

ACT

Practice Test 1

HOW TO TAKE THIS PRACTICE TEST

Practice Test 1 is a Kaplan-created test, similar to the actual ACT test booklet. Before taking this practice test, find a quiet room where you can work uninterrupted for three hours. Make sure you have a comfortable desk, your calculator, and several No. 2 pencils.

Use the answer sheet provided to record your answers.

Although you can use your iQuest handheld to score your test, wait until you've completed the test before transferring answers into your iQuest handheld. Do *not* waste your time during the test inputting answers into the iQuest handheld.

Once you start this practice test, don't stop until you've finished a section. Remember to review your answers for questions in each section.

You'll find explanations following the test.

Test Mode on your iQuest handheld will simulate the real ACT testing environment. The iQuest handheld acts as a test proctor, timing your test, giving you warnings as time is running out, and providing appropriate audio instructions. Once the test ends, you can use the iQuest handheld to easily get your score.

To start the timer on the iQuest handheld, follow these instructions:

1. *Select ACT > Test Mode > Test Timer*
2. Select the Practice Test number that corresponds with this test.
3. Select the sections that you plan to take during this sitting and press the Enter button. The prompts on the iQuest handheld will take you through the rest!

The instructions in the back of the Answers and Explanations to Practice Test 1 explain how to use the iQuest handheld to score your test.

Copyright © 2002 by Kaplan, Inc.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the written permission of the Publisher, except where permitted by law.

Kaplan® is a registered trademark of Kaplan, Inc.

ACT Practice Test 1

Answer Sheet

ENGLISH TEST

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

MATH TEST

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

READING TEST

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

SCIENCE TEST

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

ENGLISH TEST

45 Minutes—75 Questions

Directions: In the following five passages, certain words and phrases have been underlined and numbered. You will find alternatives for each underlined portion in the right-hand column. Select the one that best expresses the idea, that makes the statement acceptable in standard written English, or that is phrased most consistently with the style and tone of the entire passage. If you feel that the original version is best, select “NO CHANGE.” You will also find questions asking about a section of the passage or about the

entire passage. For these questions, decide which choice gives the most appropriate response to the given question. For each question in the test, select the best choice, and fill in the corresponding space on the answer folder. You may wish to read each passage through before you begin to answer the questions associated with it. Most answers cannot be determined without reading several sentences around the phrases in question. Make sure to read far enough ahead each time you choose an alternative.

Passage I

[1]

Since primitive times, societies have created, and

1

told legends. Even before the development of written

1

language, cultures would orally pass down these popular

stories. [2] These stories served the dual purpose of

entertaining audiences and of transmitting values and

beliefs from generation to generation.

Indeed today we have many more permanent ways of

3

handing down our beliefs to future generations, we continue

to create and tell legends. In our technological society, a new

form of folk tales has emerged: the urban legend.

4

1. A. NO CHANGE
B. created then subsequently told
C. created and told
D. created, and told original
2. Suppose that the author wants to insert a sentence here to describe the different kinds of oral stories told by these societies. Which of the following sentences would best serve that purpose?
F. These myths and tales varied in substance, from the humorous to the heroic.
G. These myths and tales were often recited by paid storytellers.
H. Unfortunately, no recording of the original myths and tales exists.
J. Sometimes it took several evenings for the full story to be recited.
3. A. NO CHANGE
B. However,
C. Indeed,
D. Although
4. F. NO CHANGE
G. it is called the
H. it being the
J. known as the

GO ON TO THE NEXT PAGE ➡

[2]

Urban legends are stories we all have heard; they are supposed to have really happened, but are never verifiable
5
however. It seems that the people involved can never be
5
found. Researchers of the urban legend call the elusive participant in such supposed “real-life” events a FOAF—a Friend of a Friend.

[3]

Urban legends have some characteristic features. They are often humorous in nature with a surprise ending and a
6
conclusion. One such legend is the tale of the hunter who
6
was returning home from an unsuccessful hunting trip. On his way home, he accidentally hit and killed a deer on a deserted highway. Even though he knew it was illegal, he decided to keep the deer, and he loads it in the back of his
7
station wagon. As the hunter continued driving, the deer, he
8
was only temporarily knocked unconscious by the car, woke
8
up and began thrashing around. The hunter panicked, stopped the car, ran to the ditch, and watched the enraged deer destroy his car.

5. A. NO CHANGE
B. verifiable, however.
C. verifiable, furthermore.
D. verifiable.
6. F. NO CHANGE
G. ending.
H. ending, which is a conclusion.
J. ending or conclusion.
7. A. NO CHANGE
B. loaded it in
C. is loading it in
D. had loaded it in
8. F. NO CHANGE
G. which being
H. that is
J. which was

GO ON TO THE NEXT PAGE ➡

[4]

One legend involves alligators in the sewer systems of major metropolitan areas. According to the story, before alligators were a protected species, people vacationing in Florida purchased baby alligators to take home as souvenirs.

9. A. NO CHANGE
B. species; people
C. species. People
D. species people

Between 1930 and 1940, nearly a million alligators in Florida were killed for the value of their skin, used to make expensive leather products such as boots and wallets. After the novelty of having a pet alligator wore off, many people flushed their baby souvenirs down toilets. Legend has it that the baby alligators found a perfect growing and breeding environment in city sewer systems, where they thrive to this day on the ample supply of rats.

10. F. NO CHANGE
G. Because their skin is used to make expensive leather products such as boots and wallets, nearly a million alligators in Florida were killed between 1930 and 1940.
H. Killed between 1930 and 1940, the skin of nearly a million alligators from Florida was used to make expensive leather products such as boots and wallets.
J. OMIT the underlined portion.

[5]

In addition to urban legends that are told from friend to friend, a growing number of urban legends are passed along through the Internet and e-mail. One of the more popular stories are about a woman who was unwittingly charged \$100 for a cookie recipe she requested at an upscale restaurant. To get her money's worth, this woman supposed copied the recipe for the delicious cookies and forwarded it via e-mail to everyone she knew.

11. A. NO CHANGE
B. would be about
C. is about
D. is dealing with
12. F. NO CHANGE
G. woman supposedly
H. women supposedly
J. women supposed to

GO ON TO THE NEXT PAGE ➡

[6]

Although today's technology enhances our ability to tell

and retell urban legends, the Internet can also serve as a

monitor of urban legends. Dedicated to commonly told

13

urban legends, research is done by many websites.

13

According to those websites, most legends, including the

ones told here, have no basis in reality.

13. A. NO CHANGE

B. Many websites are dedicated to researching the validity of commonly told urban legends.

C. Researching the validity of commonly told urban legends, many websites are dedicated.

D. OMIT the underlined portion.

Items 14 and 15 ask about the passage as a whole.

14. The author wants to insert the following sentence:

Other urban legends seem to be designed to instill fear.

What would be the most logical placement for this sentence?

F. After the last sentence of Paragraph 2

G. After the second sentence of Paragraph 3

H. Before the first sentence of Paragraph 4

J. After the last sentence of Paragraph 4

15. Suppose that the author had been assigned to write an essay comparing the purposes and topics of myths and legends in primitive societies and in our modern society. Would this essay fulfill that assignment?

A. Yes, because the essay describes myths and legends from primitive societies and modern society.

B. Yes, because the essay provides explanations of possible purposes and topics for myths and legends from primitive societies and modern society.

C. No, because the essay does not provide enough information about the topics of the myths and legends in primitive societies to make a valid comparison.

D. No, because the essay doesn't provide any information on the myths and legends of primitive societies.

GO ON TO THE NEXT PAGE ➡

Passage II

What does it mean to be successful? Do one measure
16

success by money? If I told you about a man: working as a
17
teacher, a land surveyor, and a factory worker (never
holding

any of these jobs for more than a few years), would that man

sound like a success to you? If I told you that he spent two
18
solitary years living alone in a small cabin that he built for
18

himself, and that he spent those years looking at plants and

writing in a diary—would you think of him as a celebrity or

an important figure? What if I told you that he rarely
19
ventured far from the town where he was born, that he was
19

thrown in jail for refusing to pay his taxes, and that he died

at the age of forty-five? Do any of these facts seem to point

to a man whose life should be studied and emulated?

You may already know about this man. You may even
have read some of his writings. His name was: Henry David
20
Thoreau, and he was, in addition to the jobs listed above, a

poet, an essayist, a naturalist, and a social critic. Although

the facts listed about him may not seem to add up to much,

he was, in fact a tremendously influential person. Along
21

with writers such as Ralph Waldo Emerson, Mark Twain,

and Walt Whitman, Thoreau helped to create the first

literature and philosophy that most people identify of as

unique “American.”
22

16. F. NO CHANGE
G. Does we
H. Does one
J. Did you

17. A. NO CHANGE
B. man who worked
C. man and worked
D. man, which working

18. F. NO CHANGE
G. two years living alone
H. two solitary years all by himself
J. a couple of lonely years living in solitude

19. A. NO CHANGE
B. he ventured rarely
C. he has rare ventures
D. this person was to venture rarely

20. F. NO CHANGE
G. was Henry David Thoreau and he
H. was: Henry David Thoreau, who
J. was Henry David Thoreau, and he

21. A. NO CHANGE
B. was, in fact, a
C. was in fact a
D. was in fact, a

22. F. NO CHANGE
G. uniquely
H. uniqueness
J. the most unique

GO ON TO THE NEXT PAGE ➡

In 1845, Thoreau built a cabin. Near Walden Pond and
23
remained there for more than two years, living alone,
fending for himself, and observing the nature around him.

He kept scrupulous notes in his diary, notes that he later
distilled into his most famous work titled *Walden*. Walden is
24
read by many literature students today. [1] To protest
24
slavery, Thoreau refused to pay his taxes in 1846. [2]

Thoreau was a firm believer in the abolition of slavery, and
he objected to the practice's extension into the new
territories of the West. [3] For this act of rebellion, he was
thrown in the Concord jail. [25]

Thoreau used his writing to spread his message of
resistance and activism; he published an essay entitled *Civil*
26
Disobedience (also known as *Resistance to Civil*
Government). In it, Thoreau laid out his argument for
refusing to obey unjust laws.

Although Thoreau's life was very brief, his works and
27
his ideas continue to touch and influence people. Students
all over the country—all over the world—continue to read
his essays and hear his unique voice, urging them to lead
lives of principle, individuality, and freedom. [28]

To be able to live out the ideas that burn in the heart of a
29
person—surely that is the meaning of success.
29

23. A. NO CHANGE
B. cabin. On
C. cabin, by
D. cabin near
24. F. NO CHANGE
G. This book is read by many literature students today.
H. Today, many literature students read *Walden*.
J. OMIT the underlined portion.
25. What is the most logical order of sentences in this paragraph?
A. NO CHANGE
B. 3, 2, 1
C. 2, 1, 3
D. 3, 1, 2
26. F. NO CHANGE
G. activism and he published
H. activism; which is why he published
J. activism to publish
27. A. NO CHANGE
B. he's
C. their
D. those
28. The purpose of this paragraph is to:
F. explain why Thoreau was put in jail.
G. prove a point about people's conception of success.
H. suggest that Thoreau may be misunderstood.
J. discuss Thoreau's importance in today's world.
29. A. NO CHANGE
B. one's heart
C. the heart and soul of a person
D. through the heart of a person

GO ON TO THE NEXT PAGE ➡

Question 30 asks about the preceding passage as a whole.

30. By including questions throughout the entire first paragraph, the author allows the reader to:
- F. answer each question as the passage proceeds.
 - G. think about the meaning of “success.”
 - H. assess the quality of Thoreau’s work.
 - J. form an opinion about greed in modern society.

Passage III

[1]

More than half of the world’s currently living plant and
 31
 animal species live in tropical rainforests. Four square miles
 of a Central American rainforest can be home to up to 1,500
 different species of flowering plants, 700 species of trees,
 400 species of birds, and 125 species of mammals. Of these
 mammals, the sloth is one of the most unusual.

[2]

Unlike most mammals, the sloth is usually upside
 down. A sloth does just about everything upside down,
 including sleeping, eating, mating, and giving birth. Its’
 32
unique anatomy allows the sloth to spend most of its time
 32
 hanging from one tree branch or another, high in the canopy
 of a rainforest tree. About the size of a large domestic cat,
 33
the sloth hangs from its unusually long limbs and long hook-
 33
 like claws. Specially designed for limbs, the sloth’s muscles
 34
seem to cling to things.
 34

31. A. NO CHANGE
 B. currently existing plant
 C. living plant
 D. plant

32. F. NO CHANGE
 G. It’s unique
 H. Its unique
 J. Its uniquely

33. A. NO CHANGE
 B. cat; the
 C. cat. The
 D. cat, but the

34. F. NO CHANGE
 G. The sloth’s muscles seem to cling to things for specially designed limbs.
 H. The muscles in a sloth’s limbs seem to be specially designed for clinging to things.
 J. OMIT the underlined portion.

GO ON TO THE NEXT PAGE ➡

[3]

In fact, a sloth's limbs are so specific adapted to upside-
35
down life that a sloth is essentially incapable of walking on

the ground. Instead, they must crawl or drag itself with its
36
massive claws. This makes it easy to see why the sloth rarely
leaves its home in the trees. Because it cannot move swiftly
37
on the ground, the sloth is an excellent swimmer.

[4]

38 A sloth can hang upside down and, without moving

the rest of its body turn its face 180 degrees so that it
39

was looking at the ground. A sloth can rotate its forelimbs
40
in all directions, so it can easily reach the leaves that make
up its diet. The sloth can also roll itself up into a ball in

order to protect and defend itself from predators.
41

The howler monkey, another inhabitant of the rainforest, is
42
not as flexible as the sloth.
42

35. A. NO CHANGE
B. so specific and
C. so specified
D. so specifically

36. F. NO CHANGE
G. Instead, it
H. However, they
J. In addition, it

37. A. NO CHANGE
B. Despite
C. Similarly,
D. Though

38. The author wants to insert a sentence here to help connect Paragraph 3 and Paragraph 4. Which of the following sentences would best serve that purpose?
F. Of course, many other animals are also excellent swimmers.
G. Another unique characteristic of the sloth is its flexibility.
H. In addition to swimming, the sloth is an incredible climber.
J. Flexibility is a trait that helps the sloth survive.

39. A. NO CHANGE
B. body turns
C. body, it has the capability of turning
D. body, turn

40. F. NO CHANGE
G. had been looking
H. will have the ability to be looking
J. can look

41. A. NO CHANGE
B. protect, and defend itself
C. protects itself
D. protect itself

42. F. NO CHANGE
G. Another inhabitant of the rainforest, the howler monkey, is not as flexible as the sloth.
H. Not as flexible as the sloth is the howler monkey, another inhabitant of the rainforest.
J. OMIT the underlined portion.

GO ON TO THE NEXT PAGE ➡

[5]

The best defense a sloth has from predators such as jaguars and large snakes, though, is its camouflage. During the rainy season, a sloth's thick brown or gray fur is usually covered with a coat of blue-green algae. Which helps it
43
blend in with its forest surroundings. Another type of camouflage is the sloth's incredibly slow movement: it often moves less than 100 feet during a 24-hour period.

[6]

It is this slow movement that earned the sloth its name. *Sloth* is also a word for laziness or an aversion to work. But even though it sleeps an average of 15 hours a day, the sloth isn't necessarily lazy. It just moves, upside down, at its own slow pace through its world of rainforest trees. 44

43. A. NO CHANGE
B. algae, which
C. algae, being that it
D. algae

44. The author is considering deleting the last sentence of Paragraph 6. This change would:
E. diminish the amount of information provided about the habits of the sloth.
G. make the ending of the passage more abrupt.
H. emphasize the slothful nature of the sloth.
J. make the tone of the essay more consistent.

Question 45 asks about the proceeding passage as a whole.

45. The author wants to insert the following description:
An observer could easily be tricked into thinking that a sloth was just a pile of decaying leaves.
What would be the most appropriate placement for this sentence?
A. After the last sentence of Paragraph 1
B. After the third sentence of Paragraph 2
C. Before the last sentence of Paragraph 5
D. Before the first sentence of Paragraph 6

GO ON TO THE NEXT PAGE ➡

Passage IV

During the summer of 1988, I watched Yellowstone

National Park go up in flames. In June, fires ignited by
46
lightning had been allowed to burn unsuppressed because
46
park officials expected that the usual summer rains would

douse the flames. However, the rains never will have come.
47

A plentiful fuel supply of fallen logs and pine needles was
available, and winds of up to 100 mph whipped the
spreading fires along and carried red-hot embers to other
areas, creating new fires. By the time park officials

succumbed to the pressure of public opinion and decide to
48

try to extinguish the flames. It's too late. The situation
49
remained out of control in spite of the efforts of 9,000 fire
fighters who were using state-of-the-art equipment. By

September, more than 720,000 acres of Yellowstone had

been affected by fire. Nature was only able to curb the
50
destruction; the smoke did not begin to clear until the first
50
snow arrived on September 11.

46. F. NO CHANGE
G. fires having been ignited by lightning
H. fires, the kind ignited by lightning,
J. fires ignited and started by lightning

47. A. NO CHANGE
B. came
C. were coming
D. have come

48. F. NO CHANGE
G. are deciding
H. decided
J. OMIT the underlined portion.

49. A. NO CHANGE
B. flames, it's
C. flames, it was
D. flames; it was

50. F. NO CHANGE
G. Only curbing the destruction by able nature
H. Only nature was able to curb the destruction
J. Nature was able to curb only the destruction

GO ON TO THE NEXT PAGE ➡

Being that I was an ecologist who has studied forests
51

for 20 years, I knew that this was not nearly the tragedy it
seemed to be. Large fires are, after all, necessary in order

51. A. NO CHANGE
B. Being that I am
C. I'm
D. As

that the continued health in the forest ecosystem be
52

maintained. Fires thin out overcrowded areas and allow the
53
sun to reach species of plants stunted by shade. Ash fertilizes
the soil, and fire smoke kills forest bacteria. In the case of

52. F. NO CHANGE
G. for the continued health of the forest ecosystem to be maintained.
H. in order to continue the maintenance of the health of the forest ecosystem.
J. for the continued health of the forest ecosystem.

the lodgepole pine, fire is essential to reproduction: the

piners' cone open only when exposed to temperatures greater
53
than 112 degrees.

53. A. NO CHANGE
B. pines cones'
C. pine's cones
D. pine's cone

The fires in Yellowstone did result in some loss of
wildlife, but overall, the region's animals proved to be fire-
tolerant and fire-adaptive. However, large animals such as
54
bison were often seen grazing, and bedding down in
55
meadows near burning forests. Also, the fire posed little
threat to the members of any endangered animal species in
the park.

54. F. NO CHANGE
G. Clearly,
H. In fact,
J. Instead,

55. A. NO CHANGE
B. grazing; and bedding
C. grazing: and bedding
D. grazing and bedding

My confidence in the natural resilience of the forest has
been borne out in the years since the fires ravaged
Yellowstone. Judged from recent pictures of the park the
56

56. F. NO CHANGE
G. Judged by the recently taken pictures of the park
H. Judging from recent pictures of the park,
J. Judging recently from park pictures taken

forest was not destroyed; it was rejuvenated.
57

57. A. NO CHANGE
B. they
C. the fires
D. I

GO ON TO THE NEXT PAGE ➡

Items 58 and 59 pose questions about the passage as a whole.

