both passages suggest which of the following about the American leaders depicted on the Rushmore monument?
- F. Their depiction on the monument is tainted by the manner in which the site was acquired from American Indians.
 - G. Some aspects of their historical legacy are questionable.
 - H. Their positive achievements warrant their memorialization.
 - J. Their appearance should be supplemented by other American leaders of similar stature.
19. The author of Passage B would most likely claim that line 32 (“Everyone . . . mountain”) of Passage A is misleading because it
- A. drastically oversimplifies ideas presented in Passage A.
 - B. ignores the original intentions for the monument.
 - C. suggests that no one disapproved of the monument.
 - D. implies the monument exists only as a tourist attraction.
20. Which of the following statements provides the most accurate description of the tone of each passage?
- F. Passage A is informational, while Passage B provides conflicting viewpoints.
 - G. Passage A is fondly nostalgic, while Passage B is impersonal and scientific.
 - H. Both passages begin by conveying some sense of the narrator's wonder but conclude with a note of disenchantment.
 - J. Both passages begin by conveying the narrator's doubt but conclude with some sense of lasting pride.

Passage III

HUMANITIES: Artists of the Harlem Renaissance

The Harlem Renaissance was an African American cultural movement of the 1920s and early 1930s that was centered in the Harlem neighborhood of New York City, though its adherents could be found across the United States and frequently studied in Europe. Various known as the New Negro movement, the New Negro Renaissance, and the Negro Renaissance, the movement emerged toward the end of World War I in 1918, blossomed in the mid- to late 1920s, and then faded in the mid-1930s with the rise of the Depression.

The Harlem Renaissance marked the first time that mainstream publishers and critics took African American literature seriously, and that African American literature and arts attracted significant attention from the nation at large. Although primarily a literary movement, it was closely related to developments in African American music, theater, art, and politics. The Harlem Renaissance provided a stage for the performance of issues of race and culture deeply personal to the African American community. These performances could be directed inward to the African American community itself, or outward to the majority White population. They could be celebrations of identity or protests of cruelty and discrimination.

Fluidity was a profound asset of the Harlem Renaissance and was experienced over and over in myriad ways. One significant aspect of the movement was the way it allowed artists to transition in and out of it. In short, the movement was fluid enough to encompass strict practitioners as well as those who inhabited it only for moments of inspiration. It also provided a place for African Americans to explore both their European and African cultural heritage, even bringing them together in striking, sometimes not entirely successful, marriages of diverse traditions.

One of the artists most influenced by this movement was author Countee Cullen. Having received a masters degree in English and French from Harvard University, Cullen was an early success of the Harlem Renaissance and was one of the first African American writers to cross over into mainstream White awareness, while being an educated Black poet. His success is even more remarkable in that it occurred in a time when “Black poet” was considered a contradiction in terms.

Cullen’s literary preferences led him to address Black issues in a White framework. Though his poetry explored the plight of African Americans, Cullen worked almost exclusively in traditional, European literary structures, including sonnets and ballads. Indeed, his writing style was heavily influenced by English Romantic poets such as Keats and Shelley, even while his content was based in the African American experience and frequently addressed contemporary social problems. The results were sometimes socially and critically controversial. Cullen’s collection, *The Black Christ and Other Poems*, caused some literary critics to be offended by the way he co-opted religious imagery for secular purposes. Others

argued that Cullen’s insistence on traditional style bogged down a work that should have soared with thematic resonance.

Regardless, Cullen’s writing remains influential as an example of the artistic and cultural explosion prevalent at the beginning of the 20th century. Its mindfulness and comprehension of difference even when inhabiting a traditional space, is one essential part of the Harlem Renaissance. While he was later eclipsed by other Harlem Renaissance authors such as Langston Hughes and Zora Neale Hurston, Cullen’s work must stand at the heart of the movement.

Archibald Motley, Jr. was another African American man of the early 20th century who occupied two not entirely separate artistic spaces. As an insightful painter of the Harlem Renaissance, he lovingly detailed novel images of African American identity. At the same time, as the scion of a wealthy family, he partook of the classical fine-art tradition he studied at the Art Institute of Chicago. These two identities would both find expression in his subsequent work, though, somewhat similar to Countee Cullen, he himself primarily favored Europe.

The influence of European art on Motley’s productions stemmed both from his early training in Chicago and from his study in Paris on a Guggenheim Fellowship. In Paris, he immersed himself deeply in the European portraits of the Louvre, being especially impressed by the works of Rembrandt. He embraced this *metier* so fully that his portraits have at times been described as Dutch paintings that happen to have Black subjects.

Nevertheless, despite their European style, Motley’s subjects were not only Black, they were strongly tied to the experience of being Black in America. For example, his paintings sought to capture the subtlety of gradations in skin tone, particularly among women of mixed-race descent. This work undermined the traditional view of a fixed, monolithic Blackness, as his figures—which traditional views would lump together under the generic heading “Black”—ran the gamut. His crowd scenes also challenged other traditional views of Blackness: they depicted African American people in an energetic, urban environment, a sharp contrast with the traditional rural scenes to which African Americans were often relegated. In this, Motley, like Cullen, powerfully shaped the artistic expectations embodied in the Harlem Renaissance.

