

**Form Code MFSW**



# The SAT<sup>®</sup>

## **Question-and-Answer Service**

### **May 2012 Administration**

#### **INSIDE:**

- Test questions and correct answers
- The difficulty level for each question
- Your essay prompt and all other essay prompts administered on your test day
- Instructions for scoring your test
- Suggestions for using this report

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SAT<sup>®</sup>

# Using Your Question-and-Answer Service (QAS) Report

This booklet contains the SAT® you took in May 2012, starting with all the essay prompts given in May, including the one you answered. It also includes scoring information. If the SAT you took included an unscored “equating” section, this booklet will not include that section.

## Reviewing Your SAT Results

To make the best use of your personalized QAS report, we suggest that you:

- Read each question in the booklet, then check the report for the type of question, the correct answer, how you answered it and the difficulty level.
- Analyze test questions you answered incorrectly to understand why your answer was incorrect. Check to see whether you might have misread the question or mismarked the answer.
- Keep track of how you did on the different types of questions (as labeled on your QAS report), either by using the table below or by printing your online score report at [sat.collegeboard.org/scores](http://sat.collegeboard.org/scores). This can help you understand your academic strengths and identify areas for improvement.

Section	Type of Question	Number Correct	Number Incorrect	Number Omitted
Critical Reading	C Sentence completion			
	R Passage-based reading			
Mathematics	N Number and operations			
	A Algebra and functions			
	G Geometry and measurement			
	D Data analysis, statistics and probability			
Writing Multiple-Choice	S Improving sentences			
	E Identifying sentence errors			
	P Improving paragraphs			

## Reviewing Your Essay

View a copy of your essay online at [www.collegeboard.org/viewessay](http://www.collegeboard.org/viewessay). On the practice sheets in the back of this booklet, you can try writing your essay again or practice writing an essay for one of the other prompts in this booklet.

## Scoring Your Test

Use the Scoring Worksheet, SAT Essay Scoring Guide and score conversion tables at the back of this booklet to verify the score on your test. Use the Form Code shown at the top of your personalized QAS report to locate your particular score conversion tables. The Scoring Worksheet and score conversion tables are specific to the test you took. Do not try to score any other tests using them.

## Practicing to Take the SAT Again

If you decide to take the SAT again, your QAS results will help you identify the specific areas and types of questions to focus on for additional practice. Free practice resources are available on [sat.collegeboard.org/practice](http://sat.collegeboard.org/practice) including a practice test, additional practice questions, and a helpful tool called SAT Skills Insight™. SAT Skills Insight will show you the types of skills tested on the SAT and suggestions to help you improve your skills for next time.

Now that you're familiar with the test, you're more prepared for the kinds of questions on the SAT. You're also likely to be more comfortable with the test-taking process, including the time limits. On average, students who take the SAT a second time increase their combined critical reading, mathematics and writing scores by about 40 points.



# ESSAY

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## ESSAY

Time — 25 minutes

The essay gives you an opportunity to show how effectively you can develop and express ideas. You should, therefore, take care to develop your point of view, present your ideas logically and clearly, and use language precisely.

Your essay must be written on the lines provided on your answer sheet—you will receive no other paper on which to write. You will have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.

### Important Reminders:

- **A pencil is required for the essay.** An essay written in ink will receive a score of zero.
- **Do not write your essay in your test book.** You will receive credit only for what you write on your answer sheet.
- **An off-topic essay will receive a score of zero.**
- **If your essay does not reflect your original and individual work, your test scores may be canceled.**

You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

People talk too much about their feelings. They share their deepest secrets and innermost thoughts on television talk shows. They write revealing autobiographies. They buy books that advise them to tell others about their feelings. We would be far better off if we followed the advice of Florence Nightingale, a pioneer in the field of nursing, who thought that people too often waste their feelings by talking about them and should instead turn their feelings into actions that bring results.

**Assignment:** Is it better for people to act on their feelings than to talk about them? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

BEGIN WRITING YOUR ESSAY ON PAGE 2 OF THE ANSWER SHEET.

**If you finish before time is called, you may check your work on this section only.  
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**ESSAY**

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You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

As people become more knowledgeable and experienced, they eventually realize that complete equity and justice—whether in politics, in education, or in day-to-day events—will never really be achieved. Even so, they are encouraged to continue to hope for and fight for fairness. But shouldn't people put their energies to better use? There will always be unfairness in life, and becoming an adult means finding ways to make the best of this fact.

**Assignment:** Should people accept unfairness and find ways to make the best of it? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

**BEGIN WRITING YOUR ESSAY ON PAGE 2 OF THE ANSWER SHEET.**

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You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

No amount of wealth can help humanity move forward and make progress, even under the management of the most dedicated and socially conscious workers. Money only leads to selfishness and becomes an irresistible temptation to its owners to abuse it. The only thing that can lead people to praiseworthy ideas and noble deeds is to follow the example of great individuals who put other factors before money.

Adapted from Albert Einstein in Alice Calaprice, *The New Quotable Einstein*

**Assignment:** Does money lead to selfishness? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

BEGIN WRITING YOUR ESSAY ON PAGE 2 OF THE ANSWER SHEET.

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## ESSAY

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- **An off-topic essay will receive a score of zero.**
- **If your essay does not reflect your original and individual work, your test scores may be canceled.**

You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

Advertisements provide information about available products and services. Many people argue, however, that something else is going on: advertisements try to convince people that when they buy things, they are also buying satisfaction and happiness. Advertisements merely fool people into believing that the next “new and improved” product will make their lives better, and the result is that people are even more unhappy and dissatisfied than they would have been without the advertisements.

**Assignment:** Do advertisements contribute to unhappiness and dissatisfaction? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

BEGIN WRITING YOUR ESSAY ON PAGE 2 OF THE ANSWER SHEET.

**If you finish before time is called, you may check your work on this section only.  
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## SECTION 2

Time — 25 minutes

18 Questions

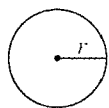
Turn to Section 2 (page 4) of your answer sheet to answer the questions in this section.

**Directions:** This section contains two types of questions. You have 25 minutes to complete both types. For questions 1-8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

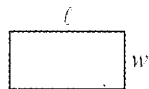
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

Reference Information

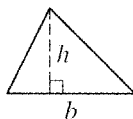


$$A = \pi r^2$$

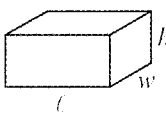
$$C = 2\pi r$$



$$A = lw$$



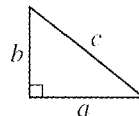
$$A = \frac{1}{2}bh$$



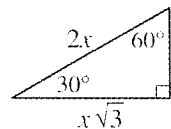
$$V = lwh$$



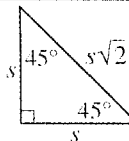
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. If the sum of 8 numbers is 80, what is the average (arithmetic mean) of these 8 numbers?

(A) 10  
(B) 20  
(C) 40  
(D) 60  
(E) 80

2. Which of the following represents the total cost, in dollars, of  $x$  sweaters at \$27 each and  $y$  shirts at \$18 each?

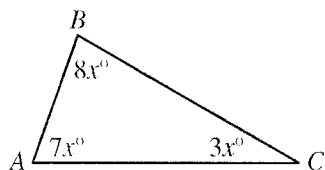
(A)  $18x + 27y$   
(B)  $27x + 18y$   
(C)  $27(x + y)$   
(D)  $45(x + y)$   
(E)  $(27 + x)(18 + y)$

GO ON TO THE NEXT PAGE



3. On the number line above, tick marks are equally spaced. Which arrow indicates  $1\frac{3}{5}$ ?

(A) A  
(B) B  
(C) C  
(D) D  
(E) E



4. In  $\triangle ABC$  above, what is the measure of angle A?
- (A)  $20^\circ$   
(B)  $30^\circ$   
(C)  $35^\circ$   
(D)  $70^\circ$   
(E)  $80^\circ$

5. If  $|x - 5| < 0.6$ , which of the following is a possible value of  $x$ ?

(A) 4.2  
(B) 4.4  
(C) 4.6  
(D) 5.7  
(E) 5.9

6. If  $x^2 - a^2 = 16$  and  $2(x + a) = 8$ , what does  $x - a$  equal?

(A) 2  
(B) 4  
(C) 48  
(D) 64  
(E) 128

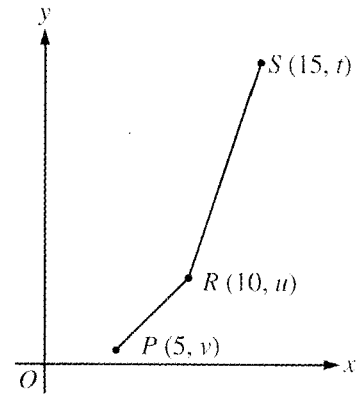


$$a < b < c < d < e$$

$$p = abcde$$

7. In the inequality and the equation above,  $a$ ,  $b$ ,  $c$ ,  $d$ , and  $e$  are positive integers. When just one of these integers is increased by 1 and multiplied by the other four, the new product is  $n$ . The difference  $(n - p)$  is greatest when which of the five integers is increased by 1?

(A)  $a$   
 (B)  $b$   
 (C)  $c$   
 (D)  $d$   
 (E)  $e$



8. In the figure above, the slope of  $\overline{OP}$  (not shown) is  $\frac{1}{5}$ , the slope of  $\overline{PR}$  is 1, and the slope of  $\overline{RS}$  is 3. What is the value of  $t$ ?

(A) 18  
 (B) 19  
 (C) 20  
 (D) 21  
 (E) 22



**Directions:** For Student-Produced Response questions 9-18, use the grids at the bottom of the answer sheet page on which you have answered questions 1-8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Answer:  $\frac{7}{12}$

Write answer in boxes. →

7	/	1	2
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

← Fraction line

Grid in result. →

Answer: 2.5

2	.	5	
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

← Decimal point

Answer: 201  
Either position is correct.

2	0	1	
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

2	0	1	
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

**Note:** You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as  $3\frac{1}{2}$  must be gridded as

3.5 or 7/2. (If  $\boxed{3|\frac{1}{2}|}$  is gridded, it will be interpreted as  $\frac{31}{2}$ , not  $3\frac{1}{2}$ .)

- **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., you should record your result as .666 or .667. **A less accurate value such as .66 or .67 will be scored as incorrect.**

Acceptable ways to grid  $\frac{2}{3}$  are:

2	/	3	
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6

.	6	6	6
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6

.	6	6	7
•	•	•	•
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6

9. When a certain two-digit number is multiplied by a certain one-digit number, the product is 891. If the one-digit number is subtracted from the two-digit number, what is the result?

10. In any circle, the length of a radius divided by the length of a diameter is equal to what number?

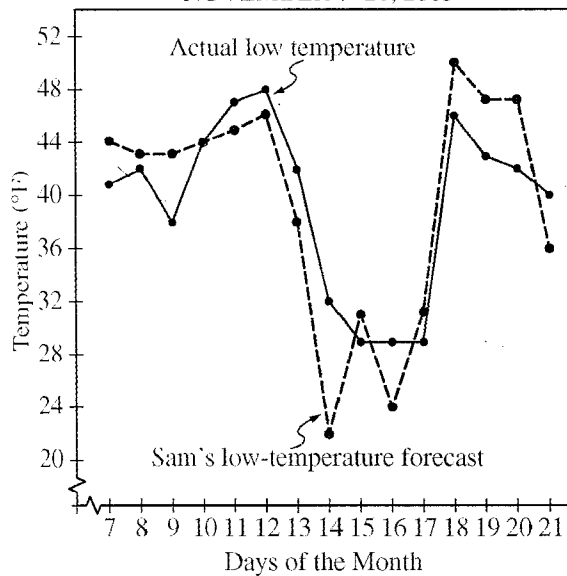
GO ON TO THE NEXT PAGE





11. To get the most benefit from exercise, it is recommended that a person attain a heart rate, measured in beats per minute, that is between 60 percent and 75 percent of the value obtained by subtracting the person's age from 220. What is one possible heart rate, in beats per minute, recommended for a 20-year-old jogger?

SAM'S LOW-TEMPERATURE FORECASTS  
FOR CENTER CITY,  
NOVEMBER 7–21, 2005



12. The graph above shows Sam's low-temperature forecast and the actual low temperature for each of 15 days in November 2005. For how many of the 15 days was the actual low temperature less than Sam's forecast for the low temperature?

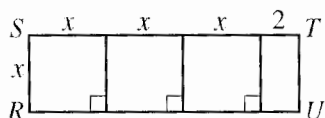
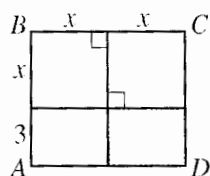
3, 8, 18, ...