58. The writer is considering inserting the following true statement after the first sentence of the second paragraph:
- Many more acres of forest burned in Alaska in 1988 than in Yellowstone Park.
- Would this addition be appropriate for the essay?
- F. Yes, the statement would add important information about the effects of large-scale forest fires.
- G. Yes, the statement would provide an informative contrast to the Yellowstone fire.
- H. No, the statement would not provide any additional information about the effect of the 1988 fire in Yellowstone.
- J. No, the statement would undermine the author's position as an authority on the subject of forest fires.
59. Suppose that the writer wishes to provide additional support for the claim that the fire posed little threat to the members of any endangered animal species in the park. Which of the following additions would be most effective?
- A. A list of the endangered animals known to inhabit the park
- B. A discussion of the particular vulnerability of endangered species of birds to forest fires
- C. An explanation of the relative infrequency of such an extensive series of forest fires
- D. A summary of reports of biologists who monitored the activity of endangered species in the park during the fire

Passage V

[1]

White water rafting being a favorite pastime of mine for
60
several years. I have drifted down many challenging North
American rivers, including the Snake, the Green, and the
Salmon, and there are many other rivers in America as well.
61
I have spent some of my best moments in dangerous rapids,
yet nothing has matched the thrill I experienced facing my
first rapids, on the Deschutes River.
62

[2]

My father and I spent the morning floating down a calm
and peaceful stretch of the Deschutes in his wooden
MacKenzie river boat. This trip it being the wooden boat's
63
first time down rapids, as well as mine. Rapids are rated
64
according to a uniform scale of relative difficulty.
64

60. F. NO CHANGE
G. have been
H. has been
J. was
61. A. NO CHANGE
B. have not encountered.
C. Salmon; many other rivers exist in North America.
D. Salmon.
62. F. NO CHANGE
G. rapids: on Deschutes River.
H. rapids; on the Deschutes River.
J. rapids on the Deschutes River.
63. A. NO CHANGE
B. it happened that it was
C. was
D. being
64. F. NO CHANGE
G. Rated according to a uniform scale, rapids are relatively difficult.
H. (Rapids are rated according to a uniform scale of relative difficulty.)
J. OMIT the underlined portion.

GO ON TO THE NEXT PAGE ➡

[3]

Roaring, I was in the boat approaching Whitehorse

65

Rapids. I felt much like a novice skier peering down her first

steep slope: I was scared, but even more excited. The water

churned and covering me with a refreshing spray. My father,

66

towards the stern, controlled the oars. The carefree

expression he usually wore on the river had been replaced

and instead he adopted a look of intense concentration as he

67

maneuvered around boulders dotting our path. To release

tension, we began to holler like kids on a roller coaster, our

voices echoing across the water as we lurched violently

68

about.

[4]

Suddenly we came to a jarring halt and we stopped; the

69

left side of the bow was wedged on a large rock. A whirlpool

whirled around us; if we capsized we would be sucked into

the undertow. Instinctively, I threw all of my weight towards

the right side of the tilting boat. Luckily, it was just enough

70

force to dislodge us, and we continued on down for about

ten more minutes of spectacular rapids.

65. A. NO CHANGE

B. It roared, and the boat and I approached Whitehorse Rapids.

C. While the roaring boat was approaching Whitehorse Rapids, I could hear the water.

D. I could hear the water roar as we approached Whitehorse Rapids.

66. F. NO CHANGE

G. churned, and covering me

H. churning and covering me

J. churned, covering me

67. A. NO CHANGE

B. with

C. by another countenance altogether:

D. instead with some other expression;

68. F. NO CHANGE

G. throughout

H. around

J. from

69. A. NO CHANGE

B. which stopped us

C. and stopped

D. OMIT the underlined portion.

70. F. NO CHANGE

G. it's

H. it is

J. its

GO ON TO THE NEXT PAGE ➡

[5]

Later that day we went through Buckskin Mary Rapids

and Boxcar Rapids. When we pulled up on the bank that

evening, we saw that the boat had received its first scar: that

71

scar was a small hole on the upper bow from the boulder we

71

had wrestled with. In the years to come, we went down

many rapids and the boat receiving many bruises, but

72

Whitehorse is the most memorable rapids of all. [73]

Items 74 and 75 pose questions about the passage as a whole.

74. The writer has been assigned to write an essay that focuses on the techniques of white water rafting. Would this essay meet the requirements of that assignment?

- F. No, because the essay's main focus is on a particular experience, not on techniques.
- G. No, because the essay mostly deals with the relationship between father and daughter.
- H. Yes, because specific rafting techniques are the essay's main focus.
- J. Yes, because it presents a dramatic story of a day of white water rafting.

71. A. NO CHANGE

- B. that was a
- C. which was a
- D. a

72. F. NO CHANGE

- G. received many
- H. received much
- J. receives many

73. Which of the following concluding sentences would most effectively emphasize the final point made in this paragraph while retaining the style and tone of the narrative as a whole?

- A. The brutal calamities that it presented the unwary rafter were more than offset by its beguiling excitement.
- B. Perhaps it is true that your first close encounter with white water is your most intense.
- C. Or, if not the most memorable, then at least a very memorable one!
- D. Call me whacky or weird if you want, but white water rafting is the sport for me.

75. Suppose that the writer wants to add the following sentence to the essay:

It was such a peaceful summer day that it was hard to believe dangerous rapids awaited us downstream. What would be the most logical placement of this sentence?

- A. After the last sentence of Paragraph 1
- B. After the last sentence of Paragraph 2
- C. Before the first sentence of Paragraph 4
- D. After the last sentence of Paragraph 4

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON

STOP

MATHEMATICS TEST**60 Minutes—60 Questions**

Directions: Solve each of the following problems, select the correct answer, and then fill in the corresponding space on your answer sheet.

Don't linger over problems that are too time-consuming. Do as many as you can, then come back to the others in the time you have remaining.

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

1. Illustrative figures are *not* necessarily drawn to scale.
2. All geometric figures lie in a plane.
3. The term *line* indicates a straight line.
4. The term *average* indicates arithmetic mean.

DO YOUR FIGURING HERE.

1. In a recent survey, 14 people found their mayor to be "very competent." This number is exactly 20% of the people surveyed. How many people were surveyed?

- A. 28
B. 35
C. 56
D. 70
E. 84

2. A train traveled at a rate of 90 miles per hour for x hours and then at a rate of 60 miles per hour for y hours. Which expression represents the train's average rate in miles per hour for the entire distance traveled?

- F. $\frac{540}{xy}$
G. $\frac{90}{x} \times \frac{60}{y}$
H. $\frac{90}{x} + \frac{60}{y}$
J. $\frac{90x + 60y}{x + y}$
K. $\frac{150}{x + y}$

3. In a certain string ensemble, the ratio of men to women is 5:3. If there are a total of 24 people in the ensemble, how many women are there?

- A. 12
B. 11
C. 10
D. 9
E. 8

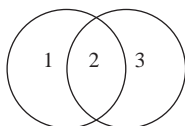
GO ON TO THE NEXT PAGE ➡

4. If $x \neq 0$, and $x^2 - 3x = 6x$, then $x =$?

F. -9
G. -3
H. $\sqrt{3}$
J. 3
K. 9

DO YOUR FIGURING HERE.

5. The two overlapping circles below form three non-overlapping regions, as shown:



What is the maximum number of nonoverlapping regions that can be formed by three overlapping circles?

- A. 5
B. 6
C. 7
D. 8
E. 9
6. If $x^2 + 6x + 8 = 4 + 10x$, then x equals which of the following?
- F. -2
G. -1
H. 0
J. 1
K. 2

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

7. Nine less than the number c is the same as the number d , and d less than twice c is 20. Which two equations could be used to determine the value of c and d ?

A. $d - 9 = c$
 $d - 2c = 20$

B. $c - 9 = d$
 $2c - d = 20$

C. $c - 9 = d$
 $d - 2c = 20$

D. $9 - c = d$
 $2c - d = 20$

E. $9 - c = d$
 $2cd = 20$

8. A restaurant's fixed-price special dinner consists of an appetizer, an entrée, and dessert. If the restaurant offers 3 different types of appetizers, 5 different types of entrees, and 4 different types of desserts, how many different ways are there to order a fixed-price special dinner?

F. 4

G. 5

H. 12

J. 23

K. 60

9. At a recent audition for a school play, 1 out of 3 students who auditioned were asked to come to a second audition. After the second audition, 75% of those asked to the second audition were offered parts. If 18 students were offered parts, how many students went to the first audition?

A. 18

B. 24

C. 48

D. 56

E. 72

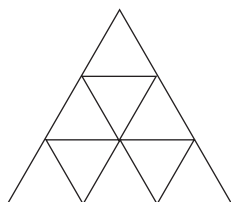
GO ON TO THE NEXT PAGE ➡

10. One number is 5 times another number and their sum is -60 . What is the lesser of the two numbers?

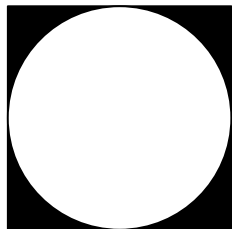
F. -5
G. -10
H. -12
J. -48
K. -50

DO YOUR FIGURING HERE.

11. In the figure below, which is composed of equilateral triangles, what is the greatest number of parallelograms that can be found?



- A. 6
B. 9
C. 12
D. 15
E. 18
12. The circle in the figure below is inscribed in a square with a perimeter of 16 inches. What is the area in square inches of the shaded region?



F. 4π
G. $16 - 2\pi$
H. $16 - 4\pi$
J. $8 - 2\pi$
K. $8 - 4\pi$

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

13. How many positive integers less than 50 are multiples of 4 but not multiples of 6?

A. 4
B. 6
C. 8
D. 10
E. 12

14. What is the value of $f(3)$ where

$$f(x) = (8 - 3x)(x^2 - 2x - 15)?$$

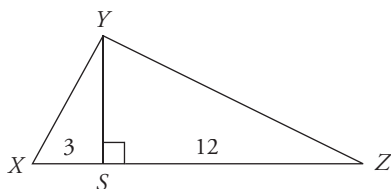
F. -30
G. -18
H. 12
J. 24
K. 30

15. A class contains five juniors and five seniors. If one member of the class is assigned at random to present a paper on a certain subject, and another member of the class is randomly assigned to assist him, what is the probability that both will be juniors?

A. $\frac{1}{10}$
B. $\frac{1}{5}$
C. $\frac{2}{9}$
D. $\frac{2}{5}$
E. $\frac{1}{2}$

GO ON TO THE NEXT PAGE ➡

16. In triangle XYZ below, \overline{XS} and \overline{SZ} are 3 and 12 units, respectively. If the area of triangle XYZ is 45 square units, how many units long is altitude \overline{YS} ?

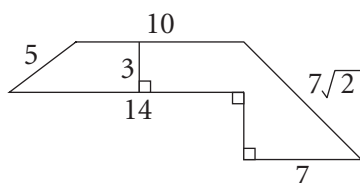


- F. 3
G. 6
H. 9
J. 12
K. 15
17. At which y -coordinate does the line described by the equation $6y - 3x = 18$ intersect the y -axis?
- A. 18
B. 9
C. 6
D. 3
E. 2
18. If $x^2 - y^2 = 12$ and $x - y = 4$, what is the value of $x^2 + 2xy + y^2$?
- F. 3
G. 8
H. 9
J. 12
K. 16

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE ➡

19. What is the area in square units of the figure below?



DO YOUR FIGURING HERE.

- A. 147
B. 108.5
C. 91
D. 60.5
E. $39 + 7\sqrt{2}$
20. A carpenter is cutting wood to make a new bookcase with a board that is 12 feet long. If the carpenter cuts off 3 pieces, each of which is 17 inches long, how many inches long is the remaining board? (A foot contains 12 inches.)
- F. 36
G. 51
H. 93
J. 108
K. 144
21. If $x^2 - 4x - 6 = 6$, what are the possible values for x ?
- A. 4, 12
B. -6, 2
C. -6, -2
D. 6, 2
E. 6, -2
22. If -3 is a solution for the equation $x^2 + kx - 15 = 0$, what is the value of k ?
- F. 5
G. 2
H. -2
I. -5
J. Cannot be determined from the information given

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

23. If the lengths, in inches, of all three sides of a triangle are integers, and one side is 7 inches long, what is the smallest possible perimeter of the triangle, in inches?

A. 9
B. 10
C. 12
D. 15
E. 18

24. If $0^\circ < \theta < 90^\circ$ and $\sin \theta = \frac{\sqrt{11}}{2\sqrt{3}}$, then $\cos \theta = ?$

F. $\frac{1}{2\sqrt{3}}$
G. $\frac{1}{\sqrt{11}}$
H. $\frac{2}{\sqrt{3}}$
J. $\frac{2\sqrt{3}}{\sqrt{11}}$
K. $\frac{11}{2\sqrt{3}}$

25. Which of the following expressions is equivalent to

$$\frac{\sqrt{3+x}}{\sqrt{3-x}} \text{ for all } x \text{ such that } -3 < x < 3?$$

A. $\frac{3-x}{3+x}$
B. $\frac{3+x}{3-x}$
C. $\frac{-3\sqrt{3+x}}{3-x}$
D. $\frac{\sqrt{9-x^2}}{3-x}$
E. $\frac{\sqrt{x^2-9}}{3+x}$

26. In a certain cookie jar containing only macaroons and gingersnaps, the ratio of macaroons to gingersnaps is 2 to 5. Which of the following could be the total number of cookies in the cookie jar?

F. 24
G. 35
H. 39
J. 48
K. 52

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

27. What is the sum of $\frac{3}{16}$ and .175?

- A. .3165
- B. .3500
- C. .3625
- D. .3750
- E. .3875

28. What is the maximum possible area, in square inches, of a rectangle with a perimeter of 20 inches?

- F. 15
- G. 20
- H. 25
- J. 30
- K. 40

29.
$$\frac{\frac{3}{2} + \frac{7}{4}}{\left(\frac{15}{8} - \frac{3}{4}\right) - \left(\frac{4+3}{-4+3}\right)} = ?$$

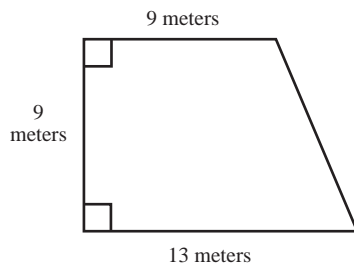
- A. $\frac{3}{8}$
- B. $\frac{2}{5}$
- C. $\frac{9}{13}$
- D. $\frac{5}{2}$
- E. $\frac{8}{3}$

30. If $x - 15 = 7 - 5(x - 4)$, then $x = ?$

- F. 0
- G. 2
- H. 4
- J. 5
- K. 7

GO ON TO THE NEXT PAGE ➡

31. The sketch below shows the dimensions of a flower garden. What is the area of this garden in square meters?



- A. 31
B. 85
C. 99
D. 101
E. 117
32. What is the slope of the line described by the equation $6y - 3x = 18$?
- F. -2
G. $-\frac{1}{2}$
H. $\frac{1}{2}$
J. 2
K. 3
33. Line m passes through the point $(4, 3)$ in the standard (x, y) coordinate plane, and is perpendicular to the line described by the equation $y = -\frac{4}{5}x + 6$. Which of the following equations describes line m ?
- A. $y = \frac{5}{4}x + 2$
B. $y = -\frac{5}{4}x + 6$
C. $y = \frac{4}{5}x - 2$
D. $y = -\frac{4}{5}x + 2$
E. $y = \frac{5}{4}x - 2$

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

34. Line t in the standard (x, y) coordinate plane has a y -intercept of -3 and is parallel to the line having the equation $3x - 5y = 4$. Which of the following is an equation for line t ?

F. $y = -\frac{3}{5}x + 3$

G. $y = -\frac{5}{3}x - 3$

H. $y = \frac{3}{5}x + 3$

J. $y = \frac{5}{3}x + 3$

K. $y = \frac{3}{5}x - 3$

35. If $y = mx + b$, which of the following equations expresses x in terms of y , m , and b ?

A. $x = \frac{y-b}{m}$

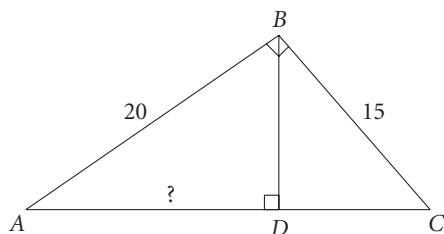
B. $x = \frac{b-y}{m}$

C. $x = \frac{y+b}{m}$

D. $x = \frac{y}{m} - b$

E. $x = \frac{y}{m} + b$

36. In the figure below, $\overline{AB} = 20$, $\overline{BC} = 15$, and $\angle ADB$ and $\angle ABC$ are right angles. What is the length of \overline{AD} ?



F. 9

G. 12

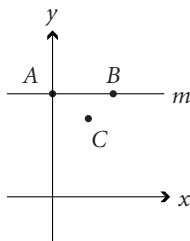
H. 15

J. 16

K. 25

GO ON TO THE NEXT PAGE ➡

37. In the standard (x, y) coordinate plane shown in the figure below, points A and B lie on line m , and point C lies below it. The coordinates of points A , B , and C are $(0, 5)$, $(5, 5)$, and $(3, 3)$, respectively. What is the shortest distance from point C to line m ?



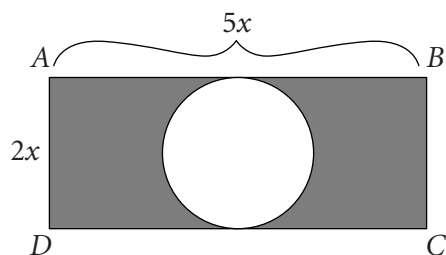
- A. 2
B. $2\sqrt{2}$
C. 3
D. $\sqrt{13}$
E. 5
38. For all $x \neq 8$, $\frac{x^2 - 11x + 24}{8 - x} = ?$
F. $8 - x$
G. $3 - x$
H. $x - 3$
J. $x - 8$
K. $x - 11$
39. Points A and B lie in the standard (x, y) coordinate plane. The (x, y) coordinates of A are $(2, 1)$ and the (x, y) coordinates of B are $(-2, -2)$. What is the distance from A to B ?
A. $3\sqrt{2}$
B. $3\sqrt{3}$
C. 5
D. 6
E. 7

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

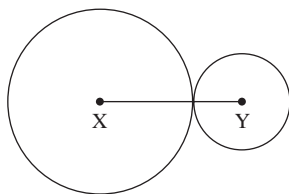
40. In the figure below, \overline{AB} and \overline{CD} are both tangent to the circle as shown, and $ABCD$ is a rectangle with side lengths $2x$ and $5x$ as shown. What is the area of the shaded region?



- F. $10\pi x^2$
G. $10x^2 - \pi x^2$
H. $10x^2 - 2\pi x$
J. $9\pi x^2$
K. $6\pi x^2$
41. If $0^\circ < \theta < 90^\circ$ and $\cos \theta = \frac{5\sqrt{2}}{8}$, then $\tan \theta = ?$
- A. $\frac{5}{\sqrt{7}}$
B. $\frac{\sqrt{7}}{5}$
C. $\frac{\sqrt{14}}{8}$
D. $\frac{8}{\sqrt{14}}$
E. $\frac{8}{5\sqrt{2}}$
42. Consider fractions of the form $\frac{7}{n}$, where n is an integer. How many integer values of n make this fraction greater than .5 and less than .8?
- F. 3
G. 4
H. 5
J. 6
K. 7

GO ON TO THE NEXT PAGE ➡

43. The circumference of circle X is 12π and the circumference of circle Y is 8π . What is the greatest possible distance between two points, one which lies on the circumference of X and one which lies on the circumference of Y ?

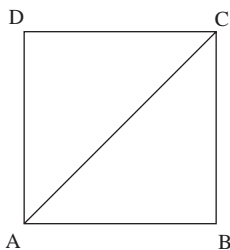


- A. 6
B. 10
C. 20
D. 10π
E. 20π
44. $\sqrt{(x^2 + 4)^2 - (x + 2)(x - 2)} = ?$
F. $2x^2$
G. $x^2 - 8$
H. $2(x - 2)$
J. 0
K. 8
45. If $s = -3$, then $s^3 + 2s^2 + 2s = ?$
A. -15
B. -10
C. -5
D. 5
E. 33
46. How many different numbers are solutions for the equation $2x + 6 = (x + 5)(x + 3)$?
F. 0
G. 1
H. 2
J. 3
K. Infinitely many

DO YOUR FIGURING HERE.

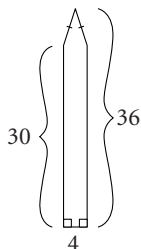
GO ON TO THE NEXT PAGE ➡

47. In square $ABCD$ below, $AC = 8$. What is the perimeter of $ABCD$?



DO YOUR FIGURING HERE.