21. It can reasonably be inferred that the primary purpose of this passage is to:

- A. place the Harlem Renaissance in its proper historical context.
- B. condemn mainstream American culture for its lack of appreciation for 20th-century African American artists.
- C. describe the importance of Countee Cullen as an African American author.
- D. introduce readers to one powerful aspect of the Harlem Renaissance, using two representative artists as examples.

22. Countee Cullen is presented by the author as being:
- F. the first successful African American author.
 - G. an educated Black poet who favored European forms and African American content.
 - H. a disgruntled Black author.
 - J. an African American writer who isolated himself from the struggles of his peers.
23. Which of the following best describes the way the third paragraph (lines 24-34) functions in relation to the passage as a whole?
- A. It describes one aspect of the Harlem Renaissance that will be represented in two specific examples.
 - B. It provides an overview of the artistic and cultural scope of the Harlem Renaissance.
 - C. It shows the limitations of the Harlem Renaissance as a purely African American movement.
 - D. It disparages the Harlem Renaissance for its inclusion of European culture.
24. It can be reasonably inferred from the fifth paragraph (lines 44-59) that one of the biggest potential stumbling blocks to Cullen's success was:
- F. a critical backlash against the poetry of Keats and Shelley.
 - G. some critics' acceptance of including traditional religious ideology in contemporary poetry.
 - H. critical resistance to a Harvard-educated Black poet.
 - J. the unwillingness of some critics to see traditional imagery combined with contemporary social problems.
25. Based on the author's discussion of Cullen's influence, it can be reasonably inferred that the author's attitude toward Cullen's writing is one of:
- A. sympathy.
 - B. disdain.
 - C. approval.
 - D. nostalgia.
26. As it is used in line 95, the phrase "ran the gamut" most nearly means:
- F. extended across the entire range.
 - G. included more traditional views.
 - H. behaved in an extreme manner.
 - J. expressed subtlety in art.
27. According to the passage, Archibald Motley's paintings are significant because they:
- A. support the traditional aspect of European artists, while undermining the importance of the Harlem Renaissance movement.
 - B. challenge mainstream views of African Americans while remaining within mainstream artistic tradition.
 - C. prove that African Americans can paint successfully in a European style.
 - D. provide an example to other artists about the importance of formal artistic training.
28. The author ties the Harlem Renaissance to developments in all of the following areas EXCEPT:
- F. immigration.
 - G. literature.
 - H. music.
 - J. politics.
29. The author of the passage describes the Harlem Renaissance movement as:
- I. primarily a literary movement.
 - II. harmful to the African American culture.
 - III. bringing together diverse cultural traditions.
- A. I only
 - B. II only
 - C. I and III only
 - D. I, II, and III
30. It can be reasonably inferred from the passage that Motley's education at the Art Institute of Chicago focused on which of the following areas?
- F. The works of the Harlem Renaissance
 - G. The African American artistic tradition
 - H. The European artistic tradition
 - J. The works of French Impressionists

Passage IV

NATURAL SCIENCE: The following passage is adapted from *Wild and Domestic Sheep in the Berlin Zoological Gardens: Scientific American* © 1898.

As a rule, domestic animals are accorded very little space in modern zoos, but, although it is doubtless the first duty of these popular institutions to show visitors animals which live in a wild state in foreign lands, it is well, where there is sufficient space and adequate means, to extend the limits of the collection so as to include natives of our own woods and fields, thus enabling people of a great city who are unfamiliar with nature to form an idea of the changes wrought in animal life by the influence of man, for domestic animals are a great aid in the study of natural history. The occupants of the new sheep and goat house represent mostly foreign breeds, but there are a few that belong to that South European-Asiatic group which are looked upon as the progenitors of the domestic sheep: the mouflon of Sardinia and Corsica (*Ovis musimon L.*), which has a coat of brownish red, flecked with darker color, and the slender, long-legged, reddish-gray sheep of Belochistan (*Ovis blanfordi hume*).

The first glance at these creatures convinces one that they are wild, not domestic sheep, an impression which is caused chiefly by the monotonous coloring and the dry, short coat, which bears no resemblance to the thick fleece of the tame sheep. However, one's eye is soon attracted by other differences, such as the shape of the tail, which is short and thick, and of the horns, which extend over the back and then turn inward, so that when the old ram is kept in captivity, it is necessary to cut off the points of the horns to prevent their boring into the flesh of its neck. Horns of this shape form a strong contrast to those with snail-like windings and points standing away from the body. When looking at one of these sheep from the front, it will be noticed that the left horn turns to the right and the right horn to the left.