13. In the sequence above, the first term is 3 and each term after the first term is twice the sum of the preceding term and 1. For example,  $8 = 2(3 + 1)$ . What is the value of the first term of this sequence that is greater than 100?

$$(p^b)^a = (p^{2c})^b$$

14. In the equation above,  $a$ ,  $b$ ,  $c$ , and  $p$  are integers greater than 1. If  $c = 4$ , what is the value of  $a$ ?

GO ON TO THE NEXT PAGE



15. The areas of rectangles  $ABCD$  and  $RSTU$  above are equal. What is the area of the shaded region?

17. An art school offers a painting class if at least 10 students enroll. The school charges a tuition that is a function of the number of students  $s$  who enroll in the class. Tuition, in dollars, for each student is

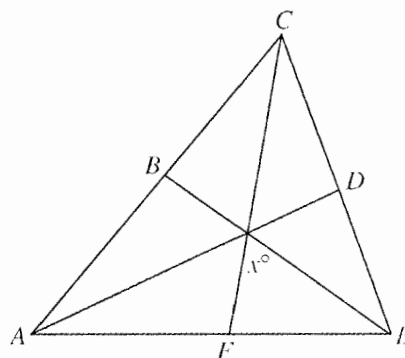
$$t(s) = \frac{1000 + 20s}{s - 1}.$$

What is the total tuition, in dollars, that the school should collect if 21 students enroll? (Disregard the \$ sign when gridding your answer.)

16. For all positive numbers  $t$ , let  $\blacktriangle t$  be defined by

$$\blacktriangle t = \frac{t-1}{t+1}.$$

What is the value of  $\blacktriangle \frac{5}{2}$ ?



18. In triangle  $ACE$  above,  $\overline{AD}$  bisects  $\angle FAB$ ,  $\overline{CF}$  bisects  $\angle BCD$ , and  $\overline{BE}$  bisects  $\angle DEF$ . If the measure of  $\angle FAB = 50^\circ$  and the measure of  $\angle BCD = 60^\circ$ , what is the value of  $x$ ?

**STOP**

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.



## SECTION 3

Time — 25 minutes

35 Questions

Turn to Section 3 (page 4) of your answer sheet to answer the questions in this section.

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

## EXAMPLE:

Laura Ingalls Wilder published her first book  
and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

(A) ● (C) (D) (E)

1. Because the United States in the early 1800s was largely rural, many inventions by women of that period relating to agriculture.

- (A) relating to
- (B) related to
- (C) that were related to
- (D) is related for
- (E) relates for

2. If the tongue was cooled or warmed, taste buds send signals to the brain that the brain interprets as tastes—such as sweetness or saltiness.

- (A) If the tongue was cooled or warmed,
- (B) When the tongue is cooled or warmed,
- (C) Upon the tongue cooling or warming,
- (D) By the tongue being cooled or warmed,
- (E) The tongue cooled or warmed, where

3. The extraordinary success of the Westside Preparatory School has been featured on television, written about in newspapers, and cited by leaders in education around the world.

- (A) School has been featured on television, written about in newspapers, and
- (B) School has been featured on television, written about in newspapers, and being
- (C) School, which is featured on television, being written about in newspapers and
- (D) School, having been featured on television, being written about in newspapers, and
- (E) School, when featured on television, and written about in newspapers and is

4. Uncomfortable in the school's small van, it seemed to last forever for us to make the four-hour journey to our game.

- (A) Uncomfortable in the school's small van, it seemed to last forever for us to make the four-hour journey to our game.
- (B) Uncomfortable for four hours in the school's small van, the journey to our game seemed to last forever.
- (C) Uncomfortable in the school's small van, the four-hour journey to our game seeming to last forever.
- (D) Because we were uncomfortable in the school's small van, the four-hour journey to our game seemed to last forever.
- (E) Because of us being uncomfortable in the school's small van for almost four hours, the journey to our game seems to last forever.



5. Although Felicia's paintings are renowned for their intense beauty, some critics complain of how they lack from variety because they are essentially variations of the same forms and color patterns.
- (A) of how they lack from  
(B) about them lacking from  
(C) about them having lacked  
(D) that they were lacking  
(E) that they lack
6. Those who work late-night shifts find that taking a nap before the shift begins can dramatically increase alertness.
- (A) taking a nap  
(B) when naps are taken  
(C) if they take naps  
(D) if you take a nap  
(E) by taking a nap
7. After the most popular surfboard designer in the United States retires, many surfers were convinced of having no alternative but to ride boards of inferior design.
- (A) retires, many surfers were convinced of having  
(B) retiring, many surfers are convinced that they would have  
(C) retired, many surfers are convinced that they would have  
(D) retired, many surfers were convinced that they would have  
(E) retired, many surfers were convinced of having
8. From 1988 to 1995, Bonnie Blair thrilled the world with her dynamic speed skating and capturing more Winter Olympic medals than any other United States woman in Olympic history.
- (A) speed skating and capturing more  
(B) speed skating, which captured more  
(C) speed skating, she captured the most  
(D) speed skating and captured more  
(E) speed skating and captured the most
9. Oscar Micheaux differed from most other African American silent-film directors in his films they boldly tackled many controversial subjects of the day.
- (A) directors in his films they  
(B) directors, in his films he  
(C) directors; in his films which  
(D) directors in that his films  
(E) directors, films of his
10. The first Mexican to receive the Nobel Prize in Chemistry, demonstrating the threat of certain gases to Earth's ozone layer earned Mario Molina this award.
- (A) The first Mexican to receive the Nobel Prize in Chemistry, demonstrating the threat of certain gases to Earth's ozone layer earned Mario Molina this award.  
(B) The first Mexican to receive the Nobel Prize in Chemistry, Mario Molina earned this award by demonstrating the threat of certain gases to Earth's ozone layer.  
(C) Mario Molina, the first Mexican to receive the Nobel Prize in Chemistry, demonstrated the threat of certain gases to Earth's ozone layer, which is how he earned this award.  
(D) Mario Molina received the Nobel Prize in Chemistry, the first Mexican to do it, and he earns this award with demonstrating the threat of certain gases to Earth's ozone layer.  
(E) Mario Molina was the first Mexican to receive the Nobel Prize in Chemistry, he earned this award by demonstrating the threat of certain gases to Earth's ozone layer.
11. Sam's photographs of the national forest express a deep interest and a respect for the beauty of nature.
- (A) express a deep interest  
(B) expresses a deep interest  
(C) express a deep interest in  
(D) expresses a deep interest in  
(E) that express a deep interest



The following sentences test your ability to recognize grammar and usage errors. Each sentence contains either a single error or no error at all. No sentence contains more than one error. The error, if there is one, is underlined and lettered. If the sentence contains an error, select the one underlined part that must be changed to make the sentence correct. If the sentence is correct, select choice E. In choosing answers, follow the requirements of standard written English.

EXAMPLE:

The other delegates and him immediately  
A B C  
accepted the resolution drafted by the  
D  
neutral states. No error  
E

(A) (B) (C) (D) (E)

12. The process known as thermal conversion is B  
A  
advantageous because it not only breaks down  
C  
plastic waste and also converts it into oil. No error  
D E
13. The lecture we were required to attend was delivered  
A  
so poor that it seemed to go on not just for one hour,  
B C D  
but for several. No error  
E

14. Across the planet's apparently smooth surface run a  
A B C  
faint pattern that reminds one of cracks in an eggshell.  
D  
No error  
E
15. Visitors are quick to notice that the main building  
A  
of the critically acclaimed Denver Art Museum  
B  
consisting of geometric, titanium-clad projections  
C  
that resemble Rocky Mountain peaks. No error  
D E
16. Thomas Edison tries to gain access to the inventions  
A B  
of Granville T. Woods by offering him a prominent  
C  
position in his company, but Woods, preferring his  
D  
independence, declined. No error  
E
17. The oldest examples of alphabetic writing discovered  
A  
so far are almost 4,000 years old, but, because  
B  
they are written in an obscure alphabet, it cannot  
C D  
be translated completely. No error  
E



18. The city of Conway, Wales, now surrounds the  
A B  
medieval walls and castle that originally enclosed  
C  
and protected it. No error  
D E

19. A brand name first appeared on the outside of  
A  
clothing in 1936, where the Levi Strauss company  
B  
began stitching small red labels bearing its name  
C D  
onto the back pockets of its jeans. No error  
E

20. Ants, butterflies, and bees first appeared during  
A  
the Cretaceous period, the more recent of the three  
B  
geologic periods during which dinosaurs lived.  
C D  
No error  
E

21. Exquisitely fashioned gold objects unearthed in  
A B  
southeast England suggests that the early  
C  
Anglo-Saxons were not the crude barbarians  
D  
of legend. No error  
E

22. In the course of writing autobiographical sketches,  
A  
several club members now in their eighties are  
B  
recording childhood memories and describing  
C  
how people lived long ago. No error  
D E

23. The bald eagle was once teetering on the brink  
A  
of extinction, but they have rebounded dramatically  
B C  
in the past three decades. No error  
D E

24. Most climatologists agree that global warming is  
A  
caused from greenhouse gases that are continually  
B C  
being released into Earth's atmosphere. No error  
D E

25. Caricature in art and literature involve portrayals  
A  
that exaggerate and distort prominent characteristics  
B  
of people or things so as to make the subjects seem  
C D  
ridiculous. No error  
E





26. In the novels she wrote for teenagers,  
A

Mary Stolz often concentrated on the attempts of  
B

young protagonists to come to terms with his or her  
C D

turbulent family lives. No error  
E

27. Within a few weeks of leaving home, I was working  
A B

in New York City, where the buildings were taller, the

voices louder, and the opportunities greater  
C

than Montreal. No error  
D E

28. For years historians claimed that pasta was introduced  
A

to Europe around 1295; however, archaeologists  
B C

have uncovered what appears to be pasta-making  
D

devices that date back even earlier. No error  
E

29. Endowed with powerful bodies, large claws, and  
A

piercing teeth, mountain lions are one of the most  
B C

formidable wild creatures native to North America.  
D

No error  
E

**Directions:** The following passage is an early draft of an essay. Some parts of the passage need to be rewritten.

Read the passage and select the best answers for the questions that follow. Some questions are about particular sentences or parts of sentences and ask you to improve sentence structure or word choice. Other questions ask you to consider organization and development. In choosing answers, follow the requirements of standard written English.

**Questions 30-35 refer to the following passage.**

(1) It is well known that parrots can imitate human speech. (2) But can parrots really communicate through language like they do? (3) In other words, do parrots really understand what they hear and say? (4) Based on her having observed a parrot named Alex, Dr. Irene Pepperberg, an animal intelligence researcher, has concluded that parrots really do have powers of human speech. (5) She found that, with some training, Alex was able not only to acquire a large vocabulary but also to use it intelligently. (6) In tests, Alex demonstrated the ability to distinguish more than a hundred objects of various colors, shapes, and textures. (7) To be precise, whenever they showed him a green wooden square and asked, "What color?" "What shape?" and "What matter?" Alex answered each question correctly. (8) It suggests, to Pepperberg at least, that Alex actually reasons with words.

(9) Some animal intelligence researchers argue that Alex's abilities are merely the result of classical conditioning, a technique made famous by Ivan Pavlov, who used it to train dogs to salivate at the sound of a bell. (10) But their argument is unconvincing. (11) Others point out that working intensively with just one animal is unreliable because it incurs the risk of the so-called Clever Hans effect. (12) Clever Hans was a horse that was said to be able to count but was really only responding to his owner's involuntary body language. (13) It is unlikely, though, that Alex benefited from this effect. (14) For instance, the questions were randomly selected and spontaneously reworded by the various researchers who presented them to Alex.



30. In context, which is the best version of the underlined portion of sentence 2 (reproduced below) ?

*But can parrots really communicate through language like they do ?*

- (A) (as it is now)
- (B) like them
- (C) as they can do
- (D) the way humans can
- (E) as a human

31. In context, which of the following is the best version of the underlined portion of sentence 4 (reproduced below) ?

*Based on her having observed a parrot named Alex, Dr. Irene Pepperberg, an animal intelligence researcher, has concluded that parrots really do have powers of human speech.*

- (A) (As it is now)
- (B) Due to such observations on
- (C) From her observations of
- (D) In order to observe
- (E) Thus, by observing

32. In context, which is the best version of the underlined portion of sentence 7 (reproduced below) ?

*To be precise, whenever they showed him a green wooden square and asked, "What color?" "What shape?" and "What matter?" Alex answered each question correctly.*

- (A) (As it is now)
- (B) If they showed him a green wooden square, however,
- (C) Likewise, every time he was shown a green wooden square
- (D) When shown a green wooden square, for instance,
- (E) Even though he was shown a green wooden square

33. In context, which of the following phrases would most effectively replace the word "It" in sentence 8 (reproduced below) ?