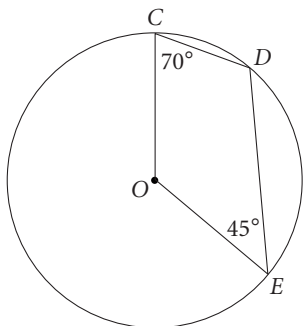
- A. $4\sqrt{2}$
B. 8
C. $8\sqrt{2}$
D. 16
E. $16\sqrt{2}$
48. The front surface of a fence panel is shown below with the lengths labeled representing inches. The panel is symmetrical along its center vertical axis. What is the surface area of the front surface of the panel in square inches?



- F. 144
G. 132
H. 120
J. 80
K. $64 + 6\sqrt{5}$

GO ON TO THE NEXT PAGE ➡

49. In the figure below, O is the center of the circle, and C , D , and E are points on the circumference of the circle. If $\angle OCD$ measures 70° and $\angle OED$ measures 45° , what is the measure of $\angle CDE$?



- A. 25°
B. 45°
C. 70°
D. 90°
E. 115°
50. Which of the following systems of equations does NOT have a solution?
- F. $x + 3y = 19$
 $3x + y = 6$
- G. $x + 3y = 19$
 $x - 3y = 13$
- H. $x - 3y = 19$
 $3x - y = 7$
- J. $x - 3y = 19$
 $3x + y = 6$
- K. $x + 3y = 6$
 $3x + 9y = 7$
51. What is the 46th digit to the right of the decimal point in the decimal equivalent of $\frac{1}{7}$?
- A. 1
B. 2
C. 4
D. 7
E. 8

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

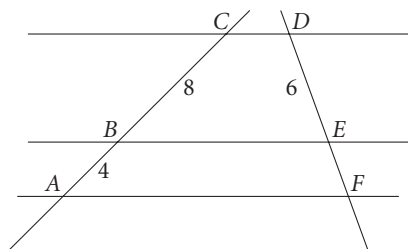
52. Which of the following inequalities is equivalent to $-2 - 4x \leq -6x$?

F. $x \geq -2$
G. $x \geq 1$
H. $x \geq 2$
J. $x \leq -1$
K. $x \leq 1$

53. If $x > 0$ and $y > 0$, $\frac{\sqrt{x}}{x} + \frac{\sqrt{y}}{y}$ is equivalent to which of the following?

A. $\frac{2}{\sqrt{xy}}$
B. $\frac{\sqrt{x} + \sqrt{y}}{\sqrt{xy}}$
C. $\frac{x+y}{xy}$
D. $\frac{\sqrt{x} + \sqrt{y}}{\sqrt{x+y}}$
E. $\frac{x+y}{\sqrt{xy}}$

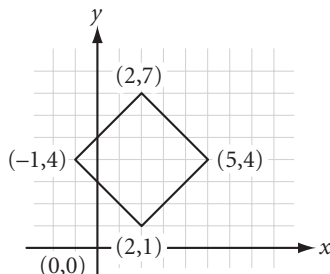
54. In the diagram below, \overline{CD} , \overline{BE} , and \overline{AF} are all parallel and are intersected by two transversals as shown. What is the length of \overline{EF} ?



F. 2
G. 3
H. 4
J. 6
K. 9

GO ON TO THE NEXT PAGE ➡

55. What is the area, in square units, of the square whose vertices are located at the (x,y) coordinate points indicated in the figure below?



- A. 9
B. 12
C. 16
D. 18
E. 24
56. Compared to the graph of $y = \cos \theta$, the graph of $y = 2 \cos \theta$ has:
- F. twice the period and the same amplitude.
G. half the period and the same amplitude.
H. twice the period and half the amplitude.
J. half the amplitude and the same period.
K. twice the amplitude and the same period.
57. Brandy has a collection of comic books. If she adds 15 to the number of comic books in her collection and multiplies the sum by 3, the result will be 65 less than 4 times the number of comic books in her collection. How many comic books are in her collection?
- A. 50
B. 85
C. 110
D. 145
E. 175

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE ➡

DO YOUR FIGURING HERE.

58. One empty cylinder has three times the height and twice the diameter of another empty cylinder. How many many fillings of the smaller cylinder would be equivalent to one filling of the larger cylinder?

(Note: The volume of a cylinder of radius r and height h is $\pi r^2 h$.)

- F. 6
G. $6\sqrt{2}$
H. 12
J. 18
K. 24
59. What is the perimeter of a 30° - 60° - 90° triangle with a long leg of 12 inches?
- A. $6\sqrt{3} + 12$
B. $4\sqrt{3} + 18$
C. $8\sqrt{3} + 18$
D. $12\sqrt{3} + 12$
E. $12\sqrt{3} + 18$
60. A baseball team scores an average of x points in its first n games and then scores y points in its next and final game of the season. Which of the following represents the team's average score for the entire season?
- F. $x + \frac{y}{n}$
G. $x + \frac{y}{n+1}$
H. $\frac{x+ny}{n+1}$
J. $\frac{nx+y}{n+1}$
K. $\frac{n(x+y)}{n+1}$

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK
ON

STOP

READING TEST

35 Minutes—40 Questions

Directions: This test contains four passages, each followed by several questions. After reading a passage, select the best answer to each question and fill in the corresponding oval on your answer sheet. You are allowed to refer to the passages while answering the questions.

Passage I

Emma Woodhouse, handsome, clever, and rich, with a comfortable home and happy disposition, seemed to unite some of the best blessings of existence. She had lived nearly twenty-one years in the world with very little to distress or vex her. She was the youngest of the two daughters of a most affectionate, indulgent father, and had, in consequence of her sister's marriage, been mistress of his house from a very early period. Her mother had died too long ago for her to have more than an indistinct remembrance of her caresses, and her place had been taken by an excellent governess who had fallen little short of a mother in affection.

Sixteen years had Miss Taylor been in Mr. Woodhouse's family, less as a governess than a friend, very fond of both daughters, but particularly of Emma. Between them it was more the intimacy of sisters. Even before Miss Taylor had ceased to hold the nominal office of governess, the mildness of her temper had hardly allowed her to impose any restraint. The shadow of authority being now long passed away, they had been living together as friend and friend very mutually attached, and Emma doing just what she liked, highly esteeming Miss Taylor's judgment, but directed chiefly by her own. The real evils, indeed, of Emma's situation were the power of having rather too much her own way, and a disposition to think a little too well of herself; these were the disadvantages which threatened alloy to her many enjoyments. The danger, however, was at present so unperceived, that they did not by any means rank as misfortunes with her.

Sorrow came—a gentle sorrow—but not at all in the shape of any disagreeable consciousness. Miss Taylor married. It was Miss Taylor's loss which first brought grief. It was on the wedding-day of this beloved friend that Emma first sat in mournful thought of any continuance. The wedding over, and the bride-people gone, she and her father were left to dine together, with no prospect of a third to cheer a long evening. Her father composed himself to sleep after dinner, as usual, and she had then only to sit and think of what she had lost.

The marriage had every promise of happiness for her friend. Mr. Weston was a man of unexceptionable

character, easy fortune, suitable age, and pleasant manners. There was some satisfaction in considering with what self-denying, generous friendship she had always wished and promoted the match, but it was a black morning's work for her. The want of Miss Taylor would be felt every hour of every day. She recalled her past kindness—the kindness, the affection of sixteen years—how she had taught her and how she had played with her from five years old—how she had devoted all her powers to attach and amuse her in health—and how she had nursed her through the various illnesses of childhood. A large debt of gratitude was owing here, but the intercourse of the last seven years, the equal footing and perfect unreserve which had soon followed Isabella's marriage, on their being left to each other, was yet a dearer, tenderer recollection. She had been a friend and companion such as few possessed: intelligent, well-informed, useful, gentle, knowing all the ways of the family, interested in all its concerns, and peculiarly interested in her, in every pleasure, every scheme of hers—one to whom she could speak every thought as it arose, and who had such an affection for her as could never find fault.

How was she to bear the change? It was true that her friend was going only half a mile from them, but Emma was aware that great must be the difference between a Mrs. Weston, only half a mile from them, and a Miss Taylor in the house. With all her advantages, natural and domestic, she was now in great danger of suffering from intellectual solitude.

This passage is an adapted excerpt from Jane Austen's novel *Emma*. In this passage, *Emma* confronts a change in her previously happy life.

1. According to the passage, what are the greatest disadvantages facing Emma?
 - A. Her father is not a stimulating conversationalist, and she is bored.
 - B. She is lonely and afraid that Mrs. Weston will not have a happy marriage.
 - C. She is used to having too much her way, and she thinks too highly of herself.
 - D. She misses the companionship of her mother, her sister, and Miss Taylor.

GO ON TO THE NEXT PAGE ➡

2. The name of Emma's sister is:
F. Mrs. Weston.
G. Isabella.
H. Miss Taylor.
J. Mrs. Woodhouse.
3. As described in the passage, Emma's relationship with Miss Taylor can be characterized as:
A. similar to a mother-daughter relationship.
B. similar to the relationship of sisters or best friends.
C. weaker than Emma's relationship with her sister.
D. stronger than Miss Taylor's relationship with her new husband.
4. As used in line 27, *disposition* can most closely be defined as:
F. a tendency.
G. control.
H. placement.
J. transfer.
5. Which of the following are included in Emma's memories of her relationship with Miss Taylor?
I. Miss Taylor taking care of Emma during childhood illnesses
II. Miss Taylor's interest in all of the concerns of Emma's family
III. Miss Taylor teaching her mathematics
IV. Miss Taylor scolding her for being selfish
A. I, III, and IV only
B. I and III only
C. II, III, and IV only
D. I and II only
6. It is most reasonable to infer from Emma's realization that "great must be the difference between a Mrs. Weston, only half a mile from them, and a Miss Taylor in the house" (lines 72–74) that:
F. Miss Taylor will no longer be a part of Emma's life.
G. Emma is happy about the marriage because now she will have more freedom.
H. Emma regrets that her relationship with Miss Taylor will change.
J. Emma believes that her relationship with Miss Taylor will become stronger.
7. Based on the passage, Emma could best be described as:
A. sweet and naïve.
B. self-centered and naïve.
C. self-centered and headstrong.
D. unappreciative and bitter.
8. The passage suggests that the quality Emma values most in a friend is:
F. charisma.
G. devotion.
H. honesty.
J. intelligence.
9. How does Emma view Mr. Weston?
A. She thinks that he is an excellent match, and it required considerable self-sacrifice to not pursue him herself.
B. She considers him to be a respectable if somewhat average match for her friend.
C. She sees him as an intruder who has carried away her best friend in "a black morning's work" (line 50).
D. She believes he is an indulgent, easily swayed man, reminiscent of her father.
10. From the passage, it can be inferred that Emma is accustomed to:
F. behaving according to the wishes of her affectionate father.
G. taking the advice of Miss Taylor when faced with deciding upon a course of action.
H. doing as she pleases without permission from her father or governess.
J. abiding by strict rules governing her behavior.

GO ON TO THE NEXT PAGE ➡

Passage II

The students had no idea of the real purpose of the study they had volunteered for.... So when 40 black and 40 white Princeton undergraduates volunteered to

- Line play mini-golf, the psychologists dissembled a bit.
 (5) This is a test of “natural ability,” Jeff Stone and his colleagues informed some of the kids. This is a test of “the ability to think strategically,” they told others. Then the students—non-golfers all—played the course, one at a time. Among those told the test
 (10) measured natural ability, black students scored, on average, more than four strokes better than whites. In the group told the test gauged strategic savvy, the white kids scored four strokes better, the researchers reported last year. “When people are reminded of a
 (15) negative stereotype about themselves—‘white men can’t jump’ or ‘black men can’t think’—it can adversely affect performance,” says Stone, now at the University of Arizona.

- Another group of students, 46 Asian American
 (20) female undergrads at Harvard, thought they were taking a tough, 12-question math test. Before one group attacked the advanced algebra, they answered written questions emphasizing ethnicity (“How many generations of your family have lived in America?”).
 (25) Another group’s questionnaire subtly reminded them of their gender (“Do you live on a co-ed or single-sex dorm floor?”). Women who took the math test after being reminded of their Asian heritage—and thus, it seems, the stereotype that Asians excel at math—
 (30) scored highest, getting 54 percent right. The women whose questionnaire implicitly reminded them of the stereotype that, for girls, “math is hard,” as Barbie infamously said, scored lowest, answering 43 percent correctly.

- (35) The power of stereotypes, scientists had long figured, lay in their ability to change the behavior of the person holding the stereotype.... But five years ago Stanford University psychologist Claude Steele showed something else: it is the targets of a stereotype
 (40) whose behavior is most powerfully affected by it. A stereotype that pervades the culture the way “ditzy blondes” and “forgetful seniors” do makes people painfully aware of how society views them—so painfully aware, in fact, that knowledge of the
 (45) stereotype can affect how well they do on intellectual and other tasks....

In their seminal 1995 study, Steele and Joshua Aronson, now at New York University, focused on how the threat posed by stereotypes affects African
 (50) Americans. They reasoned that whenever black students take on an intellectual task, like an SAT, they face the prospect of confirming widely held suspicions about their brainpower. This threat, the psychologists

- suspected, might interfere with performance. To test
 (55) this hunch, Steele and Aronson gave 44 Stanford undergrads questions from the verbal part of the tough Graduate Record Exam. One group was asked, right before the test, to indicate their year in school, age, major, and other information. The other group
 (60) answered all that, as well as one final question: what is your race? The results were sobering. “Just listing their race undermined the black students’ performance,” says Steele, making them score significantly worse than blacks who did not note their
 (65) race, and significantly worse than all whites. But the performance of black Stanfordites who were not explicitly reminded of their race equaled that of whites, found the scientists.

- You do not even have to believe a negative
 (70) stereotype to be hurt by it, psychologists find. As long as you care about the ability you’re being tested on, such as golfing or math, and are familiar with the stereotype (“girls can’t do higher math”), it can sink you. What seems to happen is that as soon as you
 (75) reach a tough par three or a difficult trig problem, the possibility of confirming, and being personally reduced to, a painful stereotype causes enough distress to impair performance. “If you are a white male and you find yourself having difficulty, you may begin to
 (80) worry about failing the test,” says psychologist Paul Davies of Stanford in an upcoming paper. But “if you are a black male...you begin to worry...about failing your race by confirming a negative stereotype.”

The passage below is excerpted from “The Stereotype Trap” by Sharon Begley (© 2000 Newsweek, Inc.). The passage explains recent research on the effects of stereotypes on performance.

11. According to the passage, simply specifying one’s race before a test:
- A. has a more marked effect than specifying one’s gender.
 - B. is too inconsequential to have any significant influence.
 - C. can affect one’s performance on that test.
 - D. is less likely to have influence than seeing subliminal messages flashed quickly on a monitor.

GO ON TO THE NEXT PAGE ➡

12. According to the passage, which of the following is NOT true?
- F. A person must believe that a stereotype is true in order to be affected by that stereotype.
 - G. Stereotypes about race, age, and gender have all been demonstrated to affect the performance of test subjects.
 - H. Though the influence of stereotypes on their subjects has only been investigated relatively recently, the influence of stereotypes on those who believe them has long been accepted.
 - J. Stereotypes can continue to have an influence on people throughout their lives.
13. It can be inferred from the description of the experiment in the first paragraph (lines 1–18) that many of the students involved:
- I. were aware of racial stereotypes about inherent physical and mental abilities.
 - II. felt pressure to disprove the hypothesis of the experiment.
 - III. likely scored differently because of educational disparities.
- A. I only
 - B. II only
 - C. I and II only
 - D. I and III only
14. The author most likely mentions “a difficult trig” problem in line 75 to:
- F. emphasize that most stereotypes involve mental abilities.
 - G. provide an example of a task with which stereotypes can interfere.
 - H. imply that gender stereotypes, like those about mathematical ability, have more influence than stereotypes about age or race.
 - J. explain the existence of prevalent gender stereotypes about mathematical reasoning.
15. Based on the passage, the author would most likely agree with which of the following?
- A. By understanding the origins of stereotypes, we can work towards a world in which fewer and fewer people believe such ideas.
 - B. Although stereotypes about race and age are still prevalent, gender stereotypes are increasingly less widespread.
 - C. It is possible to be severely affected by a stereotype which you believe to be untrue.
 - D. As people grow older, they are likely to be less directly affected by stereotypes.
16. The primary intent of the author of the passage was most likely to:
- F. trace the history of the effect of stereotypes on test performance.
 - G. explain the sociological mechanisms by which stereotypes develop and spread.
 - H. summarize a number of scientific investigations into the influence of stereotypes on those about whom the stereotypes are held.
 - J. investigate the extent to which racial stereotypes affect students’ performance on college entrance exams.
17. As used in line 4, the word *dissembled* most closely means:
- A. took apart.
 - B. hid their true purpose.
 - C. talked extensively.
 - D. communicated in an unfamiliar way.
18. Which of the following characteristics is NOT the subject of a stereotype cited in the passage?
- F. Age
 - G. Gender
 - H. Religion
 - J. Race
19. Based on the final paragraph, it is reasonable to infer that the author believes which of the following?
- A. People can be influenced by stereotypes while making important life decisions.
 - B. People are unlikely to change long-held beliefs based on exposure to stereotypes.
 - C. “Subliminal priming” provides too brief an exposure to adequately assess the impact of stereotypes.
 - D. Exposure to negative stereotypes is the primary cause of frailty and senility in seniors.
20. What was the conclusion of the “seminal 1995 study” cited in line 47?
- F. Stereotypes about “natural ability” often have more impact than those about mental abilities.
 - G. Because of a need to disprove negative stereotypes, many African Americans perform better when aware of those stereotypes.
 - H. For the undergraduates studied, stereotypes about the mathematical ability of Asian Americans had more impact than stereotypes about the same ability in African Americans.
 - J. For many African Americans, an awareness of negative stereotypes about intellectual ability can impair test performance.

GO ON TO THE NEXT PAGE ➡

Passage III

Line There can be little doubt that women artists have
(5) been most prominent in photography and that they
have made their greatest contribution in this field. One
reason for this is not difficult to ascertain. As several
historians of photography have pointed out,
photography, being a new medium outside the
traditional academic framework, was wide open to
women and offered them opportunities that the older
fields did not....

(10) All these observations apply to the first woman to
have achieved eminence in photography, and that is
Julia Margaret Cameron.... Born in 1815 in Calcutta
into an upper-middle-class family and married to
Charles Hay Cameron, a distinguished jurist and
(15) member of the Supreme Court of India, Julia Cameron
was well-known as a brilliant conversationalist and a
woman of personality and intellect who was
unconventional to the point of eccentricity. Although
the mother of six children, she adopted several more
(20) and still found time to be active in social causes and
literary activities. After the Camerons settled in
England in 1848 at Freshwater Bay on the Isle of
Wight, she became the center of an artistic and literary
circle that included such notable figures as the poet
(25) Alfred Lord Tennyson and the painter George
Frederick Watts. Pursuing numerous activities and
taking care of her large family, Mrs. Cameron might
have been remembered as still another rather
remarkable and colorful Victorian lady had it not been
(30) for the fact that, in 1863, her daughter presented her
with photographic equipment, thinking her mother
might enjoy taking pictures of her family and friends.
Although forty-eight years old, Mrs. Cameron took up
this new hobby with enormous enthusiasm and
(35) dedication. She was a complete beginner, but within a
very few years she developed into one of the greatest
photographers of her period and a giant in the history
of photography. She worked ceaselessly as long as
daylight lasted and mastered the technical processes of
(40) photography, at that time far more cumbersome than
today, turning her coal house into a darkroom and her
chicken house into a studio. To her, photography was a
“divine art,” and in it she found her vocation. In 1864,
she wrote triumphantly under one of her photographs,
(45) “My First Success,” and from then until her death in
Ceylon in 1874, she devoted herself wholly to this art.

Working in a large format (her portrait studies are
usually about 11 inches by 14 inches) and requiring a
long exposure (on the average five minutes), she
(50) produced a large body of work that stands up as one of
the notable artistic achievements of the Victorian
period. The English art critic Roger Fry believed that
her portraits were likely to outlive the works of artists

who were her contemporaries. Her friend Watts, then a
(55) very celebrated portrait painter, inscribed on one of her
photographs, “I wish I could paint such a picture as
this.” ...Her work was widely exhibited, and she
received gold, silver, and bronze medals in England,
America, Germany, and Austria. No other female artist
(60) of the nineteenth century achieved such acclaim, and
no other woman photographer has ever enjoyed such
success.