Former authorities have been unwilling to admit that the domestic sheep have come from any species of wild sheep of the present time. These experts hold that the sheep are the descendants of one or more species of wild sheep that are now extinct. Recently, however, men have thought more deeply and freely on such subjects, and Nehring and others have traced the modern tame sheep back to the mouflon, but not to that species alone. It is thought that in this case, as with other domestic animals, there has been a mixture of species, and in this connection attention was directed to the Transcasian arkal, the argalis of the interior of Asia, and the North African species. Dr. Heck, director of the Berlin Zoological Garden, thinks that the horns of the tame ram, which are turned outward, the points being directed away from the body, constitute one of the strongest proofs that the blood of the argalis and its extinct European ancestors—which are known only by the fossil remains—flows in the veins of all domestic sheep.

The other characteristic marks of the domestic sheep—the wool and the length of the tail—vary greatly. The heath sheep—the little, contented, weather-hardened grazing sheep of the Lüneburg and other heaths—belong to one of the oldest species, and their tails are as short and their horns as dark as those of the mouflon. A cross between these two breeds is not distinguishable, even in the second generation, as has been shown by the multitude of interesting experiments in the Düsseldorf Zoological Garden.

31. The primary purpose of the passage is to:
 - A. describe the history and evolution of domestic animals at the Berlin Zoological Garden.
 - B. argue for the usefulness of experimenting on domestic sheep that are kept in zoos.
 - C. analyze some differences and similarities between domestic and wild sheep.
 - D. explain the role of Dr. Heck in the study of domestic sheep, both modern and extinct.
32. According to the passage, some captive sheep must have their horns trimmed because.
 - F. the horns often aid in identifying fossil remains of extinct sheep.
 - G. domestic sheep have horns with points extending away from the body, which is considered dangerous.
 - H. domestic sheep are often kept with wild sheep in the same enclosures.
 - J. the horns continue to grow and can injure the sheep's neck.
33. According to the passage, which of the following are characteristics of mouflon sheep?
 - I. reddish-brown coat
 - II. short tail
 - III. dark horns
 - A. I and II only
 - B. II and III only
 - C. I and III only
 - D. I, II, and III
34. The author uses the information in the third paragraph (lines 34-52) primarily to:
 - F. refute the previously held belief that domestic sheep descended only from extinct wild sheep species.
 - G. prove that the experts were wrong about the origin of the argalis sheep.
 - H. illustrate the importance of the fossil record to the ongoing study of domestic animals, particularly sheep.
 - J. condemn the interference of man in the development of domestic sheep.

35. According to information in the passage, the statement that a heath sheep/mouflon sheep hybrid is not distinguishable from either parent can be considered fact because:
- A. common sense and observations show that the sheep are identical.
 - B. many experiments have been conducted that support the statement.
 - C. Dr. Heck believed the statement was true.
 - D. arguments over its premise would delay further experiments.
36. As it is used in line 9, the word *wrought* means:
- F. influenced.
 - G. studied.
 - H. produced.
 - J. embellished.
37. One can logically infer from lines 1-11 that:
- A. domestic animals are only found in large modern zoos where they can be adequately studied.
 - B. most modern zoos have numerous exhibits featuring popular domestic animals whose evolution has been affected by man.
 - C. people who live in large cities are unfamiliar with all forms of domestic animals, even those found in nearby woods and fields.
 - D. a significant number of people who live in large cities do not often see certain domestic animals outside of zoos.
38. Which of the following statements is NOT supported by the second paragraph (lines 19-33)?
- F. Some sheep have horns that point away from the body.
 - G. Domestic sheep can sometimes be confused with wild sheep.
 - H. All domestic sheep have thick fleece.
 - J. Certain species of wild sheep have a dry, short coat.
39. How can *Ovis musimon L.* and *Ovis blanfordi hume* be compared?
- A. Both are considered ancestors of domestic sheep.
 - B. Both are known only by their fossil remains.
 - C. The first is an old species and the second is a new species.
 - D. The first is found only in zoos and the second is found only in the wild.
40. According to Dr. Heck, the horns of the domestic ram provide evidence that:
- F. domestic sheep are descended only from extinct European sheep.
 - G. domestic sheep are related to certain extant wild sheep species.
 - H. domestic sheep lack any of the characteristics of wild sheep.
 - J. domestic sheep cannot be traced back to any species of extinct wild sheep.

END OF TEST 3

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

DO NOT RETURN TO A PREVIOUS TEST.

SCIENCE TEST

35 Minutes—40 Questions

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

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

Passage I

Cats and humans have coexisted for thousands of years. Because of the close relationship that can develop between cats and humans, humans can sometimes develop cat scratch disease (CSD). It is a bacterial disease caused by the spread of *Bartonella henselae* from a cat to a human via a scratch or bite (traumatic cat contact). About 40% of cats carry *B. henselae* at some point in their lives. These cats do not show any signs of illness, which makes it impossible to determine which cats can spread CSD. While CSD rarely proves fatal, it can result in several painful and potentially dangerous symptoms. Table 1 shows some symptoms and their onset and typical duration.