*It suggests, to Pepperberg at least, that Alex actually reasons with words.*

- (A) The complexity of the questions
- (B) The accuracy of the responses
- (C) The variety of objects tested
- (D) Recent research
- (E) Common sense

34. In context, which of the following would best be placed immediately after sentence 10 ?

- (A) A comparison of Pepperberg's credentials with those of Ivan Pavlov
- (B) A description of the differing ways in which dogs and parrots produce sounds
- (C) A precise definition of the term "intelligence"
- (D) A list of the words that Alex learned to speak
- (E) An explanation of how Alex's language training differed from classical conditioning

35. Where is the best place to insert the following sentence?

*Great pains were taken to ensure that Alex received no unintended cues from Dr. Pepperberg or her research assistants.*

- (A) Immediately after sentence 4
- (B) Immediately after sentence 6
- (C) Immediately after sentence 7
- (D) Immediately after sentence 9
- (E) Immediately after sentence 13

## STOP

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.

## SECTION 4

Time — 25 minutes

24 Questions

**Turn to Section 4 (page 5) of your answer sheet to answer the questions in this section.****Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

**Example:**

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful  
(B) end . . divisive  
(C) overcome . . unattractive  
(D) extend . . satisfactory  
(E) resolve . . acceptable

(A) (B) (C) (D) ☒

1. Alarmed that land-clearing practices are rapidly ----- crucial habitat, the government of Madagascar is working hard to ----- in its citizens a sense of pride in the nation's diverse animal and plant species.  
(A) depleting . . deter  
(B) restoring . . inspire  
(C) destroying . . instill  
(D) enhancing . . prolong  
(E) isolating . . curtail
2. Not even a microscope is sufficiently powerful to view the ----- molecules that chemist Jacqueline Barton designs.  
(A) trivial (B) grandiloquent (C) infinitesimal  
(D) distended (E) figurative
3. The conclusion of such a vast and complex book should have contained a ----- of the author's ideas to ----- the general remarks he made in the introduction.  
(A) rebuttal . . parallel  
(B) delineation . . negate  
(C) compilation . . disprove  
(D) retraction . . excuse  
(E) summation . . complement
4. Elena, who strongly favored the proposal, was understandably ----- when an influential committee member expressed a view ----- to her own.  
(A) indifferent . . identical  
(B) distressed . . opposed  
(C) puzzled . . similar  
(D) incensed . . sympathetic  
(E) relieved . . contrary
5. The psychologist's ostensibly objective experiments were in fact -----: they subtly yet invariably supported her personal predilections.  
(A) ominous (B) ingratiating (C) theoretical  
(D) lucrative (E) biased
6. The commentator's misuse of language and reliance on inappropriate colloquialisms and jargon are considerable ----- the audience's comprehension.  
(A) reflections of (B) impediments to  
(C) comments on (D) bonuses to  
(E) catalysts of
7. Although Michael's invidious accusations aroused our -----, we managed to preserve our ----- and remain composed.  
(A) vehemence . . ire  
(B) curiosity . . indifference  
(C) gratitude . . decorum  
(D) remorse . . innocence  
(E) resentment . . equanimity
8. Architect Maya Lin wants people to experience her commemorative monuments tactilely; that is, she wants them to ----- these structures.  
(A) interpret (B) envision (C) revere  
(D) confront (E) touch

Each passage below is followed by questions based on its content. Answer the questions on the basis of what is stated or implied in each passage and in any introductory material that may be provided.

**Questions 9-10 are based on the following passage.**

Line Spanish, spoken on the North American continent  
 since Iberian explorers colonized territories in present-day  
 Florida, New Mexico, Texas, and California, has become  
 ubiquitous in the last few decades. But Spanish is not  
 5 spreading in its purest form north of the Rio Grande.  
 A sign of the growing Latino presence in the United States  
 is the astonishingly creative amalgam spoken by many  
 people of Hispanic descent in major cities and in rural areas  
 as well: neither Spanish nor English, but a hybrid known  
 10 as Spanglish. The term is controversial, and so is its  
 impact. Purists refuse to endorse Spanglish as a vehicle  
 of communication; they regard speech as stagnant, when  
 in truth it undergoes eternal renovation.

9. The author of the passage regards the “hybrid” (line 9) as something

- (A) inexplicable
- (B) ingenious
- (C) ludicrous
- (D) ominous
- (E) unfortunate

10. In line 12, “stagnant” most nearly means

- (A) foul
- (B) rotten
- (C) boring
- (D) unchanging
- (E) sluggish

**Questions 11-12 are based on the following passage.**

Line The formerly supercharged Houston space complex  
 aged through the 1980s, developing the outward ambience  
 of a quiet, rural college campus, where the outrageous  
 swamp climate and the surreal routines of human space  
 5 flight were gentled with a landscaping of duck ponds  
 and shade trees. Out along the approach road reclined  
 the symbol of NASA’s faded glory: a giant Saturn moon  
 rocket dismantled into pieces for tourists to inspect, like  
 lengths of fossilized bone from a mythic biotech dragon.  
 10 Rimming the campus were strip malls and tidy residential  
 neighborhoods. A nearby hamburger stand sported a  
 supersized, fiberglass astronaut thirteen feet tall, whose  
 outstretched left arm beckoned with an order of fries.

11. In lines 7-9 (“a giant . . . dragon”), the simile primarily emphasizes the rocket’s

- (A) dominance
- (B) obsolescence
- (C) superior engineering
- (D) appeal to newcomers
- (E) contribution to science

12. The description in the passage serves to

- (A) downplay the risks involved in modern space travel
- (B) point out the unexpected beauty of the Houston space complex
- (C) consider the likelihood of a resurgence in the space program
- (D) reflect on the ingenuity of a former generation of space scientists at the Houston space complex
- (E) show how the space program’s decline is reflected in the setting of the Houston space complex



**Questions 13-24 are based on the following passage.**

*This passage is adapted from an essay by an African American writer who came of age in the 1950s. Since that time, he has been a poet, teacher, civil rights activist, and literary critic.*

Although I don't recall any specific content of books from my early years as a reader, there was the more important emotional content those books represented—the knowledge that the segregated world I was forced to live in was not the only reality. Somewhere beyond that world, somewhere my eyes could not then penetrate, were dreams and possibilities, and I knew this was true because the books I read ravenously, desperately, were voices from that world.

The mystery and miracle of a book is found precisely in the fact that it is a solitary voice penetrating time and space until it goes beyond time and space to alight for a moment in that place within us that is also beyond time and space. Let me explain. I am an indiscriminate reader. By accepted and respected literary standards, my taste in books can be execrable. I buy books in bus stations and drugstores as well as in respectable bookshops. I have read trashy novels with as much pleasure as I have derived from acknowledged literary masterpieces. I have no shame about this because I trust that something-in-me which knows what I need and directs me to it when my more conscious self is unaware that anything may be amiss.

When I was growing up in Nashville, Black people were not permitted in the main library—a situation I rectified at the age of sixteen when I desegregated the library single-handedly. Before that, however, my primary access to books was the bookmobile that came to my neighborhood every Friday evening. Its stock of books was not only limited in number but restricted in subject matter, consisting primarily of Westerns and mysteries discarded from the many White libraries in town. So, from fourteen to sixteen, I read nothing but Western novels and Perry Mason mysteries. Crawling into bed at seven in the evening, I sometimes read two a night. Fortunately, my parents were so glad I was at home that they didn't care what I read. But maybe, too, they understood on some fundamental level what I was doing, although at the time I did not.

Segregation was a deathly spiritual violence, not simply in its many restrictions on where we could live, eat, and go to school. There was also the constant awareness of physical danger. What I have realized is that on those nights I lay in bed reading Westerns and detective novels, I was attempting to neutralize and withstand the violence that was so much a part of my dailiness. In Westerns and mysteries I found a kind of mirror in which one element of my world was isolated and made less harmful to me.

I am thankful that I had parents who, instead of imposing literary judgments on my reading, left me alone to do what I needed to do.

The book is a solitary voice singing through the vastness, heard by a solitary ear. It is this that makes the book important. A book has the capacity to link our solitary souls like pearls on a string and bring us together into a shared and luminous humanity.

Many years ago, when I lived in New York City, I frequented the library near the corner of Twenty-third Street and Seventh Avenue. I was intrigued by the elderly women who came there, especially because all they seemed to read were mysteries and detective novels. I imagined these women returning to their homes, sitting down, and proceeding to read gory mysteries. It wasn't until I myself returned to reading mysteries some years later that I understood. Many mystery novels have older women as detectives—Agatha Christie's Miss Marple being the most well known. There is no other literary genre in which older women are treated with such dignity, respect, and love.

This is the paradox: nothing is more solitary an act than reading a book, and yet nothing else invites us into the depths of the solitary where we are no longer alone. It is an act of wizardry, a magic available to us all.

**13.** Lines 1-5 suggest that, for the author, the principal value of books was their

- (A) intended purpose and audience
- (B) familiar tone and attitude
- (C) effect on his sense of the world
- (D) popularity among the reading public
- (E) reputation among literary critics

**14.** The author's choice of words in lines 7-9 ("I knew . . . world") primarily emphasizes

- (A) his indifference to his surroundings
- (B) his political naïveté
- (C) the intensity of his need
- (D) the mysteriousness of his motivations
- (E) the intellectual character of his curiosity

15. In line 10, the “mystery” most likely refers to
  - (A) a wondrous quality
  - (B) an undiscoverable secret
  - (C) a motiveless cruelty
  - (D) an unsolved crime
  - (E) a type of novel
  
16. In context, the author’s reference to “literary standards” (line 15) suggests that these standards
  - (A) leave no room for reading books that experts do not judge to be worthy
  - (B) fail to take into account that acquiring knowledge is secondary to reading for pleasure
  - (C) do not recognize that all readers interpret a novel in terms of their own experience
  - (D) contradict the experience of many readers who enjoy the classics
  - (E) must be replaced by standards that acknowledge the contributions of all groups
  
17. Which statement about “trashy novels” (line 17) is most consistent with the author’s opinion?
  - (A) They provide reliable factual information.
  - (B) They satisfy primarily childish appetites.
  - (C) They describe actual everyday problems.
  - (D) They can meet a reader’s individual needs.
  - (E) They are trashy only according to outdated standards.
  
18. Which of the following is most analogous to the situation described in lines 19-22 (“I trust . . . amiss”) ?
  - (A) A person who is deficient in a particular nutrient develops, without thinking about it, an appetite for foods rich in that nutrient.
  - (B) A person who is cold and lost in the wilderness is able to start a fire by remembering instructions from an adventure story read long ago.
  - (C) A person who has not previously enjoyed horror movies goes to one with friends and enjoys it.
  - (D) A person with no knowledge of art visits an art museum and, coincidentally, prefers paintings that knowledgeable critics consider the finest.
  - (E) A person looking for a particular book in a large library is able to figure out where it is without consulting the catalog.
  
19. In lines 23-49, the author’s main point about the subject matter of his reading as a teenager is that it
  - (A) fascinated him at the time but in retrospect made him angry
  - (B) presented him with a world that had nothing in common with the one in which he lived
  - (C) was so restricted that he developed a distorted view of the world
  - (D) addressed his emotional needs in ways he did not fully understand
  - (E) was not at all beneficial despite his parents’ acceptance of what he read
  
20. In line 44, “dailiness” most nearly means
  - (A) placid existence
  - (B) boring repetition
  - (C) natural personality
  - (D) everyday life
  - (E) daily responsibilities
  
21. The “string” mentioned in line 53 is best described as :
  - (A) chain of cause and effect
  - (B) tether restraining someone’s movement
  - (C) sharing of the imagination’s experiences
  - (D) collection of decorative objects
  - (E) sequence of clues to a mystery
  
22. The author mentions “Agatha Christie’s Miss Marple” (line 64) in order to
  - (A) liken a real person to a fictional character
  - (B) substantiate a point about a literary genre
  - (C) show how his tastes had changed when he returned to reading mysteries
  - (D) exemplify how a detective’s methods are presented in mystery novels
  - (E) identify a unique character in mystery novels



23. The “paradox” described in the final paragraph is that the act of reading is both

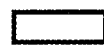
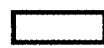
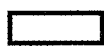
- (A) individual and communal
- (B) personal and impersonal
- (C) active and passive
- (D) depressing and uplifting
- (E) self-interested and altruistic

24. The author’s attitude toward books is best described as

- (A) admiration for their stylistic achievements
- (B) acceptance of their limited educational value
- (C) gratitude for the sense of well-being they impart
- (D) nostalgia for their former preeminence
- (E) skepticism about their continued relevance

**STOP**

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.