Her work falls into two main categories on which
her contemporaries and people today differ sharply.
(65) Victorian critics were particularly impressed by her
allegorical pictures, many of them based on the poems
of her friend and neighbor Tennyson... Contemporary
taste much prefers her portraits and finds her narrative
scenes sentimental and sometimes in bad taste. Yet,
(70) not only Julia Cameron, but also the painters of that
time loved to depict subjects such as *The Five Foolish
Virgins* or *Pray God, Bring Father Safely Home*. Still,
today her fame rests upon her portraits for, as she
herself said, she was intent upon representing not only
(75) the outer likeness but also the inner greatness of the
people she portrayed. Working with the utmost
dedication, she produced photographs of such eminent
Victorians as Tennyson, Browning, Carlyle, Trollope,
Longfellow, Watts, Darwin, Ellen Terry, Sir John
(80) Herschel, who was a close friend of hers, and Mrs.
Duckworth, the mother of Virginia Woolf.

This passage is excerpted from *A History of Women Artists* by
Hugo Munsterberg. (© 1975 by Hugo Munsterberg. Reprinted by
permission of Clarkson N. Potter, Inc., a division of Crown
Publishers, Inc.)

21. Which of the following conclusions can be reasonably drawn from the passage's discussion of Julia Margaret Cameron?
- A. She was a traditional homemaker until she discovered photography.
 - B. Her work holds a significant place in the history of photography.
 - C. She was unable to achieve in her lifetime the artistic recognition she deserved.
 - D. Her eccentricity has kept her from being taken seriously by modern critics of photography.

GO ON TO THE NEXT PAGE ➡

22. According to the passage, Cameron is most respected by modern critics for her:
- F. portraits.
 - G. allegorical pictures.
 - H. use of a large format.
 - J. service in recording the faces of so many twentieth-century figures.
23. The author uses which of the following methods to develop the second paragraph (lines 10–46)?
- A. A series of anecdotes depicting Cameron’s energy and unconventionality
 - B. A presentation of factual data demonstrating Cameron’s importance in the history of photography
 - C. A description of the author’s personal acquaintance with Cameron
 - D. A chronological account of Cameron’s background and artistic growth
24. As it is used in the passage, *cumbersome* (line 40) most closely means:
- F. difficult to manage.
 - G. expensive.
 - H. intense.
 - J. enjoyable.
25. When the author says that Cameron had found “her vocation” (line 43), his main point is that photography:
- A. offered Cameron an escape from the confines of conventional social life.
 - B. became the main interest of her life.
 - C. became her primary source of income.
 - D. provided her with a way to express her religious beliefs.
26. The main point of the third paragraph is that Cameron:
- F. achieved great artistic success during her lifetime.
 - G. is the greatest photographer that ever lived.
 - H. was considered a more important artist during her lifetime than she is now.
 - J. revolutionized photographic methods in the Victorian era.
27. According to the passage, the art of photography offered women artists more opportunities than did other art forms because it:
- A. did not require expensive materials.
 - B. allowed the artist to use family and friends for subject matter.
 - C. was nontraditional.
 - D. required little artistic skill.
28. *The Five Foolish Virgins* and *Pray God, Bring Father Safely Home* are examples of:
- F. portraits of celebrated Victorians.
 - G. allegorical subjects of the sort that were popular during the Victorian era.
 - H. photographs in which Cameron sought to show a subject’s outer likeness and inner greatness.
 - J. photographs by Cameron that were scoffed at by her contemporaries.
29. According to the passage, which of the following opinions of Cameron’s work was held by Victorian critics but is NOT held by modern critics?
- A. Photographs should be based on poems.
 - B. Her portraits are too sentimental.
 - C. Narrative scenes are often in bad taste.
 - D. Her allegorical pictures are her best work.
30. The author’s treatment of Cameron’s development as a photographer can best be described as:
- F. admiring.
 - G. condescending.
 - H. neutral.
 - J. defensive.

GO ON TO THE NEXT PAGE ➡

Passage IV

Line When the first of the two Viking Landers touched
(5) down on Martian soil on July, 1976, and began to send
camera images back to Earth, the scientists at the Jet
Propulsion Laboratory could not suppress a certain
(10) nervous anticipation, like people who hold a ticket to a
lottery they have a one-in-a-million chance of
winning. The first photographs that arrived, however,
did not contain any evidence of life. What was
revealed was merely a barren landscape littered with
(15) rocks and boulders. The view resembled nothing so
much as a flat section of desert—in fact, the winning
entry in a contest at J.P.L. for the photograph most
accurately predicting what Mars would look like was a
snapshot taken from a particularly arid section of the
Mojave Desert.

The scientists were soon ready to turn their
attention from visible life to microorganisms. The twin
Viking Landers carried experiments designed to detect
organic compounds. Researchers thought it possible
(20) that life had developed on early Mars just as it is
thought to have developed on Earth, through the
gradual chemical evolution of complex organic
molecules. To detect biological activity, Martian soil
samples were treated with various nutrients that would
(25) produce characteristic by-products if life forms were
active in the soil. The results from all three
experiments were inconclusive. The fourth experiment
heated a soil sample to look for signs of organic
material but found none, an unexpected result because
(30) at least organic compounds from the steady
bombardment of the Martian surface by meteorites
were thought to have been present.

The absence of organic materials, some scientists
speculated, was the result of intense ultraviolet
(35) radiation penetrating the atmosphere of Mars and
destroying organic compounds in the soil. Although
Mars' atmosphere was at one time rich in carbon
dioxide and thus thick enough to protect its surface
from the harmful rays of the Sun, the carbon dioxide
(40) had gradually left the atmosphere and been converted
into rocks. This means that even if life had gotten a
start on early Mars, it could not have survived the
exposure to ultraviolet radiation when the atmosphere
thinned. Mars never developed a protective layer of
(45) ozone as Earth did.

Despite the disappointing Viking results, there are
those who still keep open the possibility of life on
Mars. They point out that the Viking data cannot be
considered the final word on Martian life because the
(50) two landers only sampled limited—and
uninteresting—sites. The Viking landing sites were not
chosen for what they might tell of the planet's biology.
They were chosen primarily because they appeared to

be safe for landing a spacecraft. The landing sites were
(55) on parts of the Martian plains that appeared relatively
featureless from orbital photographs.

The type of terrain that these researchers suggest
may be a possible hiding place for active life has an
Earthly parallel: the ice-free region of southern
(60) Victoria Land, Antarctica, where the temperatures in
some dry valleys average below zero. Organisms
known as endoliths, a form of blue-green algae that
has adapted to this harsh environment, were found
living inside certain translucent, porous rocks in these
(65) Antarctic valleys. The argument based on this
discovery is that if life did exist on early Mars, it is
possible that it escaped worsening conditions by
similarly seeking refuge in rocks. Skeptics object,
however, that Mars in its present state is simply too
(70) dry, even compared with Antarctic valleys, to sustain
any life whatsoever.

Should Mars eventually prove to be barren of life,
as some suspect, then this would have a significant
impact on the current view of the chemical origins of
(75) life. It could be much more difficult to get life started
on a planet than scientists thought before the Viking
landings.

This passage from a textbook about the solar system discusses
research examining the possibility of life on Mars.

31. The word *suppress*, as used in line 4, most nearly means:
A. oppose.
B. vanquish.
C. prohibit.
D. stifle.
32. According to the passage, scientists treated Martian soil samples with nutrients in order to:
F. test for the presence of life-forms.
G. verify the results of their experiments.
H. investigate ways of starting life on other planets.
J. find evidence of meteorite bombardment.
33. According to the passage, scientists expected organic compounds to be present on Mars as a result of:
A. alien civilizations.
B. ultraviolet radiation.
C. meteor bombardment.
D. atmospheric activity.

GO ON TO THE NEXT PAGE ➡

34. The passage suggests that an important difference between Mars and Earth is that, unlike Earth, Mars:
- F. accumulated organic compounds in its soil.
 - G. lies in the path of harmful rays of ultraviolet radiation.
 - H. once possessed an atmosphere rich in carbon dioxide.
 - J. could not sustain any life that developed.
35. According to the passage, the surface of Mars most resembles:
- A. southern Florida.
 - B. the Mojave desert.
 - C. southern Victoria Land.
 - D. the ice valleys of Antarctica.
36. The main point of the second paragraph (lines 16–32) is that:
- F. scientists were disappointed by the inconclusive results of their experiments.
 - G. theories about how life developed on Earth were shown to be flawed.
 - H. there was no experimental confirmation that life exists on Mars.
 - J. meteorite bombardment of the Martian surface is less constant than scientists predicted.
37. The researchers' argument that life may exist in Martian rocks rests on the idea that:
- A. life evolved in the same way on two different planets.
 - B. organisms may adopt identical survival strategies in similar environments.
 - C. life developed in the form of a blue-green algae on Mars.
 - D. organisms that survived in Antarctica could survive on Mars.
38. According to the passage, the results of the Viking Mission could eventually have a "significant impact" (lines 73–74) because:
- F. future expeditions to Mars may take samples from many different sites.
 - G. current theories about how life began on Earth may have to be changed.
 - H. scientists may be forced to acknowledge that life does not exist on other planets.
 - J. the focus of research into the evolution of life may shift to Antarctica.
39. According to the passage, any organic materials that existed on Mars were probably destroyed by:
- I. ultraviolet radiation.
 - II. carbon dioxide in the atmosphere.
 - III. the absence of a layer of ozone.
- A. I only
 - B. I and II only
 - C. I and III only
 - D. I, II, and III
40. Which of the following statements is best supported by the fourth paragraph (lines 46–56)?
- F. The Viking Mission was unsuccessful due to poor selection of landing sites.
 - G. The results of the Viking mission do not prove that Mars is devoid of life.
 - H. The detection of life on Mars was not a primary objective of the Viking mission.
 - J. Scientists were not expecting to discover life on the Martian plains.

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT TURN TO ANY OTHER SECTION IN THE TEST.

STOP

SCIENCE REASONING TEST

35 Minutes—40 Questions

Directions: Each of the following seven passages is followed by several questions. After reading each passage, decide on the best answer to each question and fill in the corresponding oval on your answer sheet. You are allowed to refer to the passages while answering the questions.

Passage I

The table below contains some physical properties of common optical materials. The refractive index of a material is a measure of the amount by which light is bent upon entering the material. The transmittance range is the range of wavelengths over which the material is transparent.

Physical Properties of Optical Materials				
Material	Refractive index for light of 0.589 μm	Transmittance range (μm)	Useful range for prisms (μm)	Chemical resistance
Lithium fluoride	1.39	0.12–6	2.7–5.5	Poor
Calcium fluoride	1.43	0.12–12	5–9.4	Good
Sodium chloride	1.54	0.3–17	8–16	Poor
Quartz	1.54	0.20–3.3	0.20–2.7	Excellent
Potassium bromide	1.56	0.3–29	15–28	Poor
Flint glass*	1.66	0.35–2.2	0.35–2	Excellent
Cesium iodide	1.79	0.3–70	15–55	Poor

*Flint glass is lead oxide doped quartz.

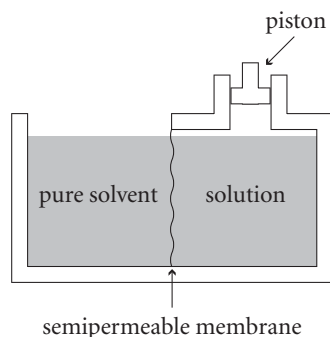
- According to the table, which material(s) will transmit light at 25 μm ?
 - Potassium bromide only
 - Potassium bromide and cesium iodide
 - Lithium fluoride and cesium iodide
 - Lithium fluoride and flint glass
- A scientist hypothesizes that any material with poor chemical resistance would have a transmittance range wider than 10 μm . The properties of which of the following materials contradicts this hypothesis?
 - Lithium fluoride
 - Flint glass
 - Cesium iodide
 - Quartz
- When light travels from one medium to another, total internal reflection can occur if the first medium has a higher refractive index than the second. Total internal reflection could occur if light were travelling from:
 - lithium fluoride to flint glass.
 - potassium bromide to cesium iodide.
 - quartz to potassium bromide.
 - flint glass to calcium fluoride.
- Based on the information in the table, how is the transmittance range related to the useful prism range?
 - The transmittance range is always narrower than the useful prism range.
 - The transmittance range is narrower than or equal to the useful prism range.
 - The transmittance range increases as the useful prism range decreases.
 - The transmittance range is wider than and includes within it the useful prism range.

GO ON TO THE NEXT PAGE ➡

5. The addition of lead oxide to pure quartz has the effect of:
- decreasing the transmittance range and the refractive index.
 - decreasing the transmittance range and increasing the refractive index.
 - increasing the transmittance range and the useful prism range.
 - increasing the transmittance range and decreasing the useful prism range.

Passage II

Osmosis is the diffusion of a solvent (often water) across a semipermeable membrane from the side of the membrane with a lower concentration of dissolved material to the side with a higher concentration of dissolved material. The result of osmosis is an equilibrium—an even distribution—on both sides of the membrane. In order to prevent osmosis, external pressure must be applied to the side with the higher concentration of dissolved material. *Osmotic pressure* is the external pressure required to prevent osmosis. The apparatus shown below was used to measure osmotic pressure in the following experiments.



Experiment 1

Aqueous (water-based) solutions containing different concentrations of sucrose were placed in the closed side of the apparatus. The open side was filled with water. The sucrose solutions also contained a blue dye that binds to the sucrose. The osmotic pressure created by the piston was measured for each solution at various temperatures. The results are given in Table 1.

Table 1

Concentration of sucrose solution (mol/L)	Temperature (K)	Osmotic pressure (atm)
1.00	298.0	24.47
0.50	298.0	12.23
0.10	298.0	2.45
0.05	298.0	1.22
1.00	348.0	28.57
0.50	348.0	14.29
0.10	348.0	2.86
0.05	348.0	1.43

GO ON TO THE NEXT PAGE ➡

Experiment 2

Sucrose solutions of 4 different organic solvents were investigated in the same manner as in Experiment 1 with all trials at 298 K. The results are shown in Table 2.

Table 2

Solvent	Concentration of sucrose solution (mol/L)	Osmotic pressure (atm)
Ethanol	0.50	12.23
Ethanol	0.10	2.45
Acetone	0.50	12.23
Acetone	0.10	2.45
Diethyl ether	0.50	12.23
Diethyl ether	0.10	2.45
Methanol	0.50	12.23
Methanol	0.10	2.45

6. According to the experimental results, osmotic pressure is dependent upon the:
- F. solvent and temperature only.
 - G. solvent and concentration only.
 - H. temperature and concentration only.
 - J. solvent, temperature, and concentration.
7. According to Experiment 2, if methanol was used as a solvent, what pressure must be applied to a 0.5 mol/L solution of sucrose at 298 K to prevent osmosis?
- A. 24.46 atm
 - B. 12.23 atm
 - C. 2.45 atm
 - D. 1.23 atm
8. A 0.10 mol/L aqueous sucrose solution is separated from an equal volume of pure water by a semipermeable membrane. If the solution is at a pressure of 1 atm and a temperature of 298 K, the sucrose solution:
- F. will diffuse across the semipermeable membrane from the sucrose solution side to the pure water side.
 - G. will diffuse across the semipermeable membrane from the pure water side to the sucrose solution side.
 - H. will not diffuse across the semipermeable membrane.
 - J. will diffuse across the semipermeable membrane, but the direction of diffusion cannot be determined.
9. In Experiment 1, the scientists investigated the effect of:
- A. solvent and concentration on osmotic pressure.
 - B. volume and temperature on osmotic pressure.
 - C. concentration and temperature on osmotic pressure.
 - D. temperature on atmospheric pressure.
10. Which of the following conclusions can be drawn from the experimental results?
- I. Osmotic pressure is independent of the solvent used.
 - II. Osmotic pressure is only dependent upon the temperature of the system.
 - III. Osmosis occurs only when the osmotic pressure is exceeded.
- F. I only
 - G. III only
 - H. I and II only
 - J. I and III only
11. What was the most likely purpose of the dye placed in the sucrose solutions in Experiments 1 and 2?
- A. The dye showed when osmosis was completed.
 - B. The dye showed the presence of ions in the solutions.
 - C. The dye was used to make the experiment more colorful.
 - D. The dye was used to make the onset of osmosis visible.

GO ON TO THE NEXT PAGE ➡

Passage III

A chemist investigating the influence of molecular weight and structure on the boiling point (transition from solid to gaseous state) of different compounds recorded the data in the tables below. Two types of compounds were investigated: organic carbon compounds (shown in Table 1) and inorganic compounds (shown in Table 2).

Table 1

Straight-Chain Hydrocarbons		
Molecular formula	Molar weight* (g/mol)	Boiling point (°C)
CH ₄	16	-162
C ₂ H ₆	30	-88
C ₃ H ₈	44	-42
C ₄ H ₁₀	58	0
C ₅ H ₁₂	72	36
C ₈ H ₁₈	114	126
C ₂₀ H ₄₂	282	345

*Molar weight is the weight of one mole, or an Avogadro's Number of molecules ($\approx 6 \times 10^{23}$), in grams.

Table 2

Other Substances (Polar and Nonpolar)		
Molecular formula	Molar weight* (g/mol)	Boiling point (°C)
N ₂ *	28	-196
SiH ₄ *	32	-112
GeH ₄ *	77	-90
Br ₂ *	160	59
CO**	28	-192
PH ₃ **	34	-85
AsH ₃ **	78	-55
ICl**	162	97

* *Nonpolar*: molecule's charge is evenly distributed

** *Polar*: molecule's negative and positive charges are partially separated

GO ON TO THE NEXT PAGE ➡

12. Which of the following straight-chain hydrocarbons would NOT be a gas at room temperature?
- F. C_2H_6
G. C_3H_8
H. C_4H_{10}
J. C_5H_{12}
13. Which of the following conclusions is supported by the observed results?
- I. Boiling point varies directly with molecular weight.
II. Boiling point varies inversely with molecular weight.
III. Boiling point is affected by molecular structure.
- A. I only
B. II only
C. I and III only
D. II and III only
14. Based on the data in Table 1, the boiling point of the straight-chain hydrocarbon C_6H_{14} (molecular weight 86 g/mol) is most likely:
- F. 30°C .
G. 70°C .
H. 130°C .
J. impossible to predict.
15. Based on the data in Table 2, as molecular weight increases, the difference between the boiling points of polar and nonpolar substances of similar molecular weight:
- A. increases.
B. decreases.
C. remains constant.
D. varies randomly.
16. A polar substance with a boiling point of 0°C is likely to have a molar weight closest to which of the following:
- F. 58
G. 80
H. 108
J. 132
17. Which of the following places the compound types in ascending order according to the rate at which the boiling point increases with increasing molar weight?
- A. straight-chain hydrocarbons, nonpolar inorganic compounds, polar inorganic compounds
B. straight-chain hydrocarbons, polar inorganic compounds, nonpolar inorganic compounds
C. nonpolar inorganic compounds, straight-chain hydrocarbons, polar inorganic compounds
D. nonpolar inorganic compounds, polar inorganic compounds, straight-chain hydrocarbons

Passage IV

A series of experiments was performed to study the environmental factors affecting the size and number of leaves on the *Cyas* plant.

Experiment 1

Five groups of 25 *Cyas* seedlings, all 2–3 cm tall, were allowed to grow for 3 months, each group at a different humidity level. All of the groups were kept at 75°F and received 9 hours of sunlight a day. The average leaf lengths, widths, and densities are given in Table 1.

Table 1

% Humidity	Average length (cm)	Average width (cm)	Average density* (leaves/cm)
15	5.6	1.6	0.13
35	7.1	1.8	0.25
55	9.8	2.0	0.56
75	14.6	2.6	0.61
95	7.5	1.7	0.52

*Number of leaves per 1 cm of plant stalk

GO ON TO THE NEXT PAGE ➡

Experiment 2

Five new groups of 25 seedlings, all 2–3 cm tall, were allowed to grow for 3 months, each group receiving different amounts of sunlight at a constant humidity of 55%. All other conditions were the same as in Experiment 1. The results are listed in Table 2.