Table 1		
Symptom	Onset	Typical Duration
Infection at the site of scratch or bite	3-30 days after contact	1-4 weeks
Prolonged fever	5-30 days after contact	1-2 weeks
Swollen lymph nodes	7-30 days after contact	4-8 weeks
Fatigue	7-30 days after contact	3-4 weeks

Clinical diagnosis of CSD can sometimes be difficult. Table 2 lists 4 criteria, 3 of which must be met in order for a patient to be diagnosed with CSD. Most people recover in 2 – 5 months, but it can take up to one year for the swelling in the lymph nodes to disappear completely.

Table 2	
1	history of traumatic cat contact
2	positive skin-test response to CSD skin-test antigens
3	characteristic lymph node lesions
4	negative laboratory investigation for unexplained lymphadenopathy (nodes that are abnormal in either size, consistency, or number)

- On the basis of the data in Table 1, if a person were infected with *B. henselae* after traumatic cat contact, one would predict that symptoms would begin appearing:
 - after 6 weeks.
 - within 30 days.
 - after 1 day.
 - immediately.
- The symptom that develops most quickly is:
 - fatigue.
 - lymph node swelling.
 - prolonged fever.
 - infection.
- Suppose that a patient develops swollen lymph nodes and prolonged fever 40 days after contact. The patient has a history of traumatic cat contact and characteristic lymph node lesions. Should this patient be diagnosed with CSD?
 - Yes, because the patient meets 2 of the 4 criteria listed in Table 2.
 - Yes, because the patient has 2 of the 4 criteria listed in Table 1.
 - No, because the period of onset for the symptoms is outside of the range for CSD.
 - No, because the patient must exhibit all of the symptoms listed in Table 2.

4. Suppose that a patient has a history of traumatic cat contact and lymph node lesions. The patient has been previously diagnosed with abnormally large lymph nodes. Should this patient be diagnosed with CSD?
- F. Yes, because the patient meets 3 of the 4 criteria listed in Table 2.
 - G. Yes, because the patient exhibits at least 1 of the 4 symptoms listed in Table 1.
 - H. No, because the patient only meets 2 of the 4 criteria listed in Table 2.
 - J. No, because the patient must exhibit all of the symptoms listed in Table 1.
5. According to the passage, which symptom requires the longest recovery time?
- A. infection
 - B. prolonged fever
 - C. swollen lymph nodes
 - D. fatigue
6. Which of the following statements about CSD is supported by the information presented in the passage?
- F. CSD, though rarely fatal, can cause pain and discomfort in humans that can last up to one year.
 - G. CSD symptoms generally disappear completely within 2 months of the onset of the disease.
 - H. CSD, a bacterial disease, is typically spread to humans by cats showing signs of illness.
 - J. CSD proves fatal in approximately 40% of cats.

Passage II

The possibility of life on Mars has long been a matter of scientific debate due to the planet’s proximity and similarity to Earth. Recent discoveries have reenergized the debate. Scientists discuss whether the conditions on Mars make life impossible, or if life on Mars is not only possible, but a demonstrated fact.

Scientist 1

Evidence for life on Mars is twofold. First, scientists have discovered signs of possible biological processes in meteorites known to have come from Mars. Second, scientists have discovered possible evidence of a habitable environment (i.e. the possible presence of water) on Mars itself.

Most of the support for biological processes comes from a meteorite sample found in Antarctica in 1984. Studies indicate that the sample was ejected from Mars about 17 million years ago and has spent 11,000 years on Earth. Composition analysis has revealed a kind of mineral that, on Earth, is only found in association with certain microorganisms. Moreover, electron-scanning microscopes detected possible fossil remains of *nanobacteria*, a bacteria-like lifeform only nanometers in length.

In 2000, evidence for water under the surface of Mars was discovered in the form of flood-like gullies. Deep subsurface water deposits near the planet’s liquid core might form a present-day habitat for life. In this environment, Martian life would most likely be found in soil sediments formed in water. Further data is needed to confirm this hypothesis.

Scientist 2

There is no definite proof of life on Mars. The possible microfossils discovered on the Antarctica meteorite are inconclusive at best. The scientific community is not convinced that nanobacteria exist at all, due to the fact that they are too small to contain RNA genetic code. Other meteorites have been hailed as signs of life because they contain evidence of carbon deposits. While carbon is the basis of life, it is also the fourth most common element in the universe. Its presence may suggest life, but it does not prove it.

It is true that scientists have found suggestions of water in the form of flood-like gullies. However, astronomers have also found similar gullies on the Moon, which is believed never to have had liquid water on its surface. I believe that, as on the Moon, the Mars gullies are the result of micrometeorite impacts.

7. Which of the following criticisms might Scientist 1 logically make about Scientist 2’s conclusion that the microfossils are not evidence of life on Mars?
 - A. Scientist 2 ignores the mineral data that reinforces the identification of nanobacteria.
 - B. Scientist 2 does not understand the role of carbon in biology.
 - C. Scientist 2 has misidentified the origin of the meteorites.
 - D. Scientist 2 does not understand the importance of Antarctica in the development of the hypothesis supporting the existence of life on Mars.
8. Scientist 2’s hypothesis would be most strongly supported by the finding that sediment rocks on Mars:
 - F. are 17 million years old.
 - G. contain evidence of nanobacteria.
 - H. contain carbon deposits.
 - J. contain salinity at a level that is toxic to life.
9. If detected, which of the following elements in the nanobacteria found in the Martian meteorite would indicate the presence of organic life similar to that on earth?
 - A. Aluminum
 - B. Boron
 - C. Carbon
 - D. Potassium
10. The discovery of additional remains of nanobacteria on meteorites originating from Mars would support Scientist 1’s theory more than Scientist 2’s theory, provided that which of the following is correct?
 - F. Carbon molecules are found with the microfossils.
 - G. A type of RNA genetic code is found in these microfossils.
 - H. Liquid water is found with the microfossils.
 - J. The meteorite is found on a continent other than Antarctica.
11. Which of the following observations would more strongly support Scientist 1 than Scientist 2?
 - A. Evidence of carbon molecules on Mars.
 - B. Evidence proving that gullies on Mars were created by micrometeorites.
 - C. Evidence showing bacterial remains in Martian soil samples.
 - D. Evidence of sediment in meteorites from Mars found on Earth.



12. Which of the following observations would provide evidence to support Scientist 2's theory but NOT Scientist 1's theory?

- F. The discovery that the Moon once had surface water.
- G. The scientific community's decision to reclassify life forms to include silicon-based organisms in addition to carbon-based organisms.
- H. The discovery of nanobacteria in soil sediments on Mars.
- J. Scientific data proving that nanobacteria cannot reproduce, and are therefore not organic life forms.

13. Which of the following is the weakest link in Scientist 1's argument?

- A. The conclusion that 17 million-year-old fossils could provide evidence that life once existed on Mars.
- B. The conclusion that deep subsurface water deposits might support life.
- C. The conclusion that nanobacteria are too small to contain RNA genetic code.
- D. The suggestion that Mars' proximity to Earth means that Mars might support life.

Passage III

A physics class studied the frictional forces of moving objects. Students performed three experiments using their physics book as the moving object. The book was either wrapped in paper or left unwrapped. To pull the book, students tied a twine around the book and attached it to a spring scale, as shown in Figure 1.

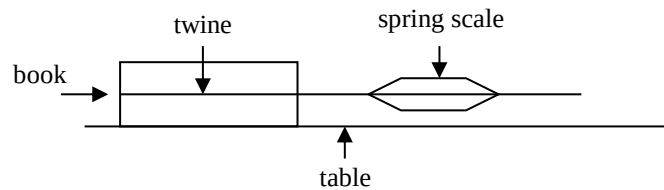


Figure 1

The spring scale measured the amount of force, in newtons (N), required to move the book across the table at a constant speed, which is equal to the amount of frictional force between the book and the tabletop.

(Note: All physics books were pulled at a constant low speed, unless stated otherwise.)

Experiment 1

Four physics books were wrapped in a different type of paper and then pulled across the table. The measured forces are provided in Table 1.

Table 1	
Type of paper	Force (N)
Wrapping paper	5.7
Notebook paper	5.3
Waxed paper	4.9
Newspaper	4.1

Experiment 2

Students pulled an unwrapped physics book across the table. The process was then repeated with 1, 2, 3, or 4 identical unwrapped physics books stacked on top of the first book (see Table 2).

Table 2	
Number of physics books pulled across the table at one time	Force (N)
1	3.4
2	6.9
3	10.2
4	13.7
5	17.0

Experiment 3

A physics book wrapped in wrapping paper was pulled in order for it to move at a medium speed. Then it was pulled in order for the book to move at a high speed (see Table 3).

Table 3	
Speed	Force (N)
Medium	5.7
High	5.7

14. Which of the following ranks the different types of paper used to wrap the physics books in order, from the paper that presented the greatest resistance to sliding, to the paper that presented the least resistance to sliding?
- F. Newspaper, waxed paper, notebook paper, wrapping paper
 - G. Notebook paper, wrapping paper, waxed paper, newspaper
 - H. Wrapping paper, notebook paper, waxed paper, newspaper
 - J. Wrapping paper, waxed paper, newspaper, notebook paper

15. In Experiment 1, students wrapped physics books in different types of paper to vary the amount of frictional force between:
- A. wrapped books and the tabletop.
 - B. stacked books, so that the books would not slide over each other when pulled across the table.
 - C. wrapped books and the twine used to pull.
 - D. types of papers and the books.
16. If Experiment 2 was repeated with a stack of 3.5 unwrapped physics books, the reading on the spring scale would be closest to which of the following?
- F. 8.6 N
 - G. 9.9 N
 - H. 12.1 N
 - J. 14.4 N
17. The students conducted a 4th experiment, in which they took the four wrapped physics books from Experiment 1 and pushed them in such a way that the books slid across the table at similar initial speeds. Based on the results from Experiment 1, the physics book wrapped in which paper would most likely have taken the *longest* amount of time to come to a complete stop?
- A. Wrapping paper
 - B. Notebook paper
 - C. Waxed paper
 - D. Newspaper
18. Based on the results of Experiments 1 and 3, which of the following correctly describes the effect of a book's speed on the amount of frictional force on the physics book?
- F. As speed increased, the amount of frictional force always decreased.
 - G. As speed increased, the amount of frictional force always increased.
 - H. As speed increased, the amount of frictional force increased and then decreased.
 - J. The speed did not affect the amount of frictional force on the physics book.
19. What was the main purpose of Experiment 2?
- A. To determine the relationship between frictional force and the mass of a wrapped physics book.
 - B. To determine the relationship between frictional force and the weight of a stack of physics books.
 - C. To determine the relationship between frictional force and the speed of the moving physics books.
 - D. To determine the relationship between frictional force and the type of paper used to wrap the physics book.
20. Which of the units below is a component of the calculation of force (N) in the experiments?
- F. Foot
 - G. Mol
 - H. Pound
 - J. Second

Passage IV

When two male Syrian hamsters are put in the same cage, there is usually a fight or a threat display. The submissive hamster will retreat to a place of safety if forced to by the dominant hamster. A zoologist conducted two experiments to investigate the formation of *dominance hierarchies* (rankings) in male Syrian hamsters. In the experiments below, five adult male Syrian hamsters were placed together in a cage while the zoologist observed and recorded the interactions.

Experiment 1

The zoologist recorded the sequence in which the hamsters were placed in the cage, their length, their adult ages, and the number of squeaks each hamster made during the experiment. The zoologist also ranked the hamsters according to their aggressiveness toward each other, from least aggressive (1) to most aggressive (5). This data was used to determine the factors that may affect the formation of dominance hierarchies. The results are displayed in Table 1.

Table 1					
Hamster	Sequence	Length (cm)	Adult Age (months)	Number of squeaks	Aggressiveness (rank)
A	1 st	12.5	14	25	3
B	2 nd	15.0	12	30	4
C	3 rd	13.2	18	40	5
D	4 th	17.0	16	22	2
E	5 th	16.2	20	10	1

Experiment 2

The hamsters were placed back in the cage in the same order as in Experiment 1. The aggressive encounters between pairs of hamsters were analyzed and recorded. A “winner” is defined as a hamster that causes the other hamster to retreat. The retreating hamster is label the “loser.” The analysis of the aggressive encounters is shown in Table 2.

Table 2					
Winning Hamster	Number of times hamster lost				
	A	B	C	D	E
A	—	6	0	24	30
B	18	—	18	24	24
C	30	30	—	12	42
D	6	0	0	—	18
E	0	0	0	12	—

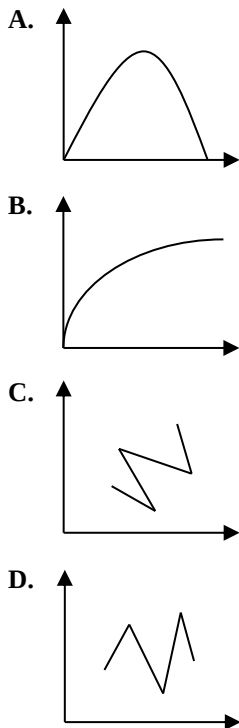
Table 3 displays the results of all encounters for each hamster.

Table 3			
Hamster	Total number of:		
	wins	losses	encounters
A	60	54	114
B	84	36	120
C	114	18	132
D	24	72	96
E	12	114	126

21. If the zoologist was to make a generalization about the relationship between Syrian hamster length and position in the dominance hierarchy, which of the following would be consistent with the results from the experiments?
- The shortest hamster will be the most dominant.
 - The longest hamster will be the most submissive.
 - The longest hamster will be the most dominant.
 - Length has no effect on position in the hierarchy.
22. Research from another source demonstrates that the higher the level of dominance a hamster exhibits, the more food the hamster will obtain. Based on the win-loss records, which hamster would obtain the LEAST amount of food?
- Hamster A
 - Hamster B
 - Hamster D
 - Hamster E
23. A sixth hamster was added to the experimental cage. It was 17 months old and had a length of 16.8 cm. While in the cage, the hamster squeaked 19 times. Using the results from Experiment 1, what would the zoologist rank the sixth hamster in terms of aggressiveness?
- 1
 - 2
 - 3
 - 4
24. Based on Experiments 1 and 2, there is a correlation between the number of squeaks a hamster will make and which of the following factors?
- Age
 - Aggressiveness
 - Length
- I only
 - I and II only
 - II only
 - I, II, and III

25. Using the results from Experiment 2, how many total encounters were there between Hamster B and Hamster C?
- 12
 - 25
 - 35
 - 48
26. Based on Experiments 1 and 2, which of the following statements is true?
- There is a direct relationship between length and aggressiveness rank.
 - There is a direct relationship between length and the number of squeaks.
 - There is an inverse relationship between length and the number of squeaks.
 - There is a direct relationship between the number of squeaks and aggressiveness.
27. If the zoologist were to draw a graph representing the relationship between hamster length and age as an adult, it would look like which of the following graphs?

(Note: The vertical axis is adult age (months) and the horizontal axis is length (centimeters)).



Passage V

Minerals can be identified by different characteristics such as hardness, color, specific gravity (density), and luster. Minerals with a specific gravity less than 2.0 are considered light, those with a specific gravity between 2.0 and 4.5 are considered average in weight, and those with a specific gravity greater than 4.5 are considered heavy.

Table 1 lists minerals according to the Mohs Scale, in order of hardness from soft (1) to hard (10). Luster describes how a mineral reflects light; minerals with a high reflectance are considered shiny, or metallic, while those with a low reflectance are considered dull. Table 2 describes different levels of luster for some minerals. Table 3 lists some common minerals and their identifying characteristics.

Table 1	
Mohs Hardness Scale	Mineral
1	Talc
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Feldspar
7	Quartz
8	Topaz
9	Corundum
10	Diamond

Table 2	
Luster	Description
Metallic (splendent)	Opaque and reflective like metal
Submetallic	Opaque to nearly opaque and reflects well; thin splinters are translucent
Vitreous (glassy)	Reflective like glass
Adamantine (brilliant)	Transparent to translucent; extraordinarily brilliant and shiny
Resinous	Appears honey-like but not necessarily the same color
Silky	Fine fibrous structure, similar to silk cloth
Pearly	Like a shirt button or inside of mollusk shell; usually iridescent (rainbow-like)
Greasy (oily)	Appears coated with grease or oil
Pitchy	Tar-like; usually radioactive
Waxy	Appears coated with wax
Dull (earthly)	Poor reflective qualities; porous or rough

Table 3				
Mineral	Color	Luster	Hardness	Specific Gravity
Gypsum	Colorless, white, gray, brown, beige, orange, pink, yellow, light red, green	Vitreous to pearly	1.5-2	2.3–2.4
Halite	Colorless, white, red, yellow, orange, pink, green, blue, violet, gray	Vitreous	2-2.5	2.6
Calcite	All colors; may be multicolored	Vitreous	3	2.7
Anhydrite	Colorless, white, light yellow, gray, blue, orange-red, red, pink, lilac	Vitreous to pearly	3-3.5	2.9–3.0
Chalcopyrite	Brass yellow to golden yellow	Metallic	3.5-4	4.1–4.3
Pyrite	Yellowish gray to gray	Metallic	6-6.5	4.9–5.2

28. According to the passage, which of the following minerals listed in Table 1 most likely has the lowest specific gravity?

F. Quartz

G. Diamond

H. Talc

J. Topaz

29. A mineral has been located that is blue, reflective like glass, and registers 3 on the Mohs Scale. This mineral is most likely:

A. Apatite.

B. Pyrite.

C. Fluorite.

D. Calcite.

30. If a contractor is working on a project which requires cutting through apatite, it would be best to tip his drill bits with which of the following materials?

F. Calcite

G. Feldspar

H. Fluorite

J. Gypsum

31. According to the passage, which of the following pairs of minerals is most similar?

A. Calcite and topaz

B. Halite and anhydrite

C. Talc and diamond

D. Feldspar and gypsum

32. According to Table 3, as a mineral’s hardness increases, its specific gravity:

F. increases only.

G. decreases only.

H. increases, then decreases.

J. decreases, then increases.

33. If a geologist is analyzing the material with the highest possible rating on the Mohs Hardness Scale, which element would he or she expect to find in that material?

A. Carbon

B. Hydrogen

C. Iron

D. Silicon

Passage VI

Bees are attracted to the nectar of flowers. The bees collect the nectar and carry it back to their hives. During the collection process, pollen gets caught on the bees’ legs and is deposited on other flowers. This is how bees help with cross-pollination. After returning to the hive, the worker bees use the nectar to make honey. Different flowers produce different types and quantities of nectar. Three studies were conducted to examine the process of nectar collection by honeybees.

Study 1

Two different plant species were made available to two honeybee hives in the area. Species A was placed near the first hive only. Species B was placed near the second hive only. The color of the hive’s honey and quantity of honey produced (in cups) was examined, measured, and recorded over 6 weeks.

Table 1		
Species	Color of Honey	Quantity of Honey (cups)
A	Light	8
B	Dark	12

Study 2

Three study sites were established to determine the rate at which the honeybees collect nectar from each of the plant species in Study 1. At Site 1, species A plants were absent. At Site 2, species B plants were absent. At Site 3, both species A and B were absent. When the plant was not available, 1 dish of pure nectar was made available instead.

Once a bee collected the nectar from a plant, the plant was removed from the site. This procedure was repeated over a 24-hour period. The quantity of nectar collected by the bees was calculated and recorded in Table 2.

Table 2				
Quantity of Nectar Collected (ounces)				
Site	Absent Plant Species	A	B	Dish
1	A	0	2	3
2	B	2	0	2
3	A & B	0	0	8

Study 3

The researchers brought in African honey bees to examine the effectiveness of their nectar collection techniques in relation to cross-pollination. They also observed the local honeybees in another area away from the African honeybees. The plants in the areas were watched for the next 2 years and their population levels were recorded in Table 3.

Table 3		
Maturation of Plants in Area	Regular Honey Bee	African Honey Bee
Plants alive after 1 year	12	35
Plants alive after 2 years	8	22
Quantity of honey produced (cups)	112	237
New plants from cross-pollination	2	7

34. Which of the following variables was controlled in the design of Study 2?
- F. Number of nectar dishes made available at each site.

G. Number of bees present at each site.

H. Quantity of honey produced at each site.

J. Quantity of nectar made available at each site.
35. According to the results of Study 1 and Study 2, Species A and Species B are most similar in that the:
- A. color of the honey produced was the same for both plant species.

B. quantity of nectar collected from one plant species when the other plant species was absent is the same.

C. number of bees pollinating each plant was the same for both species.

D. cross-pollination was the same for both bee species.

36. In Study 2, Site 3 was used to study the:
- F. effects of having both Species A and B available to the bees.
 - G. effects of having only Species A plant available to the bees.
 - H. effects of having only Species B plant available to the bees.
 - J. effects of having only nectar dishes available to the bees.
37. Which of the following could be considered a weakness in the design of Study 2?
- A. The nectar could have been eaten by other animals in the forest.
 - B. The dishes could have been taken by other animals in the forest.
 - C. Some plants were not present at each site.
 - D. Some bees were not present at each site.
38. The results of Study 2 suggest which of the following factors most affects the type of nectar preferred by honeybees?
- F. Color of the honey
 - G. Easy access and retrieval of nectar
 - H. Type of nectar in the area
 - J. Number of plants in the area
39. Based on the results of Study 3, one could generalize that compared to the cross-pollination of the regular honey bee, the African honey bee:
- A. is much more effective and efficient.
 - B. is much less effective and efficient.
 - C. is about the same in effectiveness and efficiency.
 - D. produced no measurable results.
40. If true, which of the following facts would strengthen the conclusion suggested by the results of Study 3?
- F. The African honeybees were located in an area which caused them to experience fewer natural predators than the regular honeybees.
 - G. The African honeybees were located in an area which caused them to experience a greater number of natural predators than the regular honeybees.
 - H. The African honeybees were located in an area with plants that naturally produce more nectar than those in the area of the regular honeybees.
 - J. The nectar collection technique of African honeybees is unable to produce new plants from cross-pollination.

WRITING TEST

40 Minutes—1 Prompt

Genetically Modified Food

An increasing amount of the food brought to market is less the result of environmental processes, and more the result of genetic engineering that occurs in labs around the world. Whereas the sun and other natural phenomena once solely dictated the content of food on the market, now the composition of food is also determined by scientists in white coats working in labs. Due to this engineering at the molecular level, we can now create a larger quantity of food which has a nutritional content surpassing that of food of the past. This development is often seen as beneficial, but what are the potential risks of humans involving themselves in natural processes, especially when food is what we are manipulating? Given the increasing presence of genetically modified food, it is worth examining its potential implications and the meaning of its existence in our lives.

Read and carefully consider these perspectives. Each suggests a particular way of thinking about the increasing presence of genetically modified foods on the market.

Perspective One

What we introduce when genetically modifying food is humanity's own imperfections. Machines built by humans regularly break or are later found to be more dangerous than anticipated. Do we really want that risk associated with our food?

Perspective Two

Technology is good at modifying the genes of plants and animals to create food of increased nutrition and extremely high yields. This increase in quantity and quality will lead to potentially revolutionary outcomes.

Perspective Three

Genetically modified food undermines our traditional notions about the limits of what food is or can be. This is beneficial because it forces humans towards new understandings about how we can feed the world.

Essay Task

Write a unified, coherent essay about the increasing presence of genetically modified foods. In your essay, be sure to:

- clearly state your own perspective on the issue and analyze the relationship between your perspective and at least one other perspective
- develop and support your ideas with reasoning and examples
- organize your ideas clearly and logically
- communicate your ideas effectively in standard written English

Your perspective may be in full agreement with any of those given, in partial agreement, or completely different.

WRITING TEST

40 Minutes—1 Prompt

Planning Your Essay

Your work on these prewriting pages will not be scored.

Use the space below and on the back cover to generate ideas and plan your essay. You may wish to consider the following as you think critically about the task:

Strengths and weaknesses of the three given perspectives

- What insights do they offer, and what do they fail to consider?
- Why might they be persuasive to others, or why might they fail to persuade?

Your own knowledge, experience, and values

- What is your perspective on this issue, and what are its strengths and weaknesses?
- How will you support your perspective in your essay?

If you need more space, please continue onto the next page

Use this page to *plan* your essay.
Your work on this page will *not* be scored.