## SECTION 5

Time — 25 minutes

20 Questions

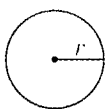
Turn to Section 5 (page 5) of your answer sheet to answer the questions in this section.

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

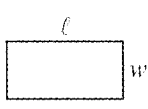
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

Reference Information

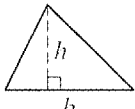


$$A = \pi r^2$$

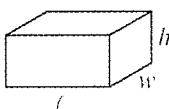
$$C = 2\pi r$$



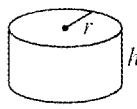
$$A = \ell w$$



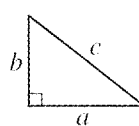
$$A = \frac{1}{2}bh$$



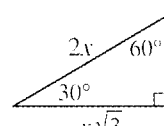
$$V = \ell wh$$



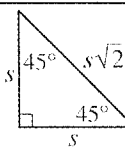
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$

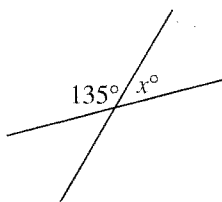


Special Right Triangles



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.



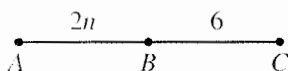
1. The figure above shows two intersecting lines. What is the value of  $x$ ?

- (A) 180  
(B) 135  
(C) 65  
(D) 55  
(E) 45

2. If  $\sqrt{a} = 6$ , then  $a$  equals which of the following?

- (A) 3  
(B) 6  
(C)  $3^2$   
(D)  $6^2$   
(E)  $36^2$

GO ON TO THE NEXT PAGE



Note: Figure not drawn to scale.

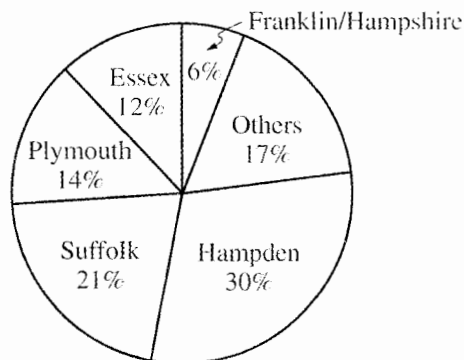
3. If the length of  $\overline{AC}$  above is 16, what is the value of  $n$ ?

(A) 4  
(B) 5  
(C) 6  
(D) 8  
(E) 10

4. Which of the following ratios is equivalent to the ratio of 120 to 36?

(A) 20 to 6  
(B) 12 to 3  
(C) 18 to 60  
(D) 84 to 1  
(E) 84 to 156

REQUESTS FOR JURY TRIALS  
IN MASSACHUSETTS, 2001

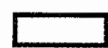
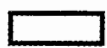
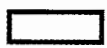


5. During 2001, the state courts of Massachusetts received requests for a total of 5,000 jury trials. The distribution of these requests by county is shown in the circle graph above. How many more jury trials were requested in Suffolk County than in Essex County?

(A) 450  
(B) 550  
(C) 600  
(D) 900  
(E) 1,050

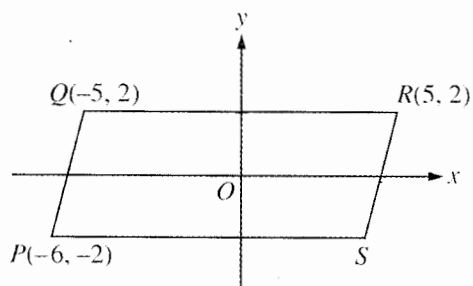
6. A number  $x$  is added to 5 and the sum is then multiplied by 3. When 3 is subtracted from the product, the result is 24. What is the value of  $x$ ?

(A) 2  
(B) 4  
(C)  $7\frac{1}{3}$   
(D) 14  
(E) 22



7. In a class consisting of 55 boys and 45 girls, 30 students have blue eyes. What is the least possible number of girls in the class who do not have blue eyes?

(A) 10  
(B) 15  
(C) 20  
(D) 25  
(E) 30



8. In the figure above,  $PQRS$  is a parallelogram. What are the coordinates of point  $S$ ?

(A)  $(2, -2)$   
(B)  $(3, -2)$   
(C)  $(4, -2)$   
(D)  $(5, -2)$   
(E)  $(6, -2)$

9. Richard has twice as many pieces of candy as Alice. Bob has  $\frac{3}{4}$  as many pieces of candy as Alice. Richard has  $r$  pieces, Alice has  $a$  pieces, and Bob has  $b$  pieces. If  $r > 0$ , which of the following is true?

(A)  $a > b > r$   
(B)  $a > r > b$   
(C)  $b > r > a$   
(D)  $r > a > b$   
(E)  $r > b > a$

10. The area of the base of a square pyramid is 4. Each of the triangular faces has area 3. What is the total surface area of the pyramid?

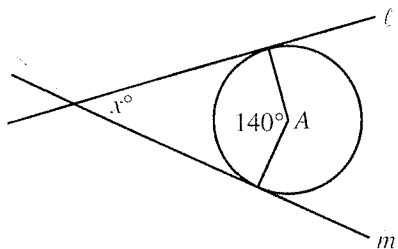
(A) 16  
(B) 19  
(C) 21  
(D) 24  
(E) 28

11. How many positive 2-digit integers can be formed using the digits 1, 2, 3, and 4 if each digit can be used more than once in any integer?

(A) 4  
(B) 8  
(C) 16  
(D) 24  
(E) 48

12. If  $x - y + z = 10$  and  $-x + y = 3$ , what is the value of  $z$ ?

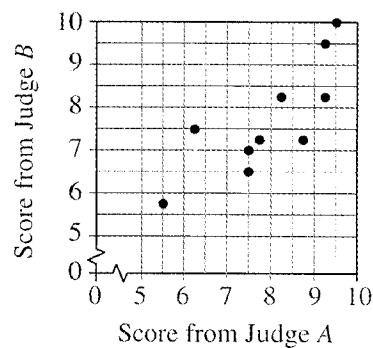
(A) 13  
(B) 7  
(C)  $\frac{10}{3}$   
(D)  $-7$   
(E)  $-13$



13. In the figure above,  $A$  is the center of the circle and lines  $l$  and  $m$  are tangent to the circle at the endpoints of the two radii. What is the value of  $x$ ?

(A) 30  
(B) 40  
(C) 45  
(D) 50  
(E) 60

TALENT SHOW SCORES

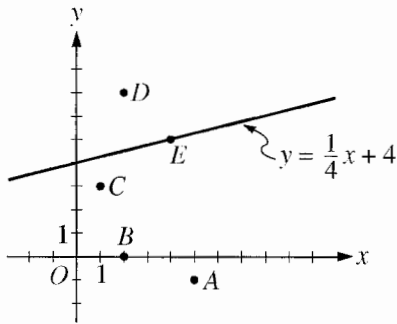


14. Each of the ten performers in a talent show received a score from each of two judges,  $A$  and  $B$ . Each dot in the scatterplot above represents one performer's scores. For these ten performers, what was the maximum difference between the two judges' scores for the same performer?

(A) 0  
(B) 0.50  
(C) 1.00  
(D) 1.50  
(E) 2.75

15. If  $6y = 2x$  and  $y \neq 0$ , what is the value of  $\frac{x}{y}$ ?

(A)  $\frac{1}{4}$   
(B)  $\frac{1}{3}$   
(C) 3  
(D) 4  
(E) 8



16. The figure above shows the graph of  $y = \frac{1}{4}x + 4$ .

Which of the labeled points has coordinates  $(x, y)$

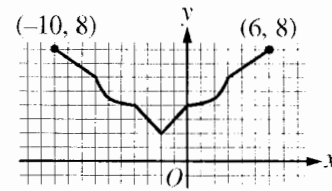
satisfying both of the conditions  $y > x$  and

$$y < \frac{1}{4}x + 4?$$

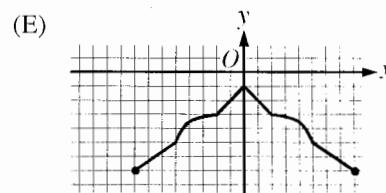
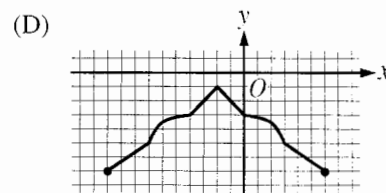
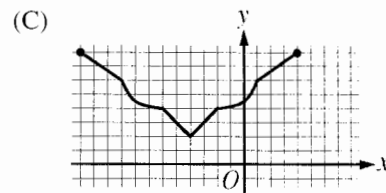
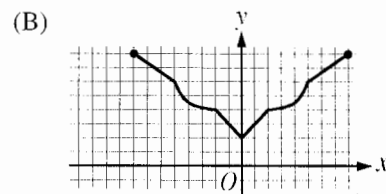
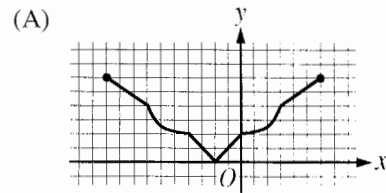
- (A) A
- (B) B
- (C) C
- (D) D
- (E) E

17. The number  $p$  is obtained by moving the decimal point 2 places to the left in the positive number  $n$ . The number  $s$  is obtained by moving the decimal point 1 place to the right in the number  $n$ . The number  $p + s$  is how many times  $n$ ?

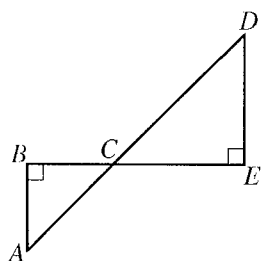
- (A) 1.001
- (B) 1.01
- (C) 10.001
- (D) 10.01
- (E) 10.1



18. The graph of  $y = f(x)$ , where  $f$  is a function, is shown above. Which of the following is the graph of  $y = f(x - 2)$ ?





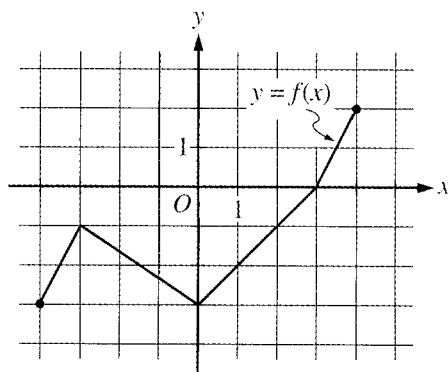


Note: Figure not drawn to scale.

19. In the figure above,  $\overline{BE}$  and  $\overline{AD}$  intersect at point  $C$ .

If  $AB = 2$ ,  $CA = 3$ , and  $BE = 3\sqrt{5}$ , what is the perimeter of  $\triangle CDE$ ?

- (A)  $5 + \sqrt{5}$
- (B)  $5 + \frac{3}{2}\sqrt{5}$
- (C)  $5 + 2\sqrt{5}$
- (D)  $10 + \sqrt{5}$
- (E)  $10 + 2\sqrt{5}$

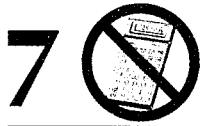


20. In the  $xy$ -plane above, the graph of the function  $f$  is shown. For which of the following values of  $x$  does  $f(x) = f(-3)$ ?

- (A)  $-4$
- (B)  $-1$
- (C)  $0$
- (D)  $1$
- (E)  $2$

**STOP**

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.



## SECTION 7

Time — 25 minutes

24 Questions

Turn to Section 7 (page 6) of your answer sheet to answer the questions in this section.

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

**Example:**

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful
- (B) end . . divisive
- (C) overcome . . unattractive
- (D) extend . . satisfactory
- (E) resolve . . acceptable

(A) (B) (C) (D) ●

1. In 1909, the first significant strike of working women was ----- by garment workers in New York to ----- low wages and long working hours.

- (A) suspended . . oppose
- (B) investigated . . promote
- (C) averted . . expose
- (D) conducted . . accommodate
- (E) organized . . protest

2. Aerospace engineer Dr. Aprille Ericsson-Jackson does not ----- her responsibilities as a role model; instead, she ----- the opportunity to encourage women and minorities to pursue careers in math and science.

- (A) shun . . squanders
- (B) welcome . . seizes
- (C) ponder . . weighs
- (D) shirk . . embraces
- (E) downplay . . resists

3. Steve tempers his ----- with -----: despite his intense desire to succeed, he remains sensitive to the feelings of others.

- (A) idealism . . despondency
- (B) ambition . . empathy
- (C) determination . . banality
- (D) lethargy . . kindness
- (E) perfectionism . . insolence

4. The senator delivered such ----- speech that her supporters, inspired by her obvious fervor, were moved to action.

- (A) an endearing      (B) an impassioned
- (C) a fastidious      (D) an ostentatious
- (E) a soporific

5. The ancient Greek writer Herodotus was inordinately -----, blithely accepting wildly improbable legends as historical facts.