Table 2

Sunlight (hrs/day)	Average length (cm)	Average width (cm)	Average density* (leaves/cm)
0	5.3	1.5	0.32
3	12.4	2.4	0.59
6	11.2	2.0	0.56
9	8.4	1.8	0.26
12	7.7	1.7	0.19

*Number of leaves per 1 cm of plant stalk

Experiment 3

Five new groups of 25 seedlings, all 2–3 cm tall, were allowed to grow at a constant humidity of 55% for 3 months at different daytime and nighttime temperatures. All other conditions were the same as in Experiment 1. The results are shown in Table 3.

Table 3

Day/Night temperature (°F)	Average length (cm)	Average width (cm)	Average density* (leaves/cm)
85/85	6.8	1.5	0.28
85/65	12.3	2.1	0.53
65/85	8.1	1.7	0.33
75/75	7.1	1.9	0.45
65/65	8.3	1.7	0.39

*Number of leaves per 1 cm of plant stalk

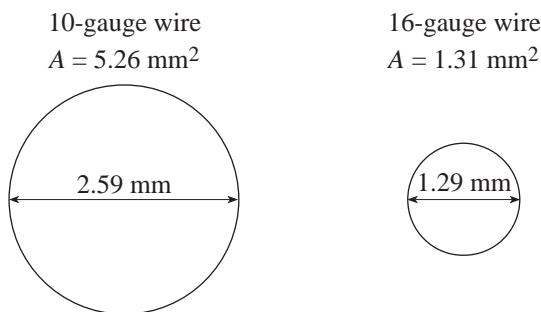
GO ON TO THE NEXT PAGE ➡

18. Which of the following conclusions can be made based on the results of Experiment 2 alone?
- F. The seedlings do not require long daily periods of sunlight to grow.
 - G. The average leaf density is independent of the humidity the seedlings receive.
 - H. The seedlings need more water at night than during the day.
 - J. The average length of the leaves increases as the amount of sunlight increases.
19. Seedlings grown at a 40% humidity level under the same conditions as in Experiment 1 would have average leaf widths closest to:
- A. 1.6 cm.
 - B. 1.9 cm.
 - C. 2.2 cm.
 - D. 2.5 cm.
20. According to the experimental results, under which set of conditions would a *Cyas* seedling be most likely to produce the largest leaves?
- F. 95% humidity and 3 hours of sunlight
 - G. 75% humidity and 3 hours of sunlight
 - H. 95% humidity and 6 hours of sunlight
 - J. 75% humidity and 6 hours of sunlight
21. Which variable remained constant throughout all of the experiments?
- A. The number of seedling groups
 - B. The percent of humidity
 - C. The daytime temperature
 - D. The nighttime temperature
22. It was assumed in the design of the 3 experiments that all of the *Cyas* seedlings were:
- F. more than 5 cm tall.
 - G. equally capable of germinating.
 - H. equally capable of producing flowers.
 - J. equally capable of further growth.
23. As a continuation of the 3 experiments listed, it would be most appropriate to next investigate:
- A. how many leaves over 6.0 cm long there are on each plant.
 - B. which animals consume *Cyas* seedlings.
 - C. how the mineral content of the soil affects the leaf size and density.
 - D. what time of year the seedlings have the darkest coloring.

Passage V

The resistance (R) of a conductor is the extent to which it opposes the flow of electricity. Resistance depends not only on the conductor's resistivity (ρ), but also on the conductor's length (L) and cross-sectional area (A). The resistivity of a conductor is a physical property of the material that varies with temperature.

A research team designing a new appliance was researching the best type of wire to use in a particular circuit. The most important consideration was the wire's resistance. The team studied the resistance of wires made from four metals—gold (Au), aluminum (Al), tungsten (W), and iron (Fe). Two lengths and two gauges (diameters) of each type of wire were tested at 20° C. The results are recorded in the table below:



Note: area of circle = πr^2

GO ON TO THE NEXT PAGE ➡

Material	Resistivity ($\mu\Omega \supseteq \text{cm}$)	Length (cm)	Cross-sectional area (mm^2)	Resistance ($\mu\Omega$)
Au	2.44	1.0	5.26	46.4
Au	2.44	1.0	1.31	186.0
Au	2.44	2.0	5.26	92.8
Au	2.44	2.0	1.31	372.0
Al	2.83	1.0	5.26	53.8
Al	2.83	1.0	1.31	216.0
Al	2.83	2.0	5.26	107.6
Al	2.83	2.0	1.31	432.0
W	5.51	1.0	5.26	105.0
W	5.51	1.0	1.31	421.0
W	5.51	2.0	5.26	210.0
W	5.51	2.0	1.31	842.0
Fe	10.00	1.0	5.26	190.0
Fe	10.00	1.0	1.31	764.0
Fe	10.00	2.0	5.26	380.0
Fe	10.00	2.0	1.31	1,528.0

24. Of the wires tested, resistance increases for any given material as which parameter is decreased?

F. Length
G. Cross-sectional area
H. Resistivity
J. Gauge

25. Given the data in the table, which of the following best expresses resistance in terms of resistivity (ρ), cross-sectional area (A), and length (L)?

A. $\frac{\rho A}{L}$
B. $\frac{\rho L}{A}$
C. ρAL
D. $\frac{AL}{\rho}$

26. Which of the following wires would have the highest resistance?

F. A 1-cm aluminum wire with a cross-sectional area of 3.31 mm^2
G. A 2-cm aluminum wire with a cross-sectional area of 3.31 mm^2
H. A 1-cm tungsten wire with a cross-sectional area of 0.33 mm^2
J. A 2-cm tungsten wire with a cross-sectional area of 0.33 mm^2

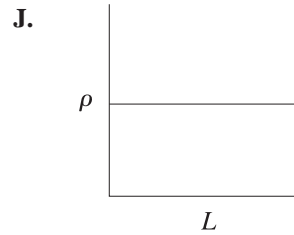
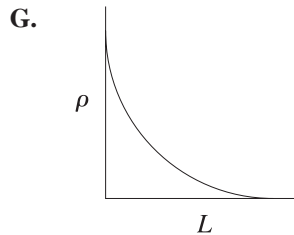
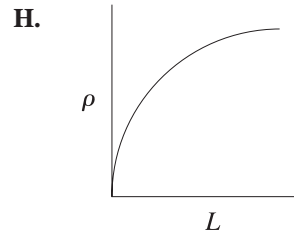
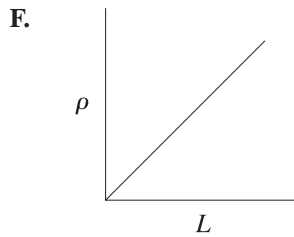
27. According to the information given, which of the following statements is (are) correct?

I. 10-gauge wire has a larger diameter than 16-gauge wire.
II. Gold has a higher resistivity than tungsten.
III. Aluminum conducts electricity better than iron.

A. I only
B. II only
C. III only
D. I and III only

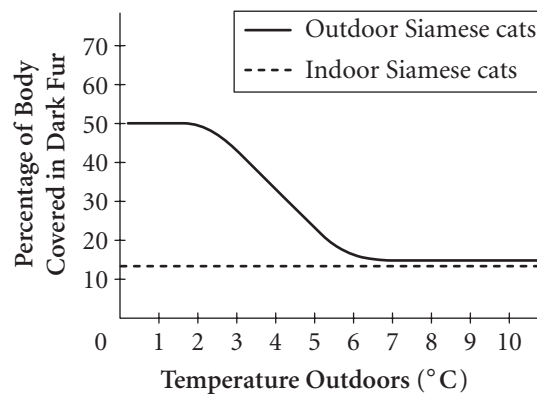
GO ON TO THE NEXT PAGE ➡

28. Which of the following graphs best represents the relationship between the resistivity of a tungsten wire and its length?



Passage VI

Siamese cats have a genotype for dark fur, but the enzymes that produce the dark coloring function best at temperatures below the cat's normal body temperature. A Siamese cat usually has darker fur on its ears, nose, paws, and tail, because these parts have a lower temperature than the rest of its body. If a Siamese cat spends more than one hour a day for six consecutive days outdoors (an "outdoor" cat) during very cold weather, darker fur grows in other places on its body. If a Siamese cat does not spend this amount of time outdoors, it is an "indoor" cat. The amount of dark fur on its body remains constant throughout the year.



GO ON TO THE NEXT PAGE ➡

29. A particular Siamese cat goes outdoors a total of 3 hours per week during the coldest part of the year. One could predict that the percentage of its body covered by dark fur would be closest to:
- A. 0%
 - B. 10%
 - C. 40%
 - D. 60%
30. According to the graph, what is the most likely temperature outside if outdoor Siamese cats have 45% of their bodies covered in dark fur?
- F. 0° C
 - G. 3° C
 - H. 6° C
 - J. 9° C
31. If a Siamese cat that lived indoors was lost and later found with dark fur over 30% of its body, which of the following could be inferred about the period during which it was missing:
- I. It was living in an area where temperatures fell below 5° C.
 - II. It spent more time outdoors than indoors.
 - III. It was missing for at least 6 days.
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II, and III
32. If a Siamese cat has dark fur over 10% of its body, which of the following must be true about the cat?
- F. It lives indoors.
 - G. It lives in an area where the temperature outdoors is usually 7° C or higher.
 - H. It either lives indoors or it lives in an area where the temperature outdoors is usually 7° C or higher.
 - J. None of the above
33. If a researcher wants to find out how fur color is affected by the amount of time a Siamese cat spends outside in cold weather, which experiment would be the most helpful?
- A. The "indoor" cats in the original experiment should be used as the control group and their fur color should be compared to a group of Siamese cats spending six hours or more a day outside in cold weather for six consecutive days.
 - B. A new group of Siamese cats should be formed and kept outside two or more hours a day at varying temperatures. Their fur color at different outdoor temperatures should be compared to the "outdoor" cats already charted.
 - C. Siamese cats should be split into two groups, one group spending only one hour per day outside for six consecutive days in cold weather, and the other group spending at least two hours a day outside for six consecutive days in the same weather.
 - D. No new experiment is needed. The data already gathered shows that the more time a Siamese cat spends outside in cold weather, the darker its fur will be.

Passage VII

Bovine spongiform encephalopathy (BSE) is caused by an unconventional pseudovirus that eventually kills infected cattle. BSE is diagnosed post mortem from the diseased cavities that appear in brain tissue, and is associated with the use in cattle feed of ground-up meat from scrapie-infected sheep. A series of experiments was performed to determine the mode of transmission of BSE. The results are given in the table below.

Experiment 1

60 healthy cows were divided into two equal groups. Group A's feed included meat from scrapie-free sheep; and Group B's feed included meat from scrapie-infected sheep. 18 months later, the two groups were slaughtered and their brains examined for BSE cavities.

Experiment 2

Researchers injected ground-up sheep brains directly into the brains of two groups of 30 healthy cows. The cows in Group C received brains from scrapie-free sheep. The cows in Group D received brains from scrapie-infected sheep. 18 months later, both groups were slaughtered and their brains examined for diseased cavities.

GO ON TO THE NEXT PAGE ➡

Group	Mode of transmission	Scrapie present	Number of cows
A	feed	no	1
B	feed	yes	12
C	injection	no	0
D	injection	yes	3

*As determined visually by presence/absence of spongiform encephalopathy

34. Which of the following hypotheses was investigated in Experiment 1?
- F. The injection of scrapie-infected sheep brains into cows' brains causes BSE.
 - G. The ingestion of wild grasses causes BSE.
 - H. The ingestion of scrapie-infected sheep meat causes scrapie.
 - J. The ingestion of scrapie-infected sheep meat causes BSE.
35. What is the purpose of Experiment 2?
- A. To determine whether BSE can be transmitted by injection
 - B. To determine whether BSE can be transmitted by ingestion
 - C. To determine whether ingestion or injection is the primary mode of BSE transmission
 - D. To determine the healthiest diet for cows
36. Which of the following assumptions is made by the researchers in Experiments 1 and 2?
- F. Cows do not suffer from scrapie.
 - G. A year and a half is a sufficient amount of time for BSE to develop in a cow.
 - H. Cows and sheep suffer from the same diseases.
 - J. Cows that eat scrapie-free sheep meat will not develop BSE.
37. A researcher wishes to determine whether BSE can be transmitted through scrapie-infected goats. Which of the following experiments would best test this?
- A. Repeating Experiment 1, using a mixture of sheep and goat meat in Group C's feed
 - B. Repeating Experiments 1 and 2, replacing sheep with healthy goats
 - C. Repeating Experiments 1 and 2, replacing healthy sheep with healthy goats and scrapie-infected sheep with scrapie-infected goats
 - D. Repeating Experiment 2, replacing healthy cows with healthy goats
38. What is the control group in Experiment 1?
- F. Group A
 - G. Group B
 - H. Group C
 - J. Group D
39. Which of the following conclusions is (are) supported by the experiments?
- I. Cows that are exposed to scrapie-infected sheep are more likely to develop BSE than cows that are not.
 - II. BSE is only transmitted by eating scrapie-infected sheep meat.
 - III. A cow that eats scrapie-infected sheep meat is more likely to develop BSE than a cow that is injected with scrapie-infected sheep brains.
- A. II only
 - B. III only
 - C. I and III only
 - D. II and III only
40. Which of the following statements is consistent with the results of Experiment 1?
- F. All cows that are fed scrapie-infected sheep meat develop BSE.
 - G. All cows that are injected with scrapie-infected sheep brains develop BSE.
 - H. Some cows that are fed scrapie-infected sheep meat develop BSE.
 - J. Some cows that are injected with scrapie-infected sheep brains develop BSE.

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT TURN TO ANY OTHER SECTION IN THE TEST.

STOP

ACT

Answers and Explanations
Practice Test 1

Copyright © 2002 by Kaplan, Inc.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the written permission of the Publisher, except where permitted by law.

Kaplan® is a registered trademark of Kaplan, Inc.

ENGLISH TEST

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

Passage I

1. (C)

(C) is the correct and most concise answer choice. (A) uses an unnecessary comma. (B) is unnecessarily wordy. (D) is redundant—if the societies created the legends, there is no need to describe the legends as original.

2. (F)

The question stem gives an important clue to the best answer: the purpose of the inserted sentence is “to describe the different kinds” of stories. (F) is the only choice that does this. (G) explains how the stories were told. (H) explains why more is not known about the stories. (J) describes the length of some stories.

3. (D)

Answer choices (A), (B), and (C) create run-on sentences. (D) describes a relationship between our “many more permanent ways of handing down our beliefs” and the fact that “we continue to create and tell legends” that makes sense. It also creates a complete sentence.

4. (F)

Answer choices (G), (H), and (J) are unnecessarily wordy.

5. (D)

In addition to other problems, answer choices (A), (B), and (C) are redundant or unnecessarily wordy. Because the contrasting word *but* is already used, *however* is repetitive and should be eliminated.

6. (G)

Answer choices (F), (H), and (J) are all redundant. The word *conclusion* is unnecessary because it expresses the same thing as the word *ending*, which has already been used.

7. (B)

(B) is the only choice that stays consistent with the verb tense established by *knew* and *decided*.

8. (J)

(F) creates a run-on sentence and also makes it seem that the hunter, not the deer, “was only temporarily knocked unconscious by the car.” (G) and (H) use incorrect verb tenses.

9. (A)

(B) is incorrect because the words preceding the semicolon could not be a complete sentence on their own. (C) would create a sentence fragment. (D) would create a run-on sentence.

10. (J)

Regardless of the sequence of the words, the information provided in choices (F), (G), and (H) is irrelevant to the passage’s topic of urban legends.

11. (C)

The subject of the sentence is *One*, so the verb must be singular. (B) and (D) use incorrect verb tenses.

12. (G)

(F) creates a sentence that does not make sense. (H) and (J) use the plural *women* instead of the singular *woman*.

13. (B)

(B) most clearly expresses the idea that several websites research “the validity of commonly told urban legends.” Because this information is relevant to the topic of urban legends, “OMIT the underlined portion” is not the best answer.

14. (H)

Paragraph 3 describes an urban legend that is “humorous in nature.” Paragraph 4 describes a rather frightening legend: alligators living underneath the city in the sewer system. The sentence “Other urban legends seem to be designed to instill fear” is an appropriate topic sentence for Paragraph 4, and it also serves as a needed transition between Paragraph 3 and Paragraph 4.

15. (C)

Although the third and fourth sentences of Paragraph 1 provide some general information about the purpose and topics of the myths and legends of primitive societies, no specifics are given. This makes (C) the best answer.

Passage II**16. (H)**

The choices here would be *do you* or *does one*. The latter appears as an answer choice.

17. (B)

(A) incorrectly uses a colon. (C) and (D) are grammatically incorrect.

18. (G)

Solitary and *alone* are redundant in the same sentence. (H) and (J) also have redundancy.

19. (A)

The underlined portion is clearest the way it is written.

20. (J)

The colon is incorrect, so eliminate (F) and (H). Because it is a compound sentence, a comma is needed before *and*.

21. (B)

In fact is nonessential—it should be set off by commas.

22. (G)

American (an adjective) is the word being modified. Therefore, the adverb form of *unique* is needed.

23. (D)

Near Walden Pond ... is a long sentence fragment. The best way to fix the error is to simply combine the sentences.

24. (J)

This paragraph and the ones that immediately follow outline Thoreau's life. His influence on the people of today is not discussed until the end of the essay. Therefore, the underlined sentence does not belong.

25. (C)

Sentence 3 comes immediately after Sentence 1. (C) is the only choice that lists it this way.

26. (F)

There are two independent clauses on both sides of the semicolon, so the sentence is punctuated correctly. (G) needs a comma before *and*. (H) is incorrect because the second half of the sentence is not an independent clause. (J) does not make sense.

27. (A)

A possessive pronoun is needed because the works belong to Thoreau. Eliminate (B) and (D). (C) relates to more than one person, so it is incorrect as well.

28. (J)

This paragraph is all about what Thoreau means to us today.

29. (B)

(A), (C), and (D) are excessively wordy.

30. (G)

The use of questions forces the reader to think about the answers. (F) is too literal, and (J) is too broad for the topic of the essay. (H) is incorrect because the author establishes the quality of Thoreau's work.

Passage III**31. (D)**

Because the word *live* is used later in the sentence, (A), (B), and (C) contain redundant information.

32. (H)

In this sentence, the *its* must be possessive because the *unique anatomy* belongs to the sloth. The word describing *anatomy* must be an adjective, not an adverb.

33. (A)

The comma is correctly used in (A) to separate the nonessential descriptive phrase *about the size of a large domestic cat* from the rest of the sentence.

34. (H)

The information about the sloth's limbs is relevant to the topic, so it should not be omitted. (H) makes the most sense in the context of the passage.

35. (D)

Adapted needs to be modified by an adverb, so (D) is the best answer choice.

36. (G)

Instead describes the right relationship between the two sentences. The pronouns must be consistent, and since *its* is already used in the sentence, (G) is the best answer choice.

37. (D)

(D) is the only choice that correctly describes the relationship between the sloth's inability to "move swiftly on the ground" and its ability to swim.

38. (G)

(G) connects the sloth's unique characteristics discussed in Paragraph 3 with the description of its flexibility in Paragraph 4.

39. (D)

(D) correctly uses the second comma necessary to separate the phrase *without moving the rest of its body* from the rest of the sentence. (C) can be eliminated because it is unnecessarily wordy.

40. (J)

(J) is the only choice that contains a consistent verb tense.

41. (D)

(A) and (B) contain redundant information. (C) uses an incorrect form of the verb.

42. (J)

This information about the howler monkey is irrelevant to the topic of the passage.

43. (B)

(A) creates a sentence fragment. (C) is unnecessarily wordy and awkward. (D) creates a run-on sentence.

44. (G)

The last sentence serves as a conclusion for the entire passage, and removing it would make the ending more abrupt.

45. (C)

The description of the sloth's "camouflage" is in Paragraph 5.