- (A) imperious      (B) prolific      (C) credulous
- (D) derisive      (E) anachronistic



The passages below are followed by questions based on their content; questions following a pair of related passages may also be based on the relationship between the paired passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

Questions 6-9 are based on the following passages.

**Passage 1**

Line The online news and commentary forums known as  
blogs (a term derived from “Web log”) are not only more  
open than traditional media but are also a better arena for  
argument. Newspapers, magazines, and broadcast media  
5 involve one-way communication from the originator of  
the content to the readers or audience. To be sure, there  
are letters to the editor, but blogs are more fundamentally  
dialogic. Bloggers are engaged in continual debate with  
each other. Many blogs also have comments sections,  
10 allowing nonbloggers to join the conversation. The  
result is a much more freewheeling, egalitarian form of  
communication than one finds in the traditional media.

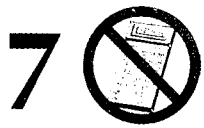
**Passage 2**

15 In terms of how they treat substantive ideas, blogs are  
not very different from newspapers: they present an idea  
and then move on, as quickly as possible, to the next idea.  
No one seems to be willing to chew over even a very  
substantive blog entry for very long; instead, we want new  
ones. Blogs remain great for presenting news: political,  
technological, artistic, whatever. But as vehicles for the  
20 development of ideas they are woefully deficient and will  
necessarily remain so until they become less bound by the  
demands of urgency. Even on the best academic sites, what  
happens more often than not is the conversion of really  
good scholars into really lousy journalists.

6. The author of Passage 1 argues that blogs are “a better arena for argument” (lines 3-4) than are traditional media because blogs

(A) feature strictly original content  
(B) promote interaction between writers and readers  
(C) emphasize controversial topics  
(D) integrate other forms of media  
(E) give authors more freedom in choosing writing projects

7. The author of Passage 1 would most likely respond to lines 13-15 in Passage 2 (“In terms . . . idea”) by arguing that the author of Passage 2 has
- (A) overstated the similarity between blogs and newspapers  
(B) presented a distorted argument by not mentioning other forms of media  
(C) misunderstood the centrality of political news in blogs  
(D) understated the usefulness of blogs in breaking news stories  
(E) underestimated the capacity of newspapers to adapt to new technologies
8. Compared with the author of Passage 1, the author of Passage 2 shows a greater concern about the
- (A) probability that a blog will present inaccurate information  
(B) dubious credentials of those who write in blogs  
(C) need for a greater range of topics to be covered in blogs  
(D) failure of blogs to explore ideas adequately  
(E) lack of attention that mainstream media pay to blogs
9. Which of the following characteristics of blogs is explored in Passage 1 but not in Passage 2?
- (A) Their relationship to more traditional forms of media  
(B) Their potential for generating new ideas  
(C) Their democratic nature  
(D) Their fast-paced character  
(E) Their lack of in-depth news coverage



**Questions 10-15 are based on the following passage.**

*The following passage was adapted from a book of essays published in 1995.*

Line Water gets into things. It soaks them, drenches them,  
permeates them. No watch or coat is truly waterproof.  
There is no legal definition of the word “waterproof,”  
5 because there is no such thing. Nothing resists water  
indefinitely. Even my cowboy hat, a brand featured in  
a picture of a cowboy using the hat to water his horse,  
soaked through after four hours in a driving Pacific storm.

The same thing happens to rocks. Some are porous  
to start with; some contain minerals, like calcium  
10 carbonate, that dissolve in water, creating channels.  
Sometimes a mechanical shock starts the rock’s process of  
disintegration: a moving fault or a crashing wave produces  
a microscopic fracture in the crystalline structure. A thin  
film of water insinuates itself into the crevice. From that  
15 moment, soil becomes possible, and, with it, the life that  
soil supports.

Water behaves strangely when it gets into a microscopic  
crack. In that microscopic environment it is called ordered  
water. The key thing is that it does *not* freeze. The thin film  
20 of water in the crack starts to freeze, but it can’t. When the  
temperature drops, the water molecules try to migrate,  
reordering themselves into ice crystals, but they are already  
in an ordered relationship with respect to the crystals of the  
rock walls. A tug-of-war ensues. The tension is enough to  
25 pull rock grains apart. Equivalent force, on a larger scale,  
might be a wind so strong that it rips the façades off  
skyscrapers or a pull sufficient to part a bridge cable.

As invisible as the process is to our eyes, it is  
nevertheless powerful. The results can be seen deep in  
30 the profiles of older soils, where the digger comes upon  
boulders of granite that crumble easily. They resemble  
the parent rock, but water has weathered them both  
inside and outside.

When salt-impregnated water enters a crack, the salt  
35 may gather more water around its strong attractive ions—  
a process called hydration—forcing the crack apart. If,  
however, the water evaporates, the salts may crystallize  
into a solid state again, gradually splitting the rock as the  
crystals grow. Furthermore, since salts expand more when  
40 heated than do most rocks, hot salt will open a breach  
further.

What does it mean, then, to be as solid as a rock? Better  
to consider the fragility of rock and its transformation into  
soil. One third of the sedimentary rock in the world is  
45 derived from clay, all of which is derived from the  
weathering of rocks. The landscape of the whole Earth  
is itself little more than a monument to the different

weathering rates of its constituent materials. Peaks and  
valleys, beds and swales\*—all can result from the variable  
50 weathering of stone into soil.

\*low-lying stretches of land

**10.** The primary purpose of the passage is to

- (A) explicate certain natural processes
- (B) propose solutions to an environmental problem
- (C) describe day-to-day observations made by a geologist
- (D) provide a technical explanation for an abnormal event
- (E) review certain scientific findings

**11.** In line 8, the author uses a factual statement (“The same . . . rocks”) to emphasize which point?

- (A) There are no essential differences between manufactured and natural objects.
- (B) Even the most solid objects are not invulnerable to water.
- (C) Different substances react to water in different and unpredictable ways.
- (D) The implicit claims made by manufacturers are sometimes false.
- (E) Water is both a force for life and a force for destruction.

**12.** The author considers the shocks mentioned in lines 11-13 “mechanical” because they are

- (A) automatic and regulated
- (B) accomplished unintentionally
- (C) repeated over time
- (D) subject to manipulation by engineers
- (E) brought about by physical forces

**13.** The function of the sentence in lines 25-27 (“Equivalent . . . cable”) is to

- (A) confirm that natural forces can be unpredictable
- (B) suggest an alternate path to a solution
- (C) change the direction of an argument
- (D) illustrate a point by making comparisons
- (E) prove a point by presenting data



14. The information in lines 28-41 ("As . . . further") suggests that rocks in which hypothetical location would disintegrate most rapidly?

(A) A mountain peak with frequent snowfalls  
(B) A boulder on top of a glacier  
(C) A cliff beside a tropical ocean  
(D) The mouth of a cave on a hillside  
(E) The rim of an extinct volcano's crater

15. In line 38, "state" most nearly means

(A) form  
(B) temperament  
(C) region  
(D) unit  
(E) rank



**Questions 16-24 are based on the following passage.**

*The following passage is from a novel, published in 2005, about a British family.*

The caravan\* entered our lives like fate. Although from the outside, it looked like a motor home.

Line It appeared one morning in our driveway, an alien  
5 spaceship from a planet more exciting than our own. Inside, there was a miniature stove with an eye-level grill, and a fridge that was pretending to be a cupboard. Tiffany and I stood on the threshold and inhaled the slightly toxic smell of new upholstery and expectation. I was eight years old and susceptible to the idea that technology could change  
10 your life. They said so in the TV ads.

I have a photograph from that day. We're standing in the driveway, smiling, certain, shoulders locked in a single row. It reminds me of one of those Soviet posters from the thirties: the Family Monroe, brave pioneers of a new type  
15 of holiday, proudly facing the future together. The sun is making me squint, and my mother must have blinked, because her eyes are shut, but otherwise I'd say we look happy.

The caravan itself is blurred in the picture. A hazy beige outline that befits its semimystical presence in our midst. As a family, we'd never been that keen on the outdoors, generally preferring indoor activities such as playing cards or bickering. But we stood in thrall to the brave new world it represented. We'd all read the accompanying brochure  
20 and knew the caravan allied the power of progress with the concept of free will: we would Travel in the Modern Way and Go As We Pleased. Although we never did. We went where our mother told us, which turned out to be Norfolk.

There she is now, breaking free from the line of the  
30 photo and walking back inside. She tip-taps her way back up the driveway, her hair-sprayed curls bouncing up and down, a small, contented smile playing at the corners of her lips. I've never been much good at divining what goes on beyond the net curtains of her eyes, but my guess is that she is thinking about the new fitted kitchen that will one  
35 day be hers. I can sense beige Formica units and a built-in oven hovering just beyond the field of my perception.

Am I exaggerating the role of the caravan in our family history? Or embellishing it? I'm not sure. Alistair's the  
40 one who believes in fate, although he calls it "genetic predisposition." But then he has his reasons for this. I'm more skeptical, I'll admit. But then, as you'll see, I have my reasons for this too.

If I wasn't married to Alistair, I suspect that I'd tell  
45 this story differently. But I know what I know. He showed me a gene map once. It was like a temperature chart or a rainfall map, with Europe portrayed as colored contours. It showed how populations have merged and blended, how you can track the passage of people across continents by the DNA left behind in the cells of their descendents.  
50 That's you, Alistair said, and me. We are a sum of the past.

Don't you mean we are the sum of *our* past? I said. No, he said, we're the sum of other people's pasts. We're made up of other people's genes. We're the bits they leave behind.

55 And it's true, I have my grandmother's skin (sallow) and my mother's hair (mouse). But I can't blame them for what happened. I can't blame anybody. Or at least I can't blame anyone other than myself. I, Rebecca Monroe, take  
60 full responsibility for most of what happened. And the rest? I put it down to chance. Poor timing. Bad luck. It's not a fashionable theory, but then this was the seventies. It's probably best to try and leave fashion out of it.

\* British term for motor home

**16.** Which of the following best describes the first two sentences (lines 1-2) of the passage?

- (A) A sweeping generalization followed by a critical analysis
- (B) A statement of fact followed by a personal reaction
- (C) A sentimental reflection followed by an embarrassed admission
- (D) A fatalistic pronouncement followed by resigned acceptance
- (E) A dramatic assertion followed by humorous anticlimax

**17.** Lines 8-10 ("I was . . . ads") primarily suggest the child's

- (A) curiosity
- (B) defensiveness
- (C) wariness
- (D) humility
- (E) naïveté

**18.** In lines 24-28 ("We'd . . . Norfolk"), the narrator emphasizes a contrast between

- (A) expectation and reality
- (B) desire and need
- (C) hope and despair
- (D) rigidity and carelessness
- (E) process and outcome



19. In lines 26-27, the narrator uses capital letters to
- (A) gently poke fun at certain concepts
  - (B) dramatically underscore the importance of technology
  - (C) earnestly encourage people to pursue certain goals
  - (D) sarcastically illustrate the incompatibility of two ideas
  - (E) indirectly hint at the unusualness of some beliefs
20. In lines 33-34 (“I’ve . . . eyes”), the narrator portrays her mother as appearing somewhat
- (A) unconventional
  - (B) romantic
  - (C) domineering
  - (D) enigmatic
  - (E) manipulative
21. Lines 38-39 (“Am I . . . sure”) primarily serve to
- (A) interject a humorous moment in the narrative
  - (B) explain a choice the narrator has made
  - (C) play down the importance of a pivotal moment
  - (D) emphasize the narrator’s intellectual rigor
  - (E) reflect on the accuracy of the narrator’s memories
22. Lines 44-45 (“If I . . . know”) primarily indicate the narrator’s
- (A) awareness that Alistair’s views have shaped her perspective
  - (B) acknowledgment that she has a regrettable tendency to hold grudges
  - (C) disinclination to make critical changes in her life
  - (D) unwillingness to accept responsibility for her life choices
  - (E) defensiveness about knowing less than Alistair does about science
23. In discussing the “gene map” (line 46), Alistair emphasizes the view that individuals
- (A) can be reluctant to make use of information about their own past
  - (B) are part of something universal and interconnected
  - (C) often fail to recognize their essential similarities
  - (D) need frequent contact with each other in group situations
  - (E) sometimes neglect to account for the science of genetics
24. Compared to the narrator, Alistair appears to be more
- (A) naturally carefree
  - (B) philosophically oriented
  - (C) scientifically inclined
  - (D) temperamentally suspicious
  - (E) unswervingly loyal

**STOP**

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.



## SECTION 8

Time — 20 minutes

16 Questions

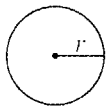
Turn to Section 8 (page 7) of your answer sheet to answer the questions in this section.

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

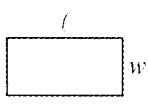
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

Reference Information

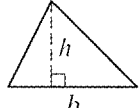


$$A = \pi r^2$$

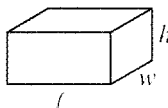
$$C = 2\pi r$$



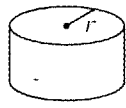
$$A = lw$$



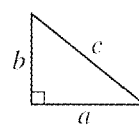
$$A = \frac{1}{2}bh$$



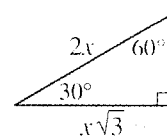
$$V = lwh$$



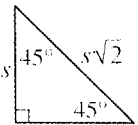
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. Juanita is the 1st person in line and Ada is the 15th person in line. How many people are in line between Juanita and Ada?

(A) 11  
(B) 12  
(C) 13  
(D) 14  
(E) 15

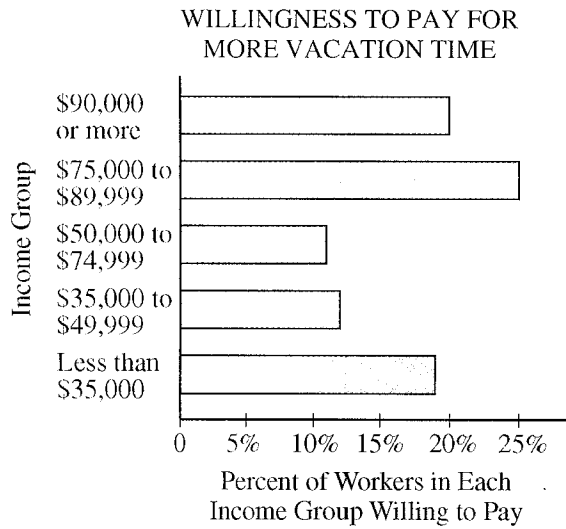
$$y = 2x + c$$

2. In the equation above,  $c$  is a constant. If  $y = 8$  when  $x = 3$ , what is the value of  $x$  when  $y = 4$ ?

(A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

GO ON TO THE NEXT PAGE



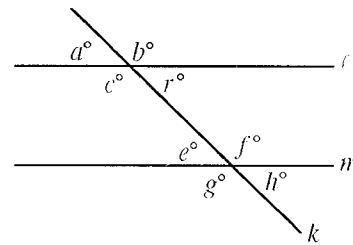


3. In a survey, workers in five income groups were asked, "Are you willing to pay for more vacation time?" The bar graph above shows, for each of the income groups, the percent of that group that answered yes to the question. If there were 2,000 people in the \$75,000 to \$89,999 income group, how many in that group answered yes to the question?

(A) 200  
(B) 240  
(C) 300  
(D) 400  
(E) 500

4. The sum of 5 integers is 250. When the least number,  $a$ , and the greatest number,  $z$ , are removed, the sum of the 3 remaining numbers is 150. Which of the following statements must be true?

(A)  $a > 0$   
(B)  $z > 100$   
(C)  $z + a = 150$   
(D)  $z + a = 100$   
(E)  $z - a = 100$



5. In the figure above, line  $\ell$  is parallel to line  $m$ . Which of the following must be true?

I.  $b + c = 180$   
II.  $b + e = 180$   
III.  $b + h = 180$

(A) I only  
(B) II only  
(C) III only  
(D) I and II  
(E) II and III



6. A doughnut is to be selected at random from a box of 24 doughnuts. If the probability that the doughnut selected will be a jelly doughnut is  $\frac{1}{12}$ , how many jelly doughnuts are in the box?

(A) 1  
(B) 2  
(C) 4  
(D) 12  
(E) 22

8. A store has gift certificates in the amounts of \$5, \$10, \$15, \$20, and \$50. Sue gave Bill gift certificates from the store that totaled exactly \$235. If she used the minimum number of certificates, how many \$10 certificates did she give Bill?

(A) None  
(B) One  
(C) Two  
(D) Three  
(E) Four

7. If  $t$  and  $y$  are positive integers and  $\frac{3}{t} = \frac{y}{4}$ , what is the value of  $3ty$ ?

(A) 4  
(B) 12  
(C) 18  
(D) 30  
(E) 36



9. In the  $xy$ -plane, the graph of  $y = ax^2 + 5$  passes through the point  $(-3, 2)$ . What is the value of  $a$ ?

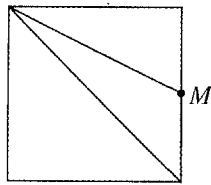
(A)  $-2$

(B)  $-\frac{1}{2}$

(C)  $-\frac{1}{3}$

(D)  $1$

(E)  $2$



10. In the figure above,  $M$  is the midpoint of one side of the square. If the area of the square is 24, what is the sum of the areas of the shaded regions?

(A) 15

(B) 18

(C) 20

(D) 21

(E) 22

11. The first term of a sequence of integers is  $x$  and the second term is  $7x$ . Each term after the first is 12 greater than the preceding term. What is the fourth term of this sequence?

(A) 28

(B) 38

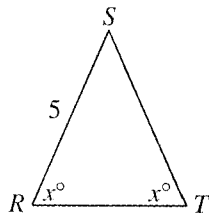
(C) 48

(D) 343

(E) 355



12. For a certain fraction, if 2 is added to the denominator and 2 is subtracted from the numerator, the value of the fraction does not change. What is the value of the fraction?
- (A)  $-2$   
(B)  $-1$   
(C)  $-\frac{1}{2}$   
(D)  $1$   
(E)  $2$
13. In the  $xy$ -coordinate plane, a circle with radius 2 has its center at the point  $(3, 5)$ . When the circle is reflected across the  $x$ -axis, its image is another circle. What is the distance between the centers of the two circles?
- (A) 4  
(B) 6  
(C) 8  
(D) 10  
(E) 14
14. Thirty different integers are chosen at random from the integers 1 to 50, inclusive. Which of the following statements must be true?
- I. At least one of the integers chosen is odd.  
II. At least one of the integers chosen is a multiple of 5.  
III. At least one of the integers chosen is less than 15.
- (A) I only  
(B) II only  
(C) I and II only  
(D) I and III only  
(E) I, II, and III



15. If the perimeter of  $\triangle RST$  above is 14, what is the length of the perpendicular line segment (not shown) from  $S$  to side  $\overline{RT}$ ?

(A) 3  
(B) 4  
(C)  $\sqrt{19}$   
(D)  $\sqrt{20}$   
(E)  $\sqrt{21}$

16. For a certain type of fish, the weight, in ounces, of a fish is directly proportional to the square of its length, in inches. A 6-inch-long fish of this type weighs 24 ounces. How many ounces does a 9-inch-long fish of this type weigh?

(A) 27  
(B) 36  
(C) 45  
(D) 54  
(E) 69

**STOP**

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.

**SECTION 9****Time — 20 minutes****19 Questions****Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.****Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

**Example:**

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful  
(B) end . . divisive  
(C) overcome . . unattractive  
(D) extend . . satisfactory  
(E) resolve . . acceptable

(A) (B) (C) (D) ☒

- The signs that the skeleton had been tampered with were so ----- that the archaeologist almost failed to notice them.  
(A) subtle (B) numerous (C) unavoidable  
(D) obvious (E) substantial
- In the past, paintings by Black American artists often were -----; in contrast, many art critics today advocate an understanding of the works of Black artists as ----- to appreciating America's diverse heritage.  
(A) neglected . . essential  
(B) praised . . negligible  
(C) ignored . . irrelevant  
(D) overvalued . . vital  
(E) studied . . helpful
- Although optimists often encourage people to anticipate success, an excessive ----- in future outcomes may be unrealistic, even -----.  
(A) participation . . immodest  
(B) confidence . . delusional  
(C) trust . . judicious  
(D) interest . . speculative  
(E) absorption . . pragmatic
- Studying gray whales during the 1970s, marine biologist Mary Lou Jones dubbed one of her subjects "Amazing Grace," for its friendliness was ----- and its movements underwater ----- beyond description.  
(A) prosaic . . nimble  
(B) astonishing . . fluid  
(C) habitual . . taut  
(D) extraordinary . . playful  
(E) deceptive . . spry
- The ----- nature of the virus allows it to continually change its form and thus go undetected by the body's immune system.  
(A) virulent (B) contagious (C) debilitating  
(D) protean (E) benign
- The city reveals its unique type of ----- most fully during the cheerful and noisy New Year's celebrations, which attract international as well as local participants.  
(A) insularity (B) pomposity (C) conviviality  
(D) conventionality (E) introspection



The two passages below are followed by questions based on their content and on the relationship between the two passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

**Questions 7-19 are based on the following passages.**

*These two passages are adapted from books published in 2000 and 2004, respectively.*

**Passage 1**

Line A takeover is under way in higher education. All over  
the world, universities are offering their research facilities,  
and priceless academic credibility, for corporations to  
use as they please. Corporate research partnerships at  
5 universities are used for everything: designing gear for  
athletics companies, developing more efficient technologies  
for energy prospectors, testing the consumer demand for  
new telecommunications products, etc.

Dr. Betty Dong had the misfortune to be involved in  
10 one of the most egregious of these new assignments as the  
director of a study sponsored by a British pharmaceutical  
company. The fate of that partnership does much to  
illuminate precisely how the mandate of universities as  
sites for public-interest research is often squarely at odds  
15 with the interests of corporate sponsorship. Dr. Dong's  
study compared the effectiveness of the company's drug  
with a generic competitor. The company hoped that the  
research would prove that its drug was better than the  
generic one—a claim that, if legitimized by a study from  
20 a respected university in the United States, would increase  
sales. Instead, Dr. Dong found that the opposite was true,  
but the company successfully halted publication of her  
findings, citing a clause in the partnership contract that  
gave the company veto rights over the publication of  
25 findings. Her university, fearing a costly lawsuit, sided  
with the company. Only after the whole ordeal was  
exposed in the media did the company back off. "The  
victim is obvious: the university," wrote one commentator.  
"Each infringement on its unwritten contract with society  
30 to avoid secrecy whenever possible and maintain its  
independence from government or corporate pressure  
weakens its integrity."

There is another kind of commercialization that takes  
place at universities daily. As one university president  
35 says, "We have taken the great leap forward and  
said: 'Let's pretend we're a corporation.'" This idea is  
disturbingly evident in what professors describe as the  
mall mentality—the more college campuses act and look  
like places where everything is for sale, the more students  
40 behave like consumers. Professors tell stories of students  
filling out their course evaluation forms with all the smug  
self-righteousness of a tourist responding to a customer

satisfaction form at a large hotel chain. "Most of all I  
dislike the attitude of calm consumer expertise that  
45 pervades the responses. I'm disturbed by the serene belief  
that my function—and, more important, Freud's, or  
Shakespeare's, or Blake's—is to divert, entertain, and  
interest," writes one professor. Another, who teaches at  
a school with a full-fledged mall on campus, laments the  
50 way his students slip into class slurping expensive coffees,  
chat in the back, and slip out. They're cruising, shopping,  
disengaged.

**Passage 2**

History has featured prominently in recent debates  
about the commercialization of higher education.  
55 One university official has noted that "commercial  
collaborations" are part of "the very heritage that has  
allowed the university to thrive." He points out that his  
school is "one of the original land-grant universities,"  
whose stated purpose was to marry scientific insight with  
60 practical knowledge to improve agricultural productivity.  
This might not sound like commerce, but it was and  
still is."

He has a point. Certainly in comparison with their  
European counterparts, universities in the United States  
65 have always displayed a strong utilitarian bent. This  
conception of education reflects deeply ingrained  
American values. As a nation of pioneers, pragmatists,  
and entrepreneurs, Americans have long taken to viewing  
knowledge as a means to *other* ends, rather than a value  
70 in and of itself. One renowned historian has asserted that,  
for typical nineteenth-century Americans, education was  
their "religion," provided that it "be practical and pay  
dividends." Another historian has shrewdly observed that,  
while Americans profess universal admiration for people  
75 of intelligence, they don't necessarily feel the same  
way about *intellectuals*. The intellectual heroes of the  
United States have tended to be inventors like Thomas  
Edison and Benjamin Franklin, practical individuals whose  
contributions arose largely through direct interaction with  
80 the "real world." Common sense over abstract learning,  
hands-on experience over erudition: this has long been  
an unspoken national creed. Within such a culture, it's  
no surprise that universities have often sought to  
legitimate their existence by emphasizing their utility,  
85 training students for practical careers and generating  
scientific and technological breakthroughs to spur  
economic growth.