Passage IV

46. (F)

The underlined portion is best left as is. The other answer choices make the sentence unnecessarily wordy. (Style)

47. (B)

The verb tense must agree with the tense that has been established up to this point. The passage is in past tense, so the past tense choice (B) is correct. (Conventions)

48. (H)

Like the question before, the simple past tense is correct. (Conventions)

49. (C)

(A) creates a sentence fragment and uses an incorrect verb tense. (B) also uses the wrong verb tense. (D) incorrectly uses a semicolon, as the words preceding the semicolon do not constitute an independent clause. (Conventions)

50. (H)

In the context of the rest of the passage, only (H) makes sense. The fire fighters' attempts to extinguish the flames failed; only nature could stop the fire with the first snow fall. (Style)

51. (D)

(A) and (B) are unnecessarily wordy and awkward. (C) creates a run-on sentence. (Style)

52. (J)

All of the other answer choices are unnecessarily wordy and/or repetitive. (Style)

53. (C)

From the word *open*, you can determine that the best answer will contain *cones*. This makes (C) the only possible answer, as the apostrophe is incorrectly used in (B). (Conventions)

54. (H)

This is the only answer choice that makes sense in the context of the passage. The sighting of the large animals near burning forests is used as evidence that the animals of the region were "fire-tolerant and fire-adaptive." (Style)

55. (D)

The comma in (A) is unnecessary because the sentence has a list of only two examples, not three. The semicolon in (B) is incorrectly used because *and bedding down* does not begin an independent clause. The colon in (C) is incorrectly used because it is not being used to introduce or emphasize information. (Conventions)

56. (H)

(F) and (G) use the wrong word form of *judge*, and (J) is very awkward. (Style)

57. (A)

The pronoun refers to *forest*. (Conventions)

58. (H)

The introduction of information about fires in Alaska is unwarranted, so (F) and (G) can be eliminated. (J) is incorrect because the additional information would actually uphold the author's position as an authority. (Organization)

59. (D)

The reports mentioned in (D) would substantiate the author's claims much more so than any of the other answer choices. (Organization)

Passage V

60. (H)

(F) creates a sentence fragment, and (G) incorrectly uses a plural verb with a singular subject. The context of the paragraph makes (H) a better choice than (J).

61. (D)

The final part of the sentence, "...and there are many other rivers in America as well," is completely irrelevant to the rest of the sentence and the paragraph in which the author discusses white water rafting and the rivers she's rafted.

62. (J)

The phrase *on the Deschutes River* is essential information and, therefore, should not be set off by a comma. (G) and (H) incorrectly use the colon and semicolon, respectively.

63. (C)

(A) and (D) create sentence fragments, and (B) is extremely awkward.

64. (J)

This sentence is irrelevant to the topic of the passage.

65. (D)

This sentence makes it sound as though the author was roaring, not the rapids; *roaring* is a misplaced modifier. (B) doesn't fix the problem because the reader has no idea what *it* refers to. (D) is the clearest choice.

66. (J)

The word *churn* must either be in past tense, or the structure of the sentence must change. (J) does the latter.

67. (B)

(B) is the simplest, most concise way of expressing the idea. Replacing *and instead he adopted* with *with* makes the sentence much less awkward.

68. (F)

(G) and (J) make it sound as though the author is in the water. (F) expresses the idea better than (H).

69. (D)

The phrase *and we stopped* is redundant because *we came to a jarring halt* says the same thing much more expressively. Omit the underlined portion.

70. (F)

It was is fine here because the author is telling her story in the past tense. (G) and (H) are the present tense, and (J) incorrectly introduces the possessive form.

71. (D)

The other answer choices are unnecessarily wordy; the simplest choice is the best.

72. (G)

The participle *receiving* has to be changed into a verb in the past tense, *received*, in order to be consistent with *went*. (G) is correct as opposed to (H) because the number of bruises something has can be counted, which necessitates *many bruises*, not *much bruises*.

73. (B)

(A) wouldn't work as a concluding sentence because its style and tone are off; nowhere in the passage does the writer use language such as *brutal calamities* and *beguiling excitement*. Also, the writer and her father were not "unwary rafters." (C) contradicts the writer's main theme that nothing was as memorable as her first ride through the rapids. The tone in (D), "call me whacky or weird..." is much different from the writer's. (B) is the choice that closely matches the author's style and tone while restating the main theme of the passage.

74. (F)

This essay relates a personal experience of the writer: her first time rafting down the rapids. There is very little mention of the techniques of white water rafting, so the essay would not meet the requirements of the assignment. (G) is wrong because the essay does not focus on the relationship between father and daughter, but on their first rafting experience together.

75. (B)

The sentence is a preface of things to come, so it must appear towards the beginning of the essay. That eliminates (C) and (D). The second paragraph is about the peaceful setting, so (B) is the most sensible answer.

MATH TEST

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

1. (D)

You know that 14 people are 20% of the total, and you need to find 100% of the total. You could set up an equation, or you could multiply by 5, since 100% is 5 times as much as 20%.

2. (J)

One safe way to answer this question is by picking numbers. For instance, if you let $x = 2$ and $y = 3$, the train would have traveled $90 \times 2 + 60 \times 3 = 360$ miles in 5 hours, or $\frac{360}{5} = 72$ miles per hour. If you then plug $x = 2$ and $y = 3$ into the answer choices looking for 72, it's clear that the correct answer is (J).

3. (D)

If the ratio of men to women is 5:3, then the ratio of women to the total is 3:8. Since you know the total number of string players is 24, you can set up the equation $\frac{3}{8} = \frac{x}{24}$ to find that $x = 9$. Also, without setting up the proportion, you could note that the total number of players is 3 times the ratio total, so the number of women will be 3 times the part of the ratio that represents women.

4. (K)

In a pinch you could backsolve on this question, but this one is fairly easy to solve algebraically, like so:

$$x^2 - 3x = 6x$$

$$x^2 = 9x$$

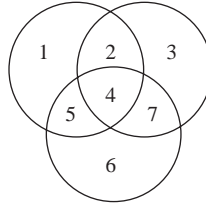
Now you can divide both sides by x because $x \neq 0$:

$$\frac{x^2}{x} = \frac{9x}{x}$$

$$x = 9$$

5. (C)

With visual perception problems such as this one, the key is to play around with possibilities as you try to draw a solution. Eventually, you should be able to come up with a picture like this:

**6. (K)**

This problem could be solved algebraically, but look at the answer choices. They are all simple numbers, making this a great opportunity for backsolving. Begin with choice (H).

Plugging in 0, you get:

$$(0)^2 + 6(0) + 8 = 4 + 10(0)$$

$$8 = 4$$

Since 8 does not equal 4, you know this isn't the correct answer. But it is difficult to know which answer to try next. Should you aim higher or lower? If you're unsure of which direction to go, just try whatever looks easiest. Choice (J), 1, looks like a good candidate:

$$(1)^2 + 6(1) + 8 = 4 + 10(1)$$

$$1 + 6 + 8 = 4 + 10$$

$$15 = 14$$

So (J) doesn't work either, but it looks like the numbers are getting closer so you're going in the right direction. Try out choice (K) just to be sure.

$$(2)^2 + 6(2) + 8 = 4 + 10(2)$$

$$4 + 12 + 8 = 4 + 20$$

$$24 = 24$$

Choice (K) is the correct answer.

7. (B)

Translate piece by piece:

"Nine less than c " indicates subtraction: $c - 9$.

"Nine less than c is the same as the number d ": $c - 9 = d$. There's one equation.

" d less than" also indicates subtraction: $-d$.

" d less than twice c is 20": $2c - d = 20$. There's the second equation.

Choice (B) matches what we found.

8. (K)

To determine the total number of possible arrangements on a question like this one, simply determine the number of possibilities for each component, and then multiply them together. There are 3 types of appetizers, 5 types of entrees, and 4 types of desserts. Therefore there are $3 \times 5 \times 4 = 60$ ways to order a dinner, and choice (K) is correct.

9. (E)

Backsolving is a great technique to use for this problem. Start with (C). The director asked 1 out of 3 students to come to the second audition and $\frac{1}{3}$ of 48 is 16, so 16 students were invited to a second audition. Then 75% of 16, which is $\frac{3}{4}(16) = 12$ students were offered parts. The question states that 18 students were offered parts, so you already know that (C) is too small. You can also eliminate (A) and (B). Since the director invited $\frac{1}{3}$ of the students to a second audition, the number of students at the first audition must be divisible by 3. (You can't have a fraction of a student.) That eliminates (D), which leaves only (E).

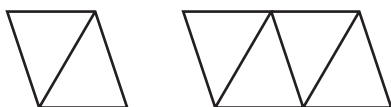
10. (K)

Begin by translating the English into math: $x + 5x = -60$, $6x = -60$, so $x = -10$, and the two numbers are -10 and -50 . Thus the lesser number is -50 .

By the way, this is where most people mess up. They forget that the “lesser” of two negative numbers is the negative number with the larger absolute value (since *less* means *to the left of* on the number line):

**11. (D)**

You're looking for the total number of parallelograms that can be found among the triangles, and parallelograms could be formed two ways from these triangles, either from two adjacent triangles, or from four adjacent triangles, like so:



Begin by looking for the smaller parallelograms. If you look for parallelograms leaning in the same direction as the one we drew, you'll find three. But there are two other possible orientations for the smaller parallelogram: It could be flipped horizontally, or it could be rotated 90 degrees so that one triangle sits atop the other in the form of a diamond. Both of these orientations also have three parallelograms, for a total of nine smaller parallelograms.

Now look for larger parallelograms. Perhaps the easiest way to count these is to look along the sides of the larger composite triangle. You should be able to spot two of the larger parallelograms along each side, one originating at each vertex, for a total of six larger parallelograms. Thus there are a total of $9 + 6 = 15$ parallelograms in all.

12. (H)

The square has a perimeter of 16 inches, so each side of the square is 4 inches, and the area of the square is, therefore, 16 square inches. If the side of the square is 4 inches, then the diameter of the circle is also 4 inches. The radius of the circle is 2 inches. The area of the circle is 4π square inches. The sum of the areas of the four shaded regions is then $16 - 4\pi$ square inches.

13. (C)

On questions such as this one, the safest strategy is simply to list the possibilities. It's also helpful to realize that multiples of both 4 and 6 are multiples of 12 (the least common multiple between the two), so skip over all multiples of 12:

4, 8, ~~12~~, 16, 20, ~~24~~, 28, 32, ~~36~~, 40, 44, ~~48~~

So there are 8 in all.

14. (H)

Don't be intimidated by the expression $f(x)$. In this case, that just means that you should plug in the number that appears in the parentheses for the x in the expression they have given you. So, if $f(x) = (8 - 3x)(x^2 - 2x - 15)$, $f(3) = (8 - 3(3))((3)^2 - 2(3) - 15)$. Once you get to this point, just remember PEMDAS. $(8 - 3(3))((3)^2 - 2(3) - 15) = (8 - 9)(9 - 6 - 15) = (-1)(-12) = 12$, choice (H).

15. (C)

A class contains five juniors and five seniors. If one member of the class is assigned at random to present a paper on a certain subject, and another member of the class is randomly assigned to assist him, then:

The probability that the first student picked will be a junior = $\frac{\text{\# of Juniors}}{\text{Total \# of Students}} = \frac{5}{10} = \frac{1}{2}$

The probability that the 2nd student picked will be a junior = $\frac{\text{\# of Juniors Remaining}}{\text{Total \# of Students Remaining}} = \frac{4}{9}$

So the probability that both students will be juniors = $\frac{1}{2} \times \frac{4}{9} = \frac{2}{9}$

16. (G)

Since the formula to find the area of a triangle is $\frac{1}{2}(\text{base})(\text{height})$, you can plug in the base and area to find the height. You know that the area of this triangle is 45 units and that the base is $3 + 12 = 15$. Let x be the length of altitude \overline{YS} . Plug these into the area formula to get $45 = \frac{15x}{2}$. Solve for x to get $x = 6$.

17. (D)

The y -coordinate is the point on which the x value is zero, so plug $x = 0$ into the equation:

$$6y - 3(0) = 18$$

$$6y = 18$$

$$y = 3$$

18. (H)

This question involves common quadratics, so the key is to write these quadratic expressions in their other forms. For instance $x^2 - y^2 = 12$, so $(x + y)(x - y) = 12$. Since $x - y = 4$, $(x + y)(4) = 12$, so $x + y = 3$. Finally, $x^2 + 2xy + y^2 = (x + y)^2 = (3)^2 = 9$.

19. (D)

This shape must be divided into 3 simple shapes. By drawing lines perpendicular to the line that is 10 units long, you are left with a 3×10 rectangle, a triangle with a base of 4 and a height of 3, and a triangle with a base of 7 and a hypotenuse of $7\sqrt{2}$. The rectangle has an area of $3 \times 10 = 30$ square units. The smaller triangle has an area of $\frac{4 \times 3}{2} = 6$ square units. The larger triangle is a 45-45-90 triangle, so the height must be 7. Therefore, it has an area of $\frac{7 \times 7}{2}$ square units. The entire shape has an area of $6 + 30 + 24.5 = 60.5$ square units.

20. (H)

Although backsolving is certainly possible with this problem, it's probably quicker to solve with arithmetic. The board is 12 feet long, which means it is $12 \times 12 = 144$ inches. The carpenter cuts off $3 \times 17 = 51$ inches. That leaves $144 - 51 = 93$ inches.

21. (E)

To answer this question, begin by setting the right side of equation to equal zero:

$$x^2 - 4x - 6 = 6$$

$$x^2 - 4x - 12 = 0$$

Now use reverse-FOIL to factor the left side of the equation:

$$(x - 6)(x + 2) = 0$$

Thus either $x - 6 = 0$ or $x + 2 = 0$, so $x = 6$ or -2 .

22. (H)

If -3 is a solution for the equation, then the equation is true when $x = -3$. Substitute -3 for x in the equation and you get $(-3)^2 + (-3)k - 15 = 0$, or $9 - 3k - 15 = 0$. That simplifies to $-3k = 6$, so if the equation is true, then $k = -2$.

Alternatively, you could reason like this: If -3 is a solution, then $(x + 3)$ must be a factor of the polynomial. As the polynomial ends with the term -15 , the other factor must be $(x - 5)$. Multiplying $(x + 3)(x - 5)$ gives you $x^2 - 2x - 15$, and k must be -2 .

23. (D)

To solve this problem you need to understand the triangle inequality theorem, which states: The sum of the lengths of any two sides of a triangle is always greater than the length of the third side. Therefore, the other sides of this triangle must add up to more than 7. You know from the problem that every side must be an integer. That means that the sides must add up to at least 8 inches (4 inches and 4 inches, or 7 inches and 1 inch, for example).

24. (F)

It's time to use SOHCAHTOA, and drawing a triangle might help, as well. If sine (opposite side over hypotenuse) θ is $\frac{\sqrt{11}}{2\sqrt{3}}$, then one of the legs of the right triangle is $\sqrt{11}$ and the hypotenuse is $2\sqrt{3}$. Now apply the Pythagorean theorem to come up with the other (or adjacent) leg: $(\sqrt{11})^2 + (n)^2 = (2\sqrt{3})^2$, so $11 + n^2 = 12$, so $11 + n^2 = 12$, which means that $n^2 = 1$, and $n = 1$. Thus cosine (adjacent side over hypotenuse) θ is $\frac{1}{2\sqrt{3}}$.

25. (D)

Take a quick look at the answer choices before simplifying an expression like this one. Notice that none of these choices contain a radical sign in their denominators. So when you simplify the expression, try to eliminate that radical sign. Your calculations should look something like this:

$$\frac{\sqrt{3+x}}{\sqrt{3-x}} \times \frac{\sqrt{3-x}}{\sqrt{3-x}} = \frac{\sqrt{(3+x)(3-x)}}{\sqrt{(3-x)^2}} = \frac{\sqrt{9-3x+3x-x^2}}{3-x} = \frac{\sqrt{9-x^2}}{3-x}. \text{ So choice (D) is correct.}$$

26. (G)

If the ratio of the parts is 2:5, then the ratio total is $2 + 5 = 7$. Thus the actual total number of cookies must be a multiple of 7. The only answer choice that's a multiple of 7 is (G), 35.

27. (C)

This question is a great opportunity to use your calculator. Notice that all your answer choices are decimals. In order to solve, convert $\frac{3}{16}$ into a decimal and add that to .175. $\frac{3}{16} = .1875$, so the sum equals $.1875 + .175 = .3625$. So choice (C) is correct.

28. (H)

Remember that if you are given a perimeter for a rectangle, the rectangle with the greatest area for that perimeter will be a square. So we are looking for the area of a square with a perimeter of 20. The perimeter of a square equals $4s$, where s is the length of one side of the square. If $4s = 20$, then $s = 5$. The area of the square equals $s^2 = 5^2 = 25$, choice (H).

29. (B)

Be careful on this one. You can't start plugging numbers into your calculator without paying attention to the order of operations. This one is best solved on your own.

$$\frac{\frac{3}{2} + \frac{7}{4}}{\left(\frac{15}{8} - \frac{3}{4}\right) - \left(\frac{4+3}{-4+3}\right)} = \frac{\frac{3}{2} + \frac{7}{4}}{\left(\frac{9}{8}\right) - \left(\frac{7}{-1}\right)} = \frac{\frac{13}{4}}{\frac{9}{8} + \frac{7}{1}} = \frac{\frac{13}{4}}{\frac{65}{8}} = \frac{13}{4} \times \frac{8}{65} = \frac{2}{5}$$

30. (K)

You could solve this algebraically for x as follows:

$$x - 15 = 7 - 5(x - 4)$$

$$x - 15 = 7 - 5x + 20$$

$$x - 15 = -5x + 27$$

$$6x = 42$$

$$x = 7$$

Remember also that if you are ever stuck, you can try to backsolve with the answer choices. Here if you try them all out, only 7 works:

$$7 - 15 = 7 - 5(7 - 4)$$

$$-8 = 7 - 5(3)$$

$$-8 = 7 - 15$$

$$-8 = -8$$

31. (C)

Break strange figures like this one up into shapes that are more familiar and easier to handle. In this case, the quadrilateral can be split into a square and a right triangle. The square is 9×9 , so the area of that part of the figure is 81 square meters. The right triangle has a height of 9 and a base of 4, so the area of the triangle would be $\frac{1}{2}bh = \frac{1}{2}(4 \times 9) = \frac{1}{2}(36) = 18$ square meters. So the total area of the figure is $(81 + 18)$ square meters = 99 square meters, choice (C).

32. (H)

The easiest way to solve this question is to put it in the form $y = mx + b$, in which case m equals the slope. In other words, you want to isolate y :

$$6y - 3x = 18$$

$$6y = 3x + 18$$

$$y = \frac{3x + 18}{6}$$

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

So the slope equals $\frac{1}{2}$.

33. (E)

To answer this question you have to know that that perpendicular lines on the standard (x, y) coordinate plane are negative reciprocals of each other. In other words, the line described by the equation $y = -\frac{4}{5}x + 6$ has a slope of $-\frac{4}{5}$, so a line perpendicular to it has a slope of $\frac{5}{4}$. Looking at the answer choices, you can immediately eliminate (B), (C), and (D). Now just plug in the coordinates you're given, $(4, 3)$, into one of the remaining equations. Let's try choice (A):

$$3 = \frac{5}{4}(4) + 2$$

$$3 = 5 + 2$$

This does not compute, so the answer must be (E). (Try it out if you're not convinced.)

34. (K)

Since the problem gives you the y -intercept, it is easy to look at the answer choices and rule out (F), (H), and (J). Put the equation from the question in slope-intercept form to find its slope:

$$3x - 5y = 4$$

$$-5y = -3x + 4$$

$$y = \frac{-3x + 4}{-5}$$

$$y = \frac{3}{5}x - \frac{4}{5}$$

Since line t is parallel, it has the same slope. This matches (K).

35. (A)

To solve for x in the equation $y = mx + b$, isolate x on one side of the equation. Begin by subtracting b from both sides. You will be left with $y - b = mx$. Then divide both sides by m , and you will be left with $x = \frac{y-b}{m}$, choice (A).

36. (J)

In this figure there are many right triangles, and many similar triangles. If you know to be on the lookout for 3-4-5 triangles, it should be easy to spot that triangle ABC has sides of 15-20-25, so \overline{AC} is 25. Now turn your attention to triangle ABD . Since it's a right triangle that shares $\angle BAC$ with triangle ABC , it too must be a 3-4-5 triangle. So if the hypotenuse is 20, the shorter leg (\overline{BD}) must have a length of 12, and the longer leg (\overline{AD}) must have a length of 16.