But while all of this is true, it does not follow that the level of commercial engagement in higher education today is unexceptional or that universities have been guided solely by utilitarian aims. Throughout American history, there have been prominent voices who called on universities to preserve their autonomy and primary commitment to teaching and research. Indeed, much of what we value most about higher education today—academic freedom, the commitment to free inquiry and disinterested research, the ideal of a well-rounded education—exists because such voices warned against allowing external forces to threaten these distinctive values. It may be true that universities in America have never been completely removed from the marketplace. Yet it is precisely because they have stubbornly resisted forsaking their independence and have refused to adopt narrow market values that universities have played such a unique role in American life.

\* Educational institutions funded by grants of federally controlled land, made possible by congressional passage of the Morrill Acts in 1862 and 1890.

7. The author of each passage suggests that universities should
  - (A) return control of classrooms to professors
  - (B) resist extensive commercialization
  - (C) follow the European model of education
  - (D) acknowledge their land-grant heritage
  - (E) use their tuition dollars more wisely
8. The tone of the first sentence of Passage 1 (“A takeover . . . education”) is best described as
  - (A) lighthearted
  - (B) reflective
  - (C) inquisitive
  - (D) urgent
  - (E) irreverent
9. The case described in lines 9-32 suggests that the integrity of university research collaborations would benefit if
  - (A) the partnering company appointed a director over the project
  - (B) universities dispensed with certain internal policies
  - (C) universities did not use government-funded facilities when doing corporate-sponsored research
  - (D) universities limited the control corporate partners have over publishing findings
  - (E) research partners minimized media involvement in their joint undertakings
10. Lines 17-21 (“The company . . . sales”) indicate that the company was seeking primarily
  - (A) pharmaceutical expertise
  - (B) sales and marketing advice
  - (C) corporate self-sufficiency
  - (D) a cost-effective research solution
  - (E) a prestigious endorsement
11. In lines 43-52 (“Most . . . disengaged”), the author of Passage 1 implies that the professors are
  - (A) perturbed
  - (B) uncertain
  - (C) detached
  - (D) amused
  - (E) arrogant
12. In lines 76-80, Edison and Franklin are cited as individuals who are valued for their
  - (A) leadership skills
  - (B) financial success
  - (C) pragmatic intelligence
  - (D) absolute dependability
  - (E) academic accomplishments
13. In line 89, “engagement” most nearly means
  - (A) pledge
  - (B) involvement
  - (C) attraction
  - (D) appointment
  - (E) conflict
14. In lines 100-101 (“It may . . . marketplace”), the author of Passage 2 primarily does which of the following?
  - (A) Proposes a new hypothesis
  - (B) Expresses optimism
  - (C) Provides specific evidence
  - (D) Debates an issue
  - (E) Acknowledges a historical force





15. The claim in lines 102-103, Passage 2 (“they have . . . independence”), is most directly contradicted by which information in Passage 1 ?
- (A) That university research partnerships with corporations sometimes generate new products
  - (B) That Dr. Dong’s university initially condoned suppressing her findings
  - (C) That the media exposed the British pharmaceutical company’s actions
  - (D) That students are viewing their education as a consumer experience
  - (E) That college professors are becoming disenchanted with a consumer culture
16. Both passages make repeated use of
- (A) literary references
  - (B) personal anecdotes
  - (C) direct quotations
  - (D) extended analogies
  - (E) rhetorical questions
17. Which topic regarding universities is discussed in Passage 1 but NOT in Passage 2 ?
- (A) Commercial collaborations
  - (B) The values represented by universities
  - (C) The behavior of students
  - (D) The training of intellectuals
  - (E) The high cost of tuition
18. Which point is made in Passage 2 but NOT in Passage 1 ?
- (A) American universities should seek to maintain independence from external influences.
  - (B) By the end of the twentieth century, the commercialization of American universities was an indisputable fact.
  - (C) Corporate and commercial pressures can threaten the integrity of American universities.
  - (D) The stance of college professors is evidence of the commercialization of American universities.
  - (E) Historical precedents and cultural values have influenced how American universities perceive their mission.
19. A significant difference between the two passages is that Passage 1 is
- (A) critical of a current development, whereas Passage 2 places that development in its historical context
  - (B) vague and abstract, whereas Passage 2 uses specific examples
  - (C) based primarily on secondhand information, whereas Passage 2 is based on personal experience
  - (D) conversational and idiosyncratic, whereas Passage 2 is technical and specialized
  - (E) focused on a single university, whereas Passage 2 considers the broader history of multiple universities

**STOP**

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.



## SECTION 10

Time — 10 minutes

14 Questions

Turn to Section 10 (page 7) of your answer sheet to answer the questions in this section.

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

EXAMPLE:

Laura Ingalls Wilder published her first book and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

(A) ● (C) (D) (E)

1. Calvin was surprised by discovering that although his sister had never played chess before, she could beat him without much effort.

- (A) by discovering that although
- (B) to discover that although
- (C) by the discovery that whether
- (D) with his discovery that until
- (E) when he discovers that as

2. Jacqueline was weak ever since she came down with the flu three weeks ago.

- (A) Jacqueline was weak ever since she came
- (B) Jacqueline is weak ever since she came
- (C) Jacqueline, weak ever since coming
- (D) Jacqueline is weak, this has been since coming
- (E) Jacqueline has been weak ever since she came

3. By definition, an isosceles triangle is when a triangle has two sides of equal length.

- (A) when a triangle
- (B) if the triangle
- (C) one where it
- (D) one of those which
- (E) a triangle that

4. Postponing it because of stormy weather, the D-Day invasion of France began at 6:30 A.M. on June 6, 1944.

- (A) Postponing it because of stormy weather,
- (B) It being postponed due to stormy weather,
- (C) Having been postponed because of stormy weather,
- (D) Stormy weather had postponed it, because of this
- (E) Due to stormy weather postponing it,



5. Melville Herskovits' research on the preservation of African cultures in America contradicted the work of E. Franklin Frazier, who postulated that conditions in America caused enslaved Africans into their developing an entirely new culture.
- (A) America caused enslaved Africans into their developing
  - (B) America caused enslaved Africans to develop
  - (C) America, so caused enslaved Africans to develop
  - (D) America, they caused enslaved Africans developing
  - (E) America, which caused enslaved Africans to develop
6. Sometimes in Colorado it snows heavily in the mountains whereas remaining sunny, warm, and dry on the plains.
- (A) mountains whereas remaining sunny, warm, and dry on the plains
  - (B) mountains while the plains remain sunny, warm, and dry
  - (C) mountains, the plains remain sunny, warm, and dry
  - (D) mountains, it remains sunny, warm, and dry on the plains
  - (E) mountains, but remained sunny, warm and dry in the plains
7. Group discussions will be held each afternoon on such topics as education, public policy, to communicate clearly, and cultural diversity.
- (A) topics as education, public policy, to communicate clearly
  - (B) topics, which are education, public policy, to communicate clearly
  - (C) topics: education, public policy, clear communication
  - (D) a topic as education, public policy, to communicate clearly
  - (E) topics as education, public policy, clear communication
8. Nylon, created wholly out of inorganic chemicals, was the world's first truly synthetic fiber when it was introduced in 1938.
- (A) created wholly out of
  - (B) wholly created through using
  - (C) it was created wholly from
  - (D) which has been created wholly by
  - (E) out of which it was created from
9. In the event that the survey results confirm our assumptions that we made, there will be a change implemented by us in our advertising.
- (A) In the event that the survey results confirm our assumptions that we made, there will be a change implemented by us in our advertising.
  - (B) When the event occurs that the survey results confirm our assumptions, there will be advertising changes implemented.
  - (C) Having the survey results confirm our assumptions will lead to advertising changes by us.
  - (D) To have the survey results confirming our assumptions, we will change our advertising because of it.
  - (E) If the survey results confirm our assumptions, we will change our advertising.
10. Swimmer Mark Spitz was the most decorated athlete of the 1972 Summer Olympic Games, he won seven gold medals.
- (A) Games, he won seven gold medals
  - (B) Games, winning seven gold medals
  - (C) Games by winning seven gold medals
  - (D) Games; therefore, he won seven gold medals
  - (E) Games; seven gold medals were won by him



11. A pioneer in the nursing field, Florence Nightingale's insistence on sanitary conditions in hospitals increased patients' survival rates considerably.
- (A) Florence Nightingale's insistence on sanitary conditions in hospitals
  - (B) Florence Nightingale's insistence on sanitary conditions in hospitals, which
  - (C) Florence Nightingale insisted on sanitary conditions in hospitals and thereby
  - (D) by insisting on sanitary conditions in hospitals is how Florence Nightingale
  - (E) the sanitary conditions in hospitals that Florence Nightingale insisted on
12. Perched atop a sandstone mesa, Acoma Pueblo is the oldest inhabited community in North America, currently a population of about fifteen families.
- (A) America, currently a population of
  - (B) America, and its population currently
  - (C) America, currently its population is
  - (D) America, whose current population is
  - (E) America and currently has a population of
13. After college Susan King founded a publishing company but eventually reduced her role in the firm to pursue her interests in storytelling and art by creating her own books.
- (A) company but eventually reduced
  - (B) company but eventually reducing
  - (C) company, and eventually reducing
  - (D) company, she eventually reduced
  - (E) company, however, she eventually reduced
14. Were they to be told the purpose of the study, the participants might find it difficult to answer the questions spontaneously.
- (A) Were they to be told
  - (B) If they would have been told
  - (C) With it being told them
  - (D) Telling them
  - (E) By telling them

## S T O P

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.

Correct Answers and Difficulty Levels  
Form Code MFSW

## Critical Reading

Section 4			Section 7			Section 9		
COR. DIFF. ANS. LEV.			COR. DIFF. ANS. LEV.			COR. DIFF. ANS. LEV.		
1.	C	1	13.	C	1	13.	D	2
2.	C	3	14.	C	4	2.	D	1
3.	E	2	15.	A	3	3.	B	2
4.	B	3	16.	A	5	14.	C	3
5.	E	3	17.	D	3	15.	A	1
6.	B	3	18.	A	3	16.	E	3
7.	E	4	19.	D	4	17.	E	3
8.	E	5	20.	D	1	18.	A	2
9.	B	4	21.	C	2	19.	A	4
10.	D	2	22.	B	3	20.	D	4
11.	B	5	23.	A	3	21.	E	4
12.	E	4	24.	C	3	22.	A	2
						23.	B	3
						24.	C	3
Number correct			Number correct			Number correct		
Number incorrect			Number incorrect			Number incorrect		

## Mathematics

Section 2				Section 5				Section 8			
Multiple-Choice Questions		Student-Produced Response Questions		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.	
	COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.
1. A	1	9. 90	1	1. E	1	11. C	3	1. C	1	9. C	3
2. B	1	10. 1/2,.5	3	2. D	1	12. A	3	2. A	2	10. B	3
3. C	2	11. 120<=x<=150	2	3. B	1	13. B	3	3. E	1	11. B	3
4. D	2	12. 8	2	4. A	1	14. D	3	4. D	2	12. B	3
5. C	3	13. 158	3	5. A	2	15. C	3	5. E	2	13. D	4
6. B	3	14. 8	3	6. B	1	16. C	3	6. B	2	14. A	4
7. A	4	15. 12	4	7. B	3	17. D	4	7. E	2	15. E	4
8. D	4	16. 3/7,.428,.429	4	8. C	3	18. B	4	8. A	3	16. D	5
		17. 1491	4	9. D	3	19. E	4				
		18. 65	5	10. A	3	20. E	5				
Number correct				Number correct				Number correct			
(9-18)											
Number incorrect				Number incorrect				Number incorrect			

## Writing Multiple-Choice

Section 3				Section 10					
COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.		COR. DIFF. ANS. LEV.	
1. B 1	10. B 5	19. B 3	28. D 5	1. B 1	6. B 1	11. C 4			
2. B 1	11. C 5	20. B 3	29. C 5	2. E 1	7. E 3	12. E 4			
3. A 2	12. D 1	21. C 3	30. D 1	3. E 1	8. A 2	13. A 4			
4. D 3	13. B 2	22. E 3	31. C 3	4. C 1	9. E 2	14. A 5			
5. E 2	14. C 2	23. B 3	32. D 3	5. B 1	10. B 3				
6. A 2	15. C 2	24. B 4	33. B 3						
7. D 2	16. A 2	25. A 4	34. E 3						
8. D 4	17. D 3	26. D 5	35. E 4						
9. D 4	18. E 2	27. D 4							
Number correct				Number correct					
Number incorrect				Number incorrect					

**NOTE:** Difficulty levels are estimates of question difficulty for a reference group of college-bound seniors. Difficulty levels range from 1 (easiest) to 5 (hardest).

# The Scoring Process

1. **Scanning.** Your answer sheet is scanned electronically, and the circle you filled in for each question is recorded in a computer file.
2. **Scoring.** The computer compares the circle filled in for each question with the correct response.
  - Each correct answer receives one point.
  - Omitted questions do not count toward your score.
  - One-fourth of a point is subtracted for each wrong answer to multiple-choice questions. No points are subtracted for wrong answers to the student-produced response mathematics questions.

**Example:**

The critical reading section, for example, has 67 questions. If you have 37 right, 28 wrong, and 2 omitted, the resulting raw score of 30 is determined as follows:

$$37 - 28 (1/4) = 37 - 7 = 30$$

- If the raw score is a fractional number, it is rounded to the nearest whole number. For example, a raw score of 36.25 is rounded to 36, the nearest whole number. A raw score of 36.50 is rounded upward to 37.
3. **Essay scoring.** Using the scoring guide shown on page 51, specially trained high school and college teachers score the essay. Each essay is read independently by two readers who rate it on a scale of 1 to 6. (If the two scores differ by more than one point, a third reader scores the essay.) The two readers' scores are added together, and the essay subscore is reported on a scale of 2 to 12. The essay section is worth approximately 30 percent of the raw score, and the multiple-choice writing section counts for approximately 70 percent.
  4. **Converting raw scores to scaled scores.** Raw scores are then placed on the scale of 200–800 through a process that adjusts scores to account for minor differences in difficulty among different editions of the test. This process, known as equating, is performed so that a student's reported score is not affected by the edition of the test taken or by the abilities of the group with whom the student takes the test. As a result of placing SAT scores on the College Board scale, scores earned by students at different times can be compared. For example, an SAT mathematics score of 400 on a test taken at one administration indicates the same level of developed mathematics ability as a 400 score obtained on a different edition of the test taken at another time.

# SAT Essay Scoring Guide

## SCORE OF 6

An essay in this category demonstrates *clear and consistent mastery*, although it may have a few minor errors. A typical essay

- effectively and insightfully develops a point of view on the issue and demonstrates outstanding critical thinking, using clearly appropriate examples, reasons, and other evidence to support its position
- is well organized and clearly focused, demonstrating clear coherence and smooth progression of ideas
- exhibits skillful use of language, using a varied, accurate, and apt vocabulary
- demonstrates meaningful variety in sentence structure
- is free of most errors in grammar, usage, and mechanics

## SCORE OF 3

An essay in this category demonstrates *developing mastery*, and is marked by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue, demonstrating some critical thinking, but may do so inconsistently or use inadequate examples, reasons, or other evidence to support its position
- is limited in its organization or focus, or may demonstrate some lapses in coherence or progression of ideas
- displays developing facility in the use of language, but sometimes uses weak vocabulary or inappropriate word choice
- lacks variety or demonstrates problems in sentence structure
- contains an accumulation of errors in grammar, usage, and mechanics

## SCORE OF 5

An essay in this category demonstrates *reasonably consistent mastery*, although it will have occasional errors or lapses in quality. A typical essay

- effectively develops a point of view on the issue and demonstrates strong critical thinking, generally using appropriate examples, reasons, and other evidence to support its position
- is well organized and focused, demonstrating coherence and progression of ideas
- exhibits facility in the use of language, using appropriate vocabulary
- demonstrates variety in sentence structure
- is generally free of most errors in grammar, usage, and mechanics

## SCORE OF 2

An essay in this category demonstrates *little mastery*, and is flawed by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue that is vague or seriously limited, and demonstrates weak critical thinking, providing inappropriate or insufficient examples, reasons, or other evidence to support its position
- is poorly organized and/or focused, or demonstrates serious problems with coherence or progression of ideas
- displays very little facility in the use of language, using very limited vocabulary or incorrect word choice
- demonstrates frequent problems in sentence structure
- contains errors in grammar, usage, and mechanics so serious that meaning is somewhat obscured

## SCORE OF 4

An essay in this category demonstrates *adequate mastery*, although it will have lapses in quality. A typical essay

- develops a point of view on the issue and demonstrates competent critical thinking, using adequate examples, reasons, and other evidence to support its position
- is generally organized and focused, demonstrating some coherence and progression of ideas
- exhibits adequate but inconsistent facility in the use of language, using generally appropriate vocabulary
- demonstrates some variety in sentence structure
- has some errors in grammar, usage, and mechanics

## SCORE OF 1

An essay in this category demonstrates *very little or no mastery*, and is severely flawed by ONE OR MORE of the following weaknesses:

- develops no viable point of view on the issue, or provides little or no evidence to support its position
- is disorganized or unfocused, resulting in a disjointed or incoherent essay
- displays fundamental errors in vocabulary
- demonstrates severe flaws in sentence structure
- contains pervasive errors in grammar, usage, or mechanics that persistently interfere with meaning

Essays not written on the essay assignment will receive a score of zero.

# Scoring Worksheet for Form Code MFSW

From your responses on your QAS report, fill in the blanks below and do the calculations to get your critical reading, mathematics and writing raw scores. Use the tables on the following pages to find your scaled scores.

## Get Your Critical Reading Score

How many critical reading questions did you get **right**?

Section 4: Questions 1–24 \_\_\_\_\_

Section 7: Questions 1–24 + \_\_\_\_\_

Section 9: Questions 1–19 + \_\_\_\_\_

Total = \_\_\_\_\_ (A)

How many critical reading questions did you get **wrong**?

Section 4: Questions 1–24 \_\_\_\_\_

Section 7: Questions 1–24 + \_\_\_\_\_

Section 9: Questions 1–19 + \_\_\_\_\_

Total = \_\_\_\_\_

$\times 0.25 =$  \_\_\_\_\_ (B)

A – B = \_\_\_\_\_  
Critical Reading  
Raw Score

Round the critical reading raw score to the nearest whole number.

Use the table on page 53 to find your critical reading scaled score.

## Get Your Mathematics Score

How many mathematics questions did you get **right**?

Section 2: Questions 1–18 \_\_\_\_\_

Section 5: Questions 1–20 + \_\_\_\_\_

Section 8: Questions 1–16 + \_\_\_\_\_

Total = \_\_\_\_\_ (A)

How many **multiple-choice** mathematics questions did you get **wrong**?

Section 2: Questions 1–8 \_\_\_\_\_

Section 5: Questions 1–20 + \_\_\_\_\_

Section 8: Questions 1–16 + \_\_\_\_\_

Total = \_\_\_\_\_

$\times 0.25 =$  \_\_\_\_\_ (B)

A – B = \_\_\_\_\_  
Mathematics Raw Score

Round the mathematics raw score to the nearest whole number.

Use the table on page 53 to find your mathematics scaled score.

## Get Your Writing Score

How many multiple-choice writing questions did you get **right**?

Section 3: Questions 1–35 \_\_\_\_\_

Section 10: Questions 1–14 + \_\_\_\_\_

Total = \_\_\_\_\_ (A)

How many multiple-choice writing questions did you get **wrong**?

Section 3: Questions 1–35 \_\_\_\_\_

Section 10: Questions 1–14 + \_\_\_\_\_

Total = \_\_\_\_\_

$\times 0.25 =$  \_\_\_\_\_ (B)

A – B = \_\_\_\_\_  
Writing Multiple-Choice  
Raw Score

Round the writing multiple-choice raw score to the nearest whole number.

\_\_\_\_\_ (C)

Use the table on page 53 to find your writing multiple-choice scaled score.

Copy your essay score from your QAS report.

\_\_\_\_\_ (D)

Use the writing composite table (page 54) for your form code and look up your writing multiple-choice raw score (C) and your essay score (D) to find your writing composite scaled score.



# SAT Score Conversion Table

## Form Code MFSW

Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score	Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score
67	800			31	490	540	56
66	800			30	490	530	55
65	800			29	480	520	54
64	780			28	480	510	53
63	760			27	470	500	52
62	740			26	460	490	51
61	730			25	460	490	50
60	720			24	450	480	49
59	710			23	440	470	48
58	700			22	440	460	47
57	690			21	430	450	46
56	680			20	430	450	46
55	670			19	420	440	45
54	660	800		18	410	430	44
53	650	780		17	410	420	43
52	640	760		16	400	410	42
51	630	740		15	390	410	41
50	620	720		14	380	400	40
49	610	710	80	13	380	390	39
48	610	700	80	12	370	380	38
47	600	690	79	11	360	370	38
46	590	680	76	10	350	360	37
45	580	670	73	9	340	350	36
44	580	660	71	8	330	340	35
43	570	650	70	7	320	330	34
42	560	640	68	6	310	320	32
41	560	630	67	5	300	310	31
40	550	620	66	4	290	290	30
39	540	610	64	3	270	280	29
38	540	600	63	2	250	260	27
37	530	590	62	1	240	240	26
36	520	580	61	0	220	220	24
35	520	580	60	-1	200	200	22
34	510	570	59	-2	200	200	20
33	510	560	58	and			
32	500	550	57	below			

This table is for use only with the test in this booklet.

# SAT Writing Composite Score Conversion Table

## Form Code MFSW

Writing MC Raw Score	Essay Raw Score											
	12	11	10	9	8	7	6	5	4	3	2	0
49	800	800	800	800	780	770	750	730	720	710	690	680
48	800	800	800	790	770	750	730	720	710	690	670	670
47	800	800	790	770	750	730	720	700	690	670	660	650
46	790	780	760	750	720	700	690	670	660	640	630	620
45	770	760	740	730	700	690	670	650	640	630	610	600
44	760	740	730	710	690	670	650	640	630	610	590	590
43	750	730	710	700	680	660	640	630	610	600	580	570
42	730	720	700	690	660	640	630	610	600	580	570	560
41	720	710	690	670	650	630	620	600	590	570	560	550
40	710	690	680	660	640	620	610	590	580	560	550	540
39	700	680	670	650	630	610	600	580	570	550	540	530
38	690	670	660	640	620	600	590	570	560	540	530	520
37	680	660	650	630	610	590	580	560	550	530	520	510
36	670	660	640	620	600	580	570	550	540	520	510	500
35	660	650	630	610	590	570	560	540	530	510	500	490
34	650	640	620	610	580	560	550	530	520	510	490	480
33	650	630	610	600	580	560	540	520	510	500	480	470
32	640	620	600	590	570	550	530	520	500	490	470	460
31	630	610	600	580	560	540	520	510	500	480	460	460
30	620	600	590	570	550	530	520	500	490	470	460	450
29	610	600	580	560	540	520	510	490	480	460	450	440
28	600	590	570	560	540	520	500	480	470	460	440	430
27	600	580	570	550	530	510	490	480	460	450	430	420
26	590	570	560	540	520	500	490	470	460	440	420	420
25	580	570	550	530	510	490	480	460	450	430	420	410
24	570	560	540	530	500	490	470	450	440	430	410	400
23	570	550	540	520	500	480	460	450	430	420	400	390
22	560	540	530	510	490	470	460	440	430	410	390	390
21	550	540	520	500	480	460	450	430	420	400	390	380
20	550	530	510	500	480	460	440	420	410	400	380	370
19	540	520	510	490	470	450	430	420	400	390	370	370
18	530	510	500	480	460	440	430	410	400	380	370	360
17	520	510	490	480	450	430	420	400	390	370	360	350
16	520	500	480	470	450	430	410	400	380	370	350	340
15	510	490	480	460	440	420	400	390	380	360	340	340
14	500	490	470	450	430	410	400	380	370	350	340	330
13	490	480	460	450	420	410	390	370	360	350	330	320
12	490	470	450	440	420	400	380	370	350	340	320	310
11	480	460	450	430	410	390	370	360	350	330	310	310
10	470	460	440	420	400	380	370	350	340	320	310	300
9	460	450	430	410	390	370	360	340	330	310	300	290
8	450	440	420	410	390	370	350	330	320	310	290	280
7	450	430	410	400	380	360	340	330	310	300	280	270
6	440	420	410	390	370	350	330	320	300	290	270	260
5	430	410	400	380	360	340	320	310	290	280	260	250
4	420	400	380	370	350	330	310	300	280	270	250	240
3	410	390	370	360	340	320	300	280	270	260	240	230
2	390	380	360	350	320	300	290	270	260	240	230	220
1	380	360	350	330	310	290	280	260	250	230	220	210
0	370	350	330	320	300	280	260	240	230	220	200	200
-1	350	330	320	300	280	260	250	230	220	200	200	200
-2	330	320	300	280	260	240	230	210	200	200	200	200
-3	310	300	280	270	250	230	210	200	200	200	200	200
-4	310	290	280	260	240	220	200	200	200	200	200	200
and below												

This table is for use only with the test in this booklet.