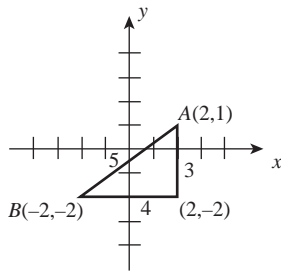
37. (A)

The shortest distance to line m will be a line perpendicular to m . So, the distance will be the difference between the y -coordinates of point C and the nearest point on line m . Since every point on m has a y -coordinate of 5, and point C has a y -coordinate of 3, the difference is 2.

38. (G)

Perhaps the easiest approach here is to pick numbers. Pick a simple number such as $x = 2$. Thus $\frac{x^2 - 11x + 24}{8 - x} = \frac{(2)^2 - 11(2) + 24}{8 - 2} = \frac{4 - 22 + 24}{6} = \frac{6}{6} = 1$. So 1 is your target number. When you plug $x = 2$ into the answer choices, the only choice that gives you 1 is (G).

39. (C)



It may help you to draw a picture. Draw a right triangle into the coordinate plane as we've done above. Note that the distance between the two points represents the hypotenuse of the triangle. The legs of the triangle have lengths of 3 and 4, so the distance between the two points must be 5, choice (C).

40. (G)

To find the area of the shaded region, you must subtract the area of the circle from the area of the rectangle. Since the sides of the rectangle are $2x$ and $5x$, it has an area of $2x \cdot 5x = 10x^2$. By examining the diagram, you can see that the circle has a diameter of $2x$, so it has a radius of x . Its area is, therefore, πx^2 . The shaded region, therefore, has an area of $10x^2 - \pi x^2$.

41. (B)

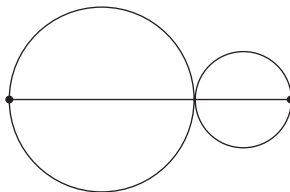
Since you are not given a diagram for this problem, it's best to draw a quick sketch of a right triangle to help keep the sides separate in your mind. Mark one of the acute angles θ . Since $\cos \theta = \frac{5\sqrt{2}}{8}$, mark the adjacent side $5\sqrt{2}$ and the hypotenuse as 8. (Remember SOHCAHTOA.) Use the Pythagorean theorem to find that the side opposite θ is $\sqrt{14}$. The problem asks you to find $\tan \theta$. Tangent = $\frac{\text{opposite}}{\text{adjacent}}$, so $\tan \theta = \frac{\sqrt{14}}{5\sqrt{2}}$, which can be simplified to $\frac{\sqrt{7}}{5}$.

42. (H)

This question is one where your calculator can come in handy. Divide 7 by integer values for n , and look for values between .5 and .8. Begin by looking for the integer values of n where $\frac{7}{n}$ is greater than .5. If $n = 14$, then $\frac{7}{n} = .5$, so n must be less than 14. Work through values of n until you get to the point where $\frac{7}{n} \geq .8$. When $n = 9$, $\frac{7}{n} = .778$, but when $n = 8$, $\frac{7}{n} = .875$. So the integer values that work for n in this case are $n = 9, 10, 11, 12$, and 13. Five integer values work, so choice (H) is correct.

43. (C)

The points are as far apart as possible when separated by a diameter of X and a diameter of Y .



The circumference of a circle is $\pi \times (\text{diameter})$, so the diameter of circle X is 12 and the diameter of circle Y is 8. The greatest possible distance between points then is $12 + 8 = 20$.

44. (K)

Begin by getting rid of the square root sign. If $y \geq 0$, then $\sqrt{y^2} = y$, so $\sqrt{(x^2 + 4)^2} = x^2 + 4$. $(x + 2)(x - 2) = x^2 - 4$, so you now have $(x^2 + 4) - (x^2 - 4) = ?$ Get rid of the parentheses and you have $x^2 + 4 - x^2 + 4 = x^2 - x^2 + 4 + 4 = 8$.

45. (A)

Here you need to substitute -3 for s and solve. That gives you the expression $(-3)^3 + 2(-3)^2 + 2(-3)$, which equals $-27 + 18 - 6$, or -15 . If you missed this problem, you probably made a mistake with the signs of the numbers.

46. (G)

Be careful on this one. Begin by simplifying the equation by FOILING one side:

$$2x + 6 = (x + 5)(x + 3)$$

$$2x + 6 = x^2 + 8x + 15$$

Then get the right side of the equation to equal zero: $x^2 + 6x + 9 = 0$.

The left side of this equation is the perfect square $(x + 3)^2$, so $(x + 3)^2 = 0$, which has only one solution, $x = -3$. Choice (G) is correct.

47. (E)

This is a great eyeballing question. The perimeter is greater than AC , so you can get rid of choices (A) and (B). It appears to be quite a bit greater than AC , more than twice as great, so choices (C) and (D) are out as well. That only leaves choice (E).

If you wanted to solve this the conventional way, since the perimeter is the sum of the lengths of all the sides of the square, you need to find the length of the square's sides. Let the length of each of the square's sides be x . AC divides the square into two right triangles, so we can apply the Pythagorean theorem: $AB^2 + BC^2 = AC^2$. Since AB and BC are sides of the square, they have the same length. We can write that as $x^2 + x^2 = AC^2$. $AC = 8$, so $2x^2 = 8^2$; $2x^2 = 64$; $x^2 = 32$; $x = \sqrt{32} = \sqrt{16 \times 2} = 4\sqrt{2}$. So each side of the square is $4\sqrt{2}$, and the perimeter of the square is $4 \times 4\sqrt{2} = 16\sqrt{2}$.

48. (G)

To find the area of this complex shape, you could divide it into 2 simple shapes by drawing a line 30 inches up, parallel to the horizontal base. This leaves you with a 4×30 rectangle and a triangle with a height of 6 and a base of 4. The rectangle has an area of $4 \times 30 = 120$ square inches, and the triangle has an area of $\frac{4 \times 6}{2} = 12$ square inches. That makes a total of $120 + 12 = 132$ square inches.

49. (E)

Drawing \overline{OD} divides quadrilateral $OCDE$ into two triangles, OCD and ODE . Both triangles are isosceles because \overline{OC} , \overline{OD} , and \overline{OE} are all radii of circle O . Angles ODC and OCD have equal measures, since they're opposite equal sides, so $\angle ODC$ measures 70° . Similarly, $\angle ODE$ measures 45° . Together, angles ODC and ODE make up $\angle CDE$, so its measure is $70^\circ + 45^\circ = 115^\circ$.

50. (K)

Remember that lines intersect at the point that is a solution to both equations. So, equations with no common solution don't intersect—they have the same slope and are parallel. To solve this problem, search through the answer choices to find the pair of equations representing lines with the same slope. If you write the equations in (K) in slope-intercept form, you'll get $y = -\frac{1}{3}x + 2$, $y = -\frac{1}{3}x + \frac{7}{9}$, so the slope is clearly the same for both equations.

51. (E)

To solve a repeating decimal question, begin by determining the pattern of the decimal on your calculator. $\frac{1}{7} = 0.142857142857 \dots$, so you know that this fraction repeats every 6 decimal places. Since we are looking for the 46th decimal place, we need to determine where in the 6-term pattern we would be at the 46th place. Divide 46 by 6, and look for the remainder. The remainder in this case is 4, so we are looking for the fourth term in the sequence, which is 8, choice (E).

52. (K)

Remember that you treat an inequality exactly like an equality, except that you need to flip the sign when you multiply or divide by a negative number. In this problem, you start with the inequality $-2 - 4x \leq -6x$. Add $4x$ to both sides to get $-2 \leq -2x$. Divide by -2 and flip the sign to get $1 \geq x$, which matches (K).

53. (B)

For this problem, it would probably be easiest to pick numbers. Since you will be taking the square root of the numbers, it's easiest to pick perfect squares, like 4 and 9. $\frac{\sqrt{4}}{4} + \frac{\sqrt{9}}{9} = \frac{2}{4} + \frac{3}{9} = \frac{1}{2} + \frac{1}{3} = \frac{5}{6}$. When you plug 4 and 9 into the answer choices, only (B) gives you $\frac{5}{6}$.

54. (G)

When transversals intersect parallel lines, corresponding line segments on the transversals are proportional. In other words, $\frac{\overline{DE}}{\overline{CB}} = \frac{\overline{EF}}{\overline{BA}}$. Thus $\frac{6}{8} = \frac{\overline{EF}}{4}$, so $\overline{EF} = 3$.

55. (D)

Divide the square into two right triangles by drawing the diagonal from (2, 7) to (2, 1). Remember that the area of each triangle is half its base times its height. Treat the diagonal as the base of a triangle. Its length is the distance from (2, 7) to (2, 1). Since the x -coordinates are the same, that distance is simply the difference between the y -coordinates. $7 - 1$, or 6. The diagonal bisects the square, so the height of the triangle is half the distance from (2, 7) to (2, 1). We already know that a diagonal of this square is 6, so half the distance is 3. Therefore, the base and height of either triangle are 6 and 3, so the area of each triangle is $\frac{6 \times 3}{2}$ or 9 square units. The square is made up of two such triangles and so has twice the area, or 18 square units.

56. (K)

Compared to the graph of $y = \cos \theta$, the graph of $y = 2 \cos \theta$ would have twice the amplitude and the same period, choice (K). Here you are doubling y , which represents the vertical coordinates, but the θ coordinates stay the same. The amplitude of a trigonometric equation refers to how high or low the curve moves from the horizontal axis. The period refers to the distance required to complete a single wave along the horizontal axis.

57. (C)

To solve this problem with algebra, you need to translate each phrase into mathematics. Translated, the problem is $3(x + 15) = 4x - 65$. Solve for x to get 110. Alternatively, you could backsolve.

58. (H)

The volume of a cylinder is $\pi r^2 h$, so pick numbers to make this question more concrete and plug them into this volume formula. Let's say the smaller cylinder has a height of 1 and a radius of 1 (diameter of 2), for a volume of $\pi 1^2 \times 1 = \pi$. The larger cylinder would then have a height of 3 and a radius of 2 (diameter of 4), for a volume of $\pi (2^2) \times 3 = 12\pi$. Thus it would take 12 fillings of the smaller cylinder to fill the larger cylinder.

59. (D)

Draw a picture of the triangle, and carefully apply your knowledge of the ratio of the lengths of the sides of a 30° - 60° - 90° triangle ($x : x\sqrt{3} : 2x$). So if the longer leg has a length of 12, the shorter leg has a length of $\frac{12}{\sqrt{3}} = \frac{12\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{12\sqrt{3}}{3} = 4\sqrt{3}$. Thus the hypotenuse is twice this, or $8\sqrt{3}$. So the perimeter is the sum of the three sides, or $4\sqrt{3} + 12 + 8\sqrt{3} = 12\sqrt{3} + 12$.

60. (J)

Remember the average formula on this one. The average formula states, $\text{Average} = \frac{\text{Sum of the terms}}{\text{Number of terms}}$. So to find the total average, find the total sum and divide it by the total number of terms. If a team averages x points in n games, then it scored nx points in n games. In the final game of the season, it scored y points. So the total sum of points for the season is $nx + y$, and the total number of games is $n + 1$. So the team's average score for the entire season is $\frac{nx + y}{n + 1}$, choice (J).

READING TEST

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

Passage I

1. (C)

The answer can be found in lines 25–29: “The real evils, indeed, of Emma’s situation were the power of having rather too much her own way, and a disposition to think a little too well of herself; these were the disadvantages which threatened alloy to her many enjoyments.”

2. (G)

Isabella’s name is given in line 60.

3. (B)

The answer can be found in line 17: “Between them it was more the intimacy of sisters.”

4. (F)

As it is used in the sentence, *disposition* means “tendency” or “inclination.” It would not make sense for Emma to have (G) control, (H) placement, or (J) transfer “to think a little too well of herself” (line 27).

5. (D)

The answer can be found in lines 51–57: “She recalled her past kindness—the kindness, the affection of sixteen years—how she had taught her and how she had devoted all her powers to attach and amuse her in health—and how she had nursed her through the various illnesses of childhood.”

6. (H)

Miss Taylor will continue to be a part of Emma’s life, but they will not be as close because Miss Taylor no longer lives with Emma and because Miss Taylor will be primarily concerned with her husband’s, not Emma’s, well-being.

7. (C)

Emma is self-centered, as evidenced by her description of her relationship with Miss Taylor. Among Miss Taylor’s admirable qualities, Emma includes the fact that Miss Taylor was “interested in her, in every pleasure, every scheme of hers—one to whom she could speak every thought as it arose, and who had such an affection for her as could never find fault” (lines 66–69). Emma is also clearly headstrong. She is described as “having rather too much her own way” (lines 26–27).

8. (G)

Emma's description of her friendship with Miss Taylor suggests that Emma most highly values devotion in her friends.

9. (B)

The description of Mr. Weston is in lines 44–47: "The marriage had every promise of happiness for her friend. Mr. Weston was a man of unexceptionable character, easy fortune, suitable age, and pleasant manners." None of the other choices match this description.

10. (H)

The answer to the question is in lines 23–25: "Emma doing just what she liked, highly esteeming Miss Taylor's judgment, but directed chiefly by her own."

Passage II**11. (C)**

The passage states that "just listing their race undermined the black students' performance" (lines 61–63). (C) is the best paraphrase of this information. Although both gender and racial stereotypes are discussed in the passage, there is no suggestion that one stereotype has more effect than another; this means you can eliminate (A). (D) can be eliminated for similar reasons: The passage describes an experiment using subliminal messages, but it does not compare the effectiveness of subliminal messages to the influence of racial stereotypes. (B) contradicts the research described in the passage.

12. (F)

The passage states that "you do not even have to believe a negative stereotype to be hurt by it" (lines 69–70). This makes (F) the best answer.

13. (A)

According to the passage, "When people are reminded of a negative stereotype about themselves...it can adversely affect performance" (lines 14–17). This suggests that one must be aware of the stereotype in order to be affected by it. (II) cannot be part of the best answer because participants in the study were not told about the true hypothesis of the study. (III) is not a part of the best answer because all participants in the study were undergraduates at the same university.

14. (G)

Rereading the whole referenced sentence should give you the answer. "What seems to happen is that as soon as you reach a tough par three or a difficult trig problem, the possibility of confirming, and being personally reduced to, a painful stereotype causes enough distress to impair performance" (lines 74–78). In other words, a negative stereotype such as "girls can't do higher math" (line 73) can interfere with a young woman's performance on a difficult trig problem. This makes (G) the best answer.

15. (C)

Because the passage does not examine the origins of stereotypes, only some effects of stereotypes, you can eliminate (A). The passage does not suggest that one type of stereotype is more influential or widespread than others, so (B) can be eliminated. (D) can be eliminated because it contradicts information in the passage—the last paragraph describes a study that showed the effect of stereotypes on seniors.

16. (H)

You can eliminate (F) and (J) because they are too narrow. Although the passage certainly provides examples of the effects of stereotypes on test performance, including effects of racial stereotype awareness on student performance on college entrance exams, the Big Idea of this passage is much broader. The passage also includes descriptions of research done to examine the effect of stereotypes on athletic tasks (golfing) and life decisions (life-prolonging medical care). (H) is the only answer choice that is broad enough to fit the Big Idea of the passage.

17. (B)

Reading the sentence before the referenced line should help you select the best answer. “The students had no idea of the real purpose of the study” (lines 1–2). In other words, the psychologists hid the true purpose of their study.

18. (H)

Religion is the only stereotype not mentioned.

19. (A)

According to the passage, seniors who had been exposed to negative stereotypes about the elderly through subliminal messages were more likely to say that they would decline life-prolonging medical intervention. Seniors who were exposed to positive messages about the elderly were more likely to say that they would accept life-prolonging care. This makes (A) the best answer. (B) contradicts the passage. (C) also contradicts the passage, which reports the results of research using subliminal priming. (D) is the wrong scope—nothing in the passage supports the assertion that frailty or senility is actually caused by stereotypes.

20. (J)

According to the passage, black students who were asked to list their race scored “significantly worse than blacks who did not note their race, and significantly worse than all whites” (lines 64–65). However, “the performance of black Stanfordites who were not explicitly reminded of their race equaled that of whites” (lines 66–68). This information best fits with (J). (F) and (H) can be eliminated because the passage does not compare the influential power of different types of stereotypes. (G) contradicts the study described in the passage.

Passage III**21. (B)**

In lines 10–12 Julia Margaret Cameron is described as “the first woman to have achieved eminence in photography.” The other answer choices contradict information supplied in the passage.

22. (F)

The answer to this question can be found in lines 67–69: “Contemporary taste much prefers her portraits....” and in line 73: “today her fame rests upon her portraits....”

23. (D)

The dates used in the passage tell you that this is a chronological account; the author begins with Cameron’s birth in 1815, tells of her marriage and then her move to England in 1848, points out that she received her first photographic equipment in 1863, describes one of her photographs from 1864, and then concludes the paragraph with her death in 1874.

24. (F)

The dictionary definition of cumbersome is “difficult to handle because of weight or bulk.” (F) most closely fits this definition, and it is the only answer choice that makes sense within the context of the sentence.

25. (B)

(A) contradicts information from the passage, which suggests that Cameron led anything but a conventional life. Neither the money that Cameron earned as a photographer nor her religious beliefs are discussed in the passage, making (C) and (D) incorrect answers.

26. (F)

Lines 49–52 say, “She produced a large body of work that stands up as one of the notable artistic achievements of the Victorian period.” To say that she is “the greatest photographer that ever lived” goes beyond anything stated or implied in the passage. The third paragraph does not compare her importance as an artist during her lifetime to her importance today. The passage also does not state that she “revolutionized” any photographic methods.

27. (C)

The answer to this question can be found in lines 6–9: “photography, being a new medium outside the traditional academic framework, was wide open to women and offered them opportunities that the older fields did not....”

28. (G)

These titles refer to allegorical pictures, as described in lines 65–67: “Victorian critics were particularly impressed by her allegorical pictures, many of them based on the poems of her friend and neighbor Tennyson....”

29. (D)

The answer to this question can be found in lines 67–69: “Contemporary taste much prefers her portraits and finds her narrative scenes sentimental and sometimes in bad taste.”

30. (F)

The author says that Cameron “achieved eminence” (line 11) in her field, that she “devoted herself wholly to this art” (line 46), and that “no other woman photographer has ever enjoyed such success” (lines 61–62). Only (F) fits these descriptions.

Passage IV**31. (D)**

The sentence that is referenced in the question reads: “the scientists at the Jet Propulsion Laboratory could not suppress a certain nervous anticipation” (lines 3–5). In other words, they could not stop themselves from feeling a nervous anticipation. Only (D) makes sense in this context. It would not make sense for the scientists to (A) oppose, (B) vanquish, or (C) prohibit their nervous anticipation.

32. (F)

The answer to this question is stated directly in the passage. “To detect biological activity, Martian soil samples were treated with various nutrients that would produce characteristic by-products if life forms were active in the soil” (lines 23–26). This makes (F) the best answer.

33. (C)

The answer to this question can be found at the end of the second paragraph. The scientists “heated a soil sample to look for signs of organic material but found none, an unexpected result because at least organic compounds from the steady bombardment of the Martian surface by meteorites were thought to have been present” (lines 28–32). This makes (C) the best answer.

34. (J)

The passage states that “even if life had gotten a start on early Mars, it could not have survived the exposure to ultraviolet radiation when the atmosphere thinned” (lines 41–44). This supports (J) as the best answer. (F) can be eliminated because it contradicts the passage. According to the description of the four experiments in the second paragraph, no organic compounds were found in the Martian soil. (G) can be eliminated because both Earth and Mars are in the path of harmful ultraviolet radiation. Unlike Mars, Earth has a “protective layer of ozone” (lines 44–45). There is no mention in the passage of Earth’s previous atmosphere, so you can not infer that Earth did not once possess an atmosphere rich in carbon dioxide.

35. (B)

The answer to this question can be found in the last sentence of the first paragraph, which says that “the winning entry in a contest at J.P.L. for the photograph most accurately predicting what Mars would look like was a snapshot taken from a particularly arid section of the Mojave Desert” (lines 11–15). In other words, the surface of Mars looked a lot like a rather dry section of the Mojave Desert.

36. (H)

This question asks you to consider the second paragraph as a whole. The second paragraph is all about the results of the four experiments carried on the Viking Landers. These experiments were “designed to detect organic compounds” (lines 18–19). In other words, they were designed to detect signs of life. The results of the four experiments, according to the second paragraph, showed no signs of life. This makes (H) the best answer. (F) can be eliminated because although the scientists were disappointed, the results were not at all “inconclusive.” (G) is too broad—the paragraph only states that scientists “thought it possible that life had developed on early Mars just as it is thought to have developed on Earth” (lines 19–21). Nothing supports the idea that meteorite bombardment of Mars is not consistent (J).

37. (A)

The answer to this question can be found in the next-to-last paragraph of the passage. The beginning of the paragraph describes how endoliths survived in “porous rocks in the Antarctic valleys” (lines 64–65). Some scientists hypothesize that “if life did exist on early Mars, it is possible that it escaped worsening conditions by similarly seeking refuge in rocks” (lines 66–68). In other words, life on Mars might have evolved in the same way that life on Earth evolved.

38. (G)

The answer to this question can be found in the last paragraph of the passage. “Should Mars eventually prove to be barren of life, as some suspect, then this would have a significant impact on the current view of the chemical origins of life” (lines 72–75). In other words, the experiments that show no traces of life on Mars could force scientists to rethink their theories about how life began on Earth.

39. (C)

The passage states that though “Mars’ atmosphere was at one time rich in carbon dioxide and thus thick enough to protect its surface from the harmful rays of the Sun, the carbon dioxide gradually left the atmosphere” (lines 36–40). From this, you can conclude that the carbon dioxide did not destroy organic materials on Mars—if there were any organic materials, the carbon dioxide in the atmosphere protected them. This means you can eliminate Roman numeral II, along with answer choices (B) and (D). The passages states that “Mars never developed a protective layer of ozone as Earth did” (lines 44–45). This suggests that without an ozone layer, Mars could not sustain life. This make (C) the best answer.

40. (G)

The first sentence of the fourth paragraph states that “there are those who still keep open the possibility of life on Mars” (lines 46–48). This supports (G) as the best answer. (F) can be eliminated because the passage does not suggest that the Viking mission was unsuccessful. It states only that the results were “disappointing” (line 46). (H) and (J) can both be eliminated because they contradict information in the passage.

SCIENCE REASONING TEST

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

Passage I

1. (B)

To answer this question, you have to examine the third column of the table, transmittance range. For a material to transmit light at a wavelength of 25 μm , its transmittance range—the range of wavelengths over which the material is transparent—must include 25 μm . Only potassium bromide (0.3–29 μm) and cesium iodide (0.3–70 μm) have transmittance ranges that include 25 μm , so (B) is correct.

2. (F)

The material that contradicts this hypothesis is going to have poor chemical resistance, but a transmittance range less than 10 μm . Lithium fluoride (F) fits the bill: Its chemical resistance is poor, and its transmittance range is less than 6 μm wide. (G) and (J) are wrong because both flint glass and quartz have excellent chemical resistance. (H) is out because cesium iodide has a transmittance range nearly 70 μm wide.

3. (D)

The correct answer is a pair of materials in which the refractive index of the first material is greater than that of the second. In (A), (B), and (C), the refractive index of the first material is less than that of the second. In (D), however, flint glass has a refractive index of 1.66 while calcium fluoride's refractive index is only 1.43. That makes (D) the correct answer.

4. (J)

The easiest way to answer this question is to use the first couple of materials and test each hypothesis on them. (F) and (G) are incorrect because the transmittance range of lithium fluoride is wider than its useful prism range. Comparing the data on lithium fluoride and calcium fluoride rules out (H) because transmittance range does NOT increase as useful prism range decreases. In fact, looking down the rest of the table, you see that transmittance range seems to decrease as useful prism range decreases. (J) is the only one left, and the data on lithium fluoride and calcium fluoride as well as all the other materials confirms that the transmittance range is always wider than, and includes within it, the useful prism range.

5. (B)

According to the footnote to the table, quartz infused with lead oxide is flint glass. A comparison of the properties of pure quartz and flint glass shows that the transmittance range of flint glass is narrower than that of quartz but that its refractive index is greater. This supports (B).

Passage II**6. (H)**

Use the results of both experiments to answer this question. The answer choices all involve temperature, concentration, and solvent in different combinations. To determine whether osmotic pressure is dependent upon a variable, look for a pair of trials in which all conditions except for that variable are identical. In doing so, you see that temperature and concentration affect osmotic pressure, but solvent does not.

7. (B)

Find methanol at 0.5 mol/L, which is in Table 2. The text above the table states that all the trials were conducted under the same temperature (298 K). Therefore, simply look across the row that you identified. The osmotic pressure is 12.23, (B).

8. (G)

To figure out whether or not the sucrose solution will diffuse across the membrane under the conditions described in the question, go back to the definition of osmotic pressure given in the introduction. Once the external pressure reaches the osmotic pressure, osmosis will not occur. In order for osmosis to occur, the external pressure must be less than the osmotic pressure of the solution. The solution in this question is a 0.1 mol/L aqueous sucrose solution at 298 K; those conditions correspond to an osmotic pressure of 2.45 atm. Since the external pressure is 1 atm, which is less than the osmotic pressure, osmosis will occur. From the definition of osmosis in the passage, it is clear that the solution will diffuse from the side of the membrane with a lower concentration of dissolved material, in this case pure water, to the side with a higher concentration, in this case sucrose solution. (G) is correct.

9. (C)

To determine what the scientists investigated in Experiment 1, look at what they varied and what they measured. In Experiment 1, the scientists varied the concentration and the temperature of sucrose solutions, and they measured the osmotic pressure. Therefore, they were investigating the effect of concentration and temperature on osmotic pressure (C). Watch out for (A): it states what was investigated in Experiment 2, not Experiment 1.

10. (F)

The results in Table 2 indicate that osmotic pressure doesn't depend on the solvent, as discussed in the explanation to Question 1. So Statement I is a valid conclusion, and (G) can be eliminated. Statement II is false. The results in Table 1 indicate that osmotic pressure is dependent on concentration as well as temperature. So (H) can be ruled out. Now consider Statement III. It is not a valid conclusion because osmotic pressure is the pressure required to prevent osmosis, so osmosis occurs only if the external pressure is less than the osmotic pressure.

11. (D)

To answer questions that ask about the design of an experiment, look at what the scientists are trying to measure. You're told that osmotic pressure is the pressure required to prevent osmosis. In order to measure the osmotic pressure of a solution, scientists need to be able to tell when osmosis begins. If you have two clear solutions with sucrose dissolved in one of them, how can you tell when there's any movement of solvent between the two of them? If the sucrose is dyed, the color of the solvent will start to turn blue when osmosis starts, i.e., when solvent moves across the membrane to create an equilibrium. Therefore, (D) is correct.

Passage III

12. (J)

Even if you do not know how many °C are equivalent to room temperature, you can eliminate all of the incorrect answer choices. Choices (F), (G), and (H) all reach a boiling point at low temperatures and, therefore, would all be gases at room temperature. (J), at 36° C, is the only logical choice.

13. (C)

To answer this question, you have to look for trends in each table and draw conclusions. This can be done by looking at the values in each category and seeing how they vary with respect to each other. If you look at Tables 1 and 2, you can see that there is a direct variation between boiling point and molecular weight: as one increases, the other increases. Therefore, Statement I is correct, Statement II is false, and you can eliminate (B) and (D). Now consider Statement III. To investigate the relationship between molecular structure and boiling point, you have to keep the third variable—molecular weight—constant. Look at the data for two compounds with different molecular structures but the same molecular weight: N_2 and CO; their boiling points differ. Therefore, Statement III is correct, and (C) is the correct response.

14. (G)

In order to answer this question, you need to establish where C_6H_{14} would fit in Table 1. It is clear from Table 1 that the boiling point increases as the molecular weight increases, so the boiling point of C_6H_{14} will be between the boiling points of molecules with greater and lesser molecular weights. The molecular weight of C_6H_{14} is 86 g/mol, so it will lie between those hydrocarbons with molecular weights of 72 g/mol and 114 g/mol. Therefore, its boiling point will be between 36° C and 126° C. (G), with a value of 70° C, is the only choice that lies between these two boiling points.

15. (A)

N_2 , a nonpolar molecule, and CO, a polar molecule, have identical molecular weights and their boiling points differ by only 4° C. SiH_4 (nonpolar) and PH_3 (polar) have nearly identical molecular weights as well, but the difference between their boiling points is 27° C—much greater than the difference between the boiling points of N_2 and CO, which have lower molecular weights than SiH_4 and PH_3 . The difference between the boiling points of polar and nonpolar substances of similar molecular weight increases as molecular weight increases, so (A) is correct.

16. (H)

If you refer to Table 2, you'll see that for polar substances, as the molar weight goes from 78 to 162, the boiling point goes from -55° C to 97° C. You know the molar weight has to be somewhere between 78 and 162, so (F) is clearly out, and (G), 80, is too close to 78 to be the answer. You would expect the molar weight to be closer to 78 than 162, since 0 is closer to -55 than 97. Therefore (J), 132, is out, and (H) is the answer.

17. (D)

To figure this out, it is best to examine how much the boiling point rises when dealing with similar molar weight gains. For instance, you can roughly compare rates by looking at what happens to straight-chain hydrocarbons when the molar weight goes from 30 to 72 (boiling point change of 124° C), what happens to nonpolar inorganic compounds when the molar weight goes from 32 to 77 (boiling point change of 22° C), and what happens to polar inorganic compounds when the molar weight goes from 34 to 78 (boiling point change of 30° C). From these figures it is clear that the rate at which the boiling point increases with increasing molar weight is the least for nonpolar inorganic compounds, and greatest for straight-chain hydrocarbons, so (D) is correct.

Passage IV**18. (F)**

The question refers to Experiment 2 only, so the correct answer will involve sunlight. Table 2 shows that the average length of the leaves increased from 5.3 cm to 12.4 cm as the amount of sunlight increased from 0 to 3 hours per day. But as the amount of sunlight increased further, leaf size decreased. Therefore, (J) is incorrect. Neither humidity (G) nor water (H) is relevant to Experiment 2.

19. (B)

Table 1 gives leaf widths at 35% and 55% humidity as 1.8 cm and 2.0 cm, respectively. The leaf width at 40% humidity would most likely be between those two figures. (B) is the only choice within that range.

20. (G)

All the answer choices involve humidity and sunlight, which were investigated in Experiments 1 and 2, respectively. In Table 1, leaf length and width were greatest at 75% humidity. In Table 2, they were greatest at 3 hours per day of sunlight. Combining those two conditions, as in (G), would probably produce the largest leaves.

21. (A)

This question relates to the method of the study. Each experiment begins with a statement that 5 groups of seedlings were used. Therefore, (A) is correct. The other answer choices list variables that were manipulated.

22. (J)

(J) is an assumption that underlies the design of all three experiments. If the seedlings were not equally capable of further growth, then changes in leaf size and density could not be reliably attributed to researcher-controlled changes in humidity, sunlight, and temperature. (F) is wrong because all the seedlings were 2–3 cm tall. The seedlings' abilities to germinate (G) or to produce flowers (H) were not mentioned in the passage.

23. (C)

Each of the three experiments investigated a different factor. To produce the most useful new data, researchers would probably vary a fourth condition. Soil mineral content would be an appropriate factor to examine. None of the other choices relate directly to the purpose of the experiments as expressed in Paragraph 1 of the passage.

Passage V**24. (G)**

According to the table, decreasing the cross-sectional area of a given wire always increases resistance, so (G) is correct. (H) is wrong because resistivity, displayed in the second column, is constant for each material and thus cannot be responsible for variations in resistance for any given material. Gauge varies inversely with cross-sectional area, so (J) is incorrect.

25. (B)

Because resistance varies inversely with cross-sectional area A , as discussed in the previous explanation, the correct answer to this question must place A in the denominator. The only choice that does so is (B).

26. (J)

From the table, it appears that if all other factors are equal, a 2-cm wire has higher resistance than a 1-cm wire, a tungsten wire has higher resistance than an aluminum wire, and a wire with a smaller cross-sectional area has higher resistance than one with a greater cross-sectional area. Compare (J) to any other choice and you find that in every way that the wires differ, (J) can be expected to have the higher resistance. Therefore (J) will have the highest resistance among the four wires.

27. (D)

The larger circle represents 10-gauge wire; its diameter is 2.59 mm. The smaller circle has a diameter of only 1.29 mm, but it represents 16-gauge wire, so Statement I is true, and you can eliminate choices (B) and (C) without even checking Statements II or III. To check Statement III, the table shows that the resistance of an iron (Fe) wire is much higher than that of an aluminum (Al) wire with the same length and cross-sectional area. The first sentence of Paragraph 1 defined the resistance of a conductor as “the extent to which it opposes the flow of electricity.” Since iron has a higher resistance than aluminum, iron must not conduct electricity as well. Therefore, Statement III is true, and (D) is correct.

28. (J)

The data indicate that the resistivity of a material doesn’t change when wire length changes. Therefore, the graph of resistivity versus length for tungsten (or any other) wire is a horizontal line.

Passage VI**29. (B)**

The key to this question is determining whether the cat in question is an outdoor or indoor cat. This cat goes outdoors a total of three hours per week, whereas an outdoor cat would spend at least six hours outdoors per week. Therefore, this cat is an indoor cat, and the percentage of dark fur on its body would remain just above 10%.

30. (G)

You can draw a line from 45° across to the solid line representing outdoor cats. If you draw a line from that intersection straight down to the x -axis, you will hit 3°.

31. (B)

If the cat grew dark fur over 30% of its body, it must have been an “outdoor” cat as defined in the passage, and, according to the table, been exposed to temperatures below 5° C (statement I). To be an outdoor cat, a cat does not have to spend more time outdoors than indoors (statement II) but it has to spend time outdoors for 6 consecutive days (statement III).

32. (H)

If a Siamese cat does not have dark fur over more than 10% of its body, then it must *either* be an indoor cat *or* live in an area where it is not regularly exposed to temperatures below 7° C, but not both.

33. (C)

Choice (A) is wrong since the “indoor” cats will not help us, since they don’t go outside. (B) is not a good choice because the “outdoor” cats of the original experiment cannot be used as a control group: The time they spent outside was not monitored—we only know that they spent more than one hour outside a day. (D) is incorrect because the data already gathered only showed that outdoor cats turn darker in cold weather than indoor cats and doesn’t provide any information about how varying the amount of time outdoors affects fur color. The correct answer is (C): A completely new experiment would have to be set up.

Passage VII**34. (J)**

In Experiment 1, the researchers vary what is fed to the cows by giving them meat from scrapie-free sheep and from scrapie-infected sheep. The cows are later examined for signs of BSE. One common type of wrong answer choice for Experiment questions are choices, such as choice G for this question, that include factors that are outside the parameters of the experiment.

35. (A)

In Experiment 2, the researchers vary what is injected into cows' brains. Any answer choice that discusses ingestion as a focus of this experiment is wrong. This eliminates B, C, and D. Often, wrong answer choices for Experiment questions, such as choice B for this question, will include the appropriate information from the wrong experiment.

36. (G)

By examining the method used in a given experiment, one can determine the assumptions the researchers made in carrying out the experiment and the sources of error. Often error enters the experiment because of the assumptions researchers make. In Experiments 1 and 2, the researchers examined the brains of cows a year and a half after the cows were fed scrapie-infected sheep meat or were injected with scrapie-infected sheep brains. If a year and a half is not a sufficient amount of time for BSE to develop, some of the cows that were counted as not infected might have developed BSE if they had been given more time.

37. (C)

To answer this question, you need to determine how to test whether BSE can be transmitted via scrapie-infected goats. To test this, one would compare the effects of feeding cows scrapie-free goat meat with the effects of feeding cows scrapie-infected goat meat and compare the effects of injecting cows with scrapie-free goat brains with the effects of injecting them with scrapie-infected goat brains.

38. (F)

Remember that control groups are used as standards of comparison. The control group used in Experiment 1 is the group that is fed scrapie-free sheep meat. If the same proportion of Group A developed BSE as that of Group B, then the researchers would not have any evidence to support the hypothesis that the ingestion of scrapie-infected sheep meat causes BSE.

39. (B)

Since the proportion of the group of cows that ate scrapie-infected sheep meat and developed BSE was greater than the proportion of the group that was injected with scrapie-infected sheep brains and developed BSE, one can conclude that a cow that eats scrapie-infected sheep meat is more likely to develop BSE than a cow that is injected with scrapie-infected sheep brains. Mere exposure to scrapie-infected sheep, as opposed to ingestion thereof, is never studied in either experiment, so conclusion I can be eliminated.

40. (H)

To answer this question, consider only the results of Experiment 1. In Experiment 1, the researcher varies what is fed to the cows. The number of cows that developed BSE after eating scrapie-infected sheep meat was much greater than the number of cows that developed BSE after eating scrapie-free sheep meat. This is evidence that the ingestion of scrapie-infected sheep meat causes the development of BSE.

HOW TO SCORE YOUR PRACTICE TEST

Scoring Your Test with the iQuest Handheld

There are two options for scoring your test. One choice is to use the Answer Key and Scoring Conversion chart on the following pages. If you choose this route, you can skip the next short set of instructions.

A second option is to use your iQuest handheld to calculate your practice test score. It's incredibly easy! Here's how to do it.

From the iQuest handheld Main Menu, follow these instructions:

1. *Select ACT > Test Mode > Test Scorer.*
2. Select the number of the test you completed.
3. Select the section you want to score.
4. For each question, use the arrow keypad to select a question. Then use the left and right arrow keys to select the correct answer choice. Use the Enter button to submit your answer. If you didn't answer a particular question, use the arrow keys to skip that question in the answer key.

Once you have entered all of your answers for a section, the iQuest handheld will tell you your score for that section. Once you have completed all sections for a test, the iQuest handheld will tell you your total test score equivalent.

Your score on the practice test gives you a rough idea of your range on the actual exam. If you don't like your score, it's not too late to do something about it. Work your way through this book and the drills on the iQuest handheld again and take additional practice tests.

Compute Your Score

- 1** **Figure out your score in each section.** Refer to the answer keys to figure out the number right in each test section. Enter the results below:

**RAW
SCORES**

English:

Reading:

Math:

Science
Reasoning:

- 2** **Find your practice test scores.** Find your raw score on each section in the table below. The score in the far left column indicates your estimated scaled score if this were an actual ACT.

SCALED SCORE	RAW SCORES			
	TEST 1 ENGLISH	TEST 2 MATHEMATICS	TEST 3 READING	TEST 4 SCIENCE REASONING
36	75	60	40	40
35	74	60	40	40
34	73	59	39	39
33	72	58	39	39
32	71	57	38	38
31	70	55–56	37	37
30	69	53–54	36	36
29	68	50–52	35	35
28	67	48–49	34	34
27	65–66	45–47	33	33
26	63–64	43–44	32	32
25	61–62	40–42	31	30–31
24	58–60	38–39	30	28–29
23	56–57	35–37	29	26–27
22	53–55	33–34	28	24–25
21	49–52	31–32	27	21–23
20	46–48	28–30	25–26	19–20
19	44–45	26–27	23–24	17–18
18	41–43	23–25	21–22	16
17	39–40	20–22	19–20	15
16	36–38	17–19	17–18	14
15	34–35	15–16	15–16	13
14	30–33	13–14	13–14	12
13	28–29	11–12	12–13	11
12	25–27	9–10	10–11	10
11	23–24	8	9	9
10	20–22	7	8	8
9	17–19	6	7	7
8	14–16	5	6	6
7	12–13	4	5	5
6	9–11	3	4	4
5	7–8	2	3	3
4	4–6	1	2	2
3	3	1	1	1
2	2	0	0	0
1	1	0	0	0

Compute Your Score

SCALED
SCORES

English:

Reading:

Math:

Science
Reasoning:

3

Find your estimated composite score. To calculate your estimated composite score, simply add together your scaled scores on each subsection and divide by four.

COMPOSITE SCORE: