

Form Codes AEGC, BWGC, CFGC

CollegeBoard

The SAT®

Question-and-Answer Service

May 2010 Administration

INSIDE:

- Test questions and correct answers
- The difficulty level of each question
- Your essay prompt—just like the essay prompt administered on your test day
- Instructions for scoring your test
- Suggestions for using this report

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SAT®

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

This booklet contains the SAT® you took in May 2010, 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 misplayed 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 www.collegeboard.com/mysat. 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.com/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

The best way to prepare for the SAT is to take challenging high school classes, read extensively and practice writing as often as possible. Also check out the College Board's free and affordable practice tools for the SAT, such as The Official Question of the Day™, and be sure to visit SAT Skills Insight™ at www.collegeboard.com/satskillsinsight. It provides you with the types of skills that are tested on the SAT, suggestions for improvement and sample SAT questions and answers to help you do better in the classroom, on the test and in college. When you are ready, you can register to take the SAT again at www.collegeboard.com/mysat.

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
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 make decisions all the time. Some of these decisions may seem to be minor and inconsequential—whether to read a book or to not attend a meeting—while others are obviously more important. But even though the important decisions are likely to have equally important consequences, people should not treat casually or overlook the small decisions. The so-called small decisions have the greatest impact on our lives.

Assignment: Do small decisions often have major consequences? 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.
Do not turn to any other section in the test.**

1 ESSAY

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ESSAY 1

ESSAY Time — 25 minutes

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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.

A well-known company recently proposed setting aside every Friday as a day with no e-mail-based communication. On these e-mail-free Fridays, employees would be encouraged to refrain completely from reading or sending e-mail or text messages and advised instead to call each other or talk in person. This idea can work for everyone. If each week we set aside time to actually talk to one another, our communications will be less impersonal and more effective and satisfying.

Assignment: Is talking the most effective and satisfying way of communicating with others? 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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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.

Our distant ancestors survived because they were physically active, hunting wild animals and gathering fruits and vegetables over large areas of land. Modern life, however, is characterized by physical inactivity. Given the resulting health problems and the tremendous cost of treating them, the government should work with schools and businesses to ensure that people eat the right foods and get enough exercise each day.

Assignment: Should the government be responsible for making sure that people lead healthy lives? 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.

In business, the term “personal brand” describes how companies define themselves and differentiate their products from those of other companies. People, too, are often advised to develop a kind of personal brand or style—to make themselves stand out from other people by developing unique characteristics. Nowadays, people who want to be successful in school, at work, or in their personal relationships must emphasize their differences from their peers in the same way that companies emphasize their differences from their competitors.

Assignment: Do people succeed by emphasizing their differences from other people? 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.
Do not turn to any other section in the test.



SECTION 2

Time — 25 minutes

24 Questions

Turn to Section 2 (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.

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) (E)

1. Unsuccessful in her first campaigns, Barbara Jordan -----, eventually becoming the first Black woman elected to the Texas State Senate.
 (A) persisted (B) gloated (C) retired
 (D) despaired (E) hesitated
2. Some scientists speculate that children who wash frequently are more likely to become asthmatic than those who wash infrequently: that -----, not the lack of it, is the problem.
 (A) pollution (B) negligence (C) nutrition
 (D) misbehavior (E) cleanliness
3. Newspaper advertisers feel their messages are more believable and ----- when they are printed next to news reports; hence, advertising charges are higher for such -----.
 (A) dominant . . investigation
 (B) irrelevant . . proximity
 (C) precise . . delivery
 (D) persuasive . . positioning
 (E) vague . . thoroughness

4. Despite accusations to the contrary, it is unlikely that he intended to ----- the articles, since he cited them in his bibliography.
 (A) analyze (B) illuminate (C) plagiarize
 (D) acknowledge (E) contradict
5. Ralph Ellison learned the hard way about the ----- of a written manuscript: he suffered the ----- of the only draft of a work in progress in a household fire.
 (A) magnitude . . isolation
 (B) fragility . . preservation
 (C) illegibility . . eradication
 (D) vulnerability . . destruction
 (E) proliferation . . division
6. The new human resources director is both ----- and ----- about being able to improve employment opportunities for women at the executive level: she has great resolve but harbors no illusions.
 (A) practical . . deceptive
 (B) cynical . . irrational
 (C) excited . . approachable
 (D) uncooperative . . naive
 (E) determined . . realistic
7. Years of neglect had left the inside of the building in ----- condition: workstations were filthy and furnishings were dilapidated.
 (A) a squalid (B) a volatile (C) an undaunted
 (D) a rudimentary (E) a cataclysmic
8. *The Wild Parrots of Telegraph Hill* is only ----- about birds; despite its title, the documentary actually examines human relationships.
 (A) ostensibly (B) distinctively (C) intelligibly
 (D) saliently (E) incontrovertibly



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 9-10 are based on the following passage.

Line At a preconcert interview in 2000 for the performance of one of her works in London, Rhian Samuel was asked about her well-known reluctance to be considered a Welsh composer. Her reply—"I'm not so happy to be called only Line 5 a Welsh composer because I haven't lived in Wales all my life and have other influences as well. On the other hand, I [have] been a woman all my life!"—brought both laughter and applause from the expectant crowd of concertgoers. In short, Samuel is proud to be considered first a woman Line 10 composer, one whose connection to the Welsh language and people resurfaces at interludes throughout her musical life.

9. The primary purpose of the passage is to

- (A) discuss a composer's musical training
- (B) clarify a musician's self-perception
- (C) describe an artist's linguistic talents
- (D) reveal the preferences of a particular audience
- (E) reconcile two antithetical views of a performance

10. Her "reply" in lines 4-7 suggests chiefly that Samuel believes which of the following?

- (A) Her nationality is not the most important aspect of her identity.
- (B) She could not have become a successful composer if she had remained in Wales for her whole life.
- (C) One of the obligations of a musician is to relate a humorous anecdote before each performance.
- (D) Other people should not refer to themselves as Welsh unless they have always lived in Wales.
- (E) Men should acknowledge the importance of their gender as an artistic influence just as women do.

Questions 11-12 are based on the following passage.

Line My daughter, Olivia, and I were going to college. Not together at the same school, thank goodness, just at the same time, but she didn't exactly know about my Line 5 plans yet. There were a few things that needed work in this arrangement. Any mother who has an eighteen-year-old daughter would completely understand why I didn't mention my decision to go back to college to Olivia. What? I can't believe it. Are you actually copying me? Don't you think you should consider getting your own life? It wasn't that I planned never to tell her. I just figured I'd wait a bit—until we'd had a little time to miss each other.

11. The narrator's attitude toward her situation is best described as

- (A) perplexed
- (B) prudent
- (C) sentimental
- (D) annoyed
- (E) derisive

12. The narrator uses the questions in lines 8-10 primarily to

- (A) voice some pressing concerns
- (B) admit to some personal qualms
- (C) characterize a likely response
- (D) highlight an unpleasant memory
- (E) begin a discussion



Questions 13–24 are based on the following passages.

These passages discuss string theory, the as-yet-unproven idea that all matter in the universe is made up of “strings” so small that they have not been detected by instruments. The passages were adapted from books published in 2000 and 2006, respectively.

Passage 1

String theory is a work in progress whose partial completion has already revealed remarkably elegant answers to questions about nature’s most fundamental constituents and forces. For instance, in string theory many aspects of nature that might appear to be arbitrary technical details—such as the number of distinct varieties of particle ingredients and their properties—are found to arise from tangible aspects of the geometry of the universe.

In the final analysis, though, nothing is a substitute for definitive, testable predictions that can determine whether string theory has truly lifted the veil of mystery hiding the deepest truths of our universe. It may be some time before our level of comprehension has reached sufficient depth to achieve this aim. In fact, the mathematics of string theory is so complicated that, to date, no one even knows the exact equations of the theory. Nevertheless, experimental tests could provide strong circumstantial support for string theory within the next ten years or so.

One of the pioneers of string theory summarizes the situation by saying that “string theory is a part of twenty-first-century physics that fell by chance into the twentieth century.” It is as if our forebears in the nineteenth century had been presented with a modern-day supercomputer, without the operating instructions. Through inventive trial and error, hints of the supercomputer’s power would have become evident, but it would have taken vigorous and prolonged effort to gain true mastery. The hints of the computer’s potential, like our glimpses of string theory’s explanatory power, would have provided strong motivation for obtaining complete facility. A similar motivation today energizes physicists to pursue string theory.

Science proceeds in fits and starts. Scientists put forward results, both theoretical and experimental. The results are then debated by the community; sometimes they are discarded, sometimes they are modified, and sometimes they provide inspiration for new and more accurate ways of understanding the universe. In other words, science proceeds along a zigzag path toward what we hope will be ultimate truth, a path that began with humanity’s earliest attempts to fathom the cosmos and whose end we cannot predict. Whether string theory is an incidental rest stop along this path, a landmark turning point, or the final destination we do not know. But the last two decades of research by hundreds of dedicated physicists and mathematicians has given us well-founded hope that we are on the right and possibly final track.

Passage 2

No matter how things turn out, the story of string theory is an episode with no parallel in the history of modern physics. More than twenty years of research by thousands of the world’s best scientists producing tens of thousands of scientific papers has not led to a single testable experimental prediction of the theory. This unprecedented situation leads one to ask whether one can really describe string theory as science.

Human beings engage in many different attempts to explain the world around them, but only a specific sort of explanation is normally considered to be scientific. An explanation that allows one to predict successfully in detail what will happen when one goes out and performs a feasible experiment is the sort of explanation that most clearly can be labeled “scientific.” Explanations that cannot be used to form predictions clearly do not deserve this label.

Remarkably, the lack of any progress in achieving a predictive version of string theory that could be tested by experiment has not led to theorists’ giving it up. Indeed, in recent years, many string theorists have become convinced that string theory inherently must allow an astronomically large number of physical possibilities, so many that it is difficult to see how the theory can ever be tested. Yet some theorists are convinced that a better understanding of the theory will uncover testable phenomena. This way of thinking is a steadfast refusal to acknowledge the lesson that conventional science says one should draw in this kind of circumstance: if one’s theory can’t predict anything, one should try something else.

The phrase “not even wrong” is popular among physicists. A theory can be “not even wrong” because it is so incomplete and ill-defined that it can’t be used to make predictions whose failure would show it to be wrong. This sort of “not even wrong” is not necessarily a bad thing. Most new theoretical ideas begin in this state, and it can take quite a bit of work before their implications are well enough understood for researchers to be able to tell whether the idea is right or wrong. But there is a second connotation of “not even wrong”: something worse than a wrong idea. In the case of string theory, the way some physicists are abandoning fundamental scientific principles rather than admit that a theory is wrong is something of this kind: worse than being wrong is refusing to admit when one is wrong.



13. Which best describes the relationship between the two passages?
- Passage 1 provides concrete evidence in support of a hypothesis attacked in Passage 2.
 - Passage 1 advocates a theoretical approach that is only reluctantly endorsed by Passage 2.
 - Passage 1 praises the achievements of a scientific researcher who is denounced in Passage 2.
 - Passage 1 offers a largely positive assessment of a theory that is criticized in Passage 2.
 - Passage 1 offers a detailed description of a methodology that is praised in Passage 2.
14. The author of Passage 2 would most likely respond to the claim in lines 9-12 in Passage 1 (“In the . . . universe”) with
- complete agreement
 - amused toleration
 - deliberate neutrality
 - open skepticism
 - total opposition
15. The author of Passage 2 would most likely argue that the prediction made in lines 16-18 in Passage 1 (“Nevertheless . . . or so”) is
- unlikely to come to pass
 - based on relevant data
 - a patently obvious claim
 - a somewhat plausible outcome
 - an unnecessarily pessimistic assessment
16. In the analogy of the supercomputer (lines 22-30), modern physicists resemble the “forebears” in that both
- have an obligation to acknowledge their own limitations
 - lack the knowledge to take full advantage of a tool
 - fail to recognize the complexity of a challenge
 - must learn to use computers to do their work more effectively
 - should seek instruction to understand a phenomenon more fully
17. In line 32, “fits” most nearly means
- violent attacks
 - unprovoked tantrums
 - emotional reactions
 - unexpected whims
 - sudden bursts
18. The characterization of the “path” (line 38) suggests that science
- results from purely chance events
 - is driven by an unforeseen and mysterious purpose
 - progresses in an orderly manner
 - is inaccessible to those without proper training
 - advances in indirect and sometimes unexpected ways
19. The author of Passage 2 would most likely advise the “physicists and mathematicians” referred to in lines 44-45, Passage 1, to
- redouble their current efforts
 - collaborate more with one another
 - find new avenues for research
 - pursue a more interdisciplinary approach
 - seek to replicate their experimental findings
20. The primary contrast in lines 47-52 (“No matter . . . theory”) is between the
- size of a project and its importance
 - purpose of an undertaking and its result
 - history of an enterprise and its future
 - scope of an endeavor and its outcome
 - randomness of an approach and its findings
21. Passage 1 suggests that its author would most likely argue that the “unprecedented situation” (lines 52-53, Passage 2) is
- proof of the arbitrary nature of theoretical physics
 - evidence of the lack of consensus among physicists
 - a sign of the challenges involved with working with supercomputers
 - a testament to the difficulty of directly observing subatomic phenomena
 - a consequence of the highly complex mathematics underlying string theory
22. The second paragraph in Passage 2 (lines 55-63) primarily serves to
- analyze the steps required by a process
 - assess the practicality of achieving an objective
 - articulate the criteria required to meet a standard
 - characterize the qualifications of practitioners
 - describe the significant advancements of a discipline

2



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2

23. In line 74, "draw" most nearly means

- (A) sketch
- (B) lead
- (C) attract
- (D) infer
- (E) provoke

24. Both authors would agree with which statement about string theory?

- (A) Through its development, important technological advances have taken place.
- (B) In its current state, the explanations it provides are ultimately incomplete.
- (C) It is unlikely that it will ever provide an encompassing explanation.
- (D) It is beginning to be challenged by the majority of scientists.
- (E) It represents our best chance of understanding subatomic phenomena.

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.



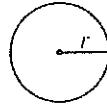
SECTION 4
Time — 25 minutes
18 Questions

Turn to Section 4 (page 5) 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.

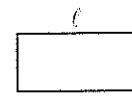
- Notes**
1. The use of a calculator is permitted.
 2. All numbers used are real numbers.
 3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the 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

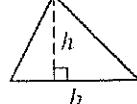


$$A = \pi r^2$$

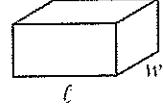
$$C = 2\pi r$$



$$A = l w$$



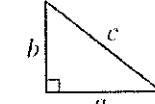
$$A = \frac{1}{2} b h$$



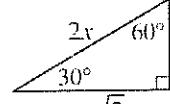
$$V = l w h$$



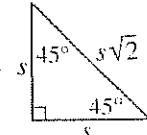
$$V = \pi r^2 h$$



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



$$\text{Special Right Triangles}$$



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 4 multiplied by a number is equal to 6, what is the number?
 (A) $\frac{1}{3}$
 (B) $\frac{1}{2}$
 (C) $\frac{2}{3}$
 (D) $\frac{3}{4}$
 (E) $\frac{3}{2}$
2. In the xy -coordinate plane, which of the following points is a distance of 6 from $(0, 0)$?
 (A) $(6, 0)$
 (B) $(5, -1)$
 (C) $(4, 2)$
 (D) $(-2, 4)$
 (E) $(-3, -3)$

GO ON TO THE NEXT PAGE



SHOWER SHOW...

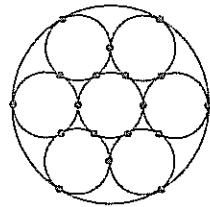
3. In the pattern above, the first letter is S and the letters S, H, O, W, E, and R repeat continually in that order. What is the 65th letter in the pattern?
- (A) S
(B) H
(C) W
(D) E
(E) R

RENTAL COST

Hours	Store A	Store B
1	\$8.00	\$13.00
2	\$11.50	\$15.50
3	\$15.00	\$18.00
4	\$18.50	\$20.50

4. The table above shows the cost of renting a piece of equipment from stores A and B. Each store charges a larger amount for the first hour and a smaller constant amount for each additional hour. For what number of hours will the two stores charge the same amount?
- (A) 6
(B) 7
(C) 8
(D) 9
(E) 10

5. Which of the following is NOT a solution of the equation $y^2 = x + x + x + x$?
- (A) $x = 4, y = 4$
(B) $x = 4, y = -4$
(C) $x = 8, y = 16$
(D) $x = 16, y = 8$
(E) $x = 25, y = 10$



6. In the figure above, the seven small circles, which have equal radii, and the large circle are tangent at the indicated points. If the area of the large circle is 36π , what is the area of one of the small circles?
- (A) 3π
(B) $\frac{24}{7}\pi$
(C) 4π
(D) $\frac{32}{7}\pi$
(E) $\frac{36}{7}\pi$



7. On the number line, point P has coordinate $\frac{1}{2}$, and point Q has coordinate 2. If point R is $\frac{1}{4}$ of the way from P to Q , what is the coordinate of R ?
- (A) $\frac{3}{4}$
(B) $\frac{7}{8}$
(C) 1
(D) $\frac{9}{8}$
(E) $\frac{5}{4}$

8. If v and x are positive integers such that $v = \frac{7}{3}b$ and $b = \frac{x^2}{2}$, what is the least possible value of v ?
- (A) 14
(B) 21
(C) 28
(D) 35
(E) 42



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

Grid in result.

Answer: 2.5

Fraction
line

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

Decimal
point

Answer: 201

Either position is correct.

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

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 $\frac{7}{2}$. (If $\boxed{3} \boxed{1} \boxed{/} \boxed{2}$ 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	1	3
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
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

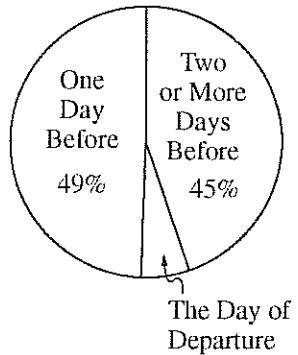
9. One day last week, Sam worked 4 hours and Teresa worked 3 hours. For their combined hours worked, Sam and Teresa were paid a total of \$54.60. If they are paid at the same hourly rate, what is the amount, in dollars, each is paid per hour? (Disregard the \$ sign when gridding your answer. For example, if your answer is \$1.37, grid 1.37)

$$3 < 2x < 11$$

10. If x is an integer that satisfies the inequalities above, what is one possible value of $3x$?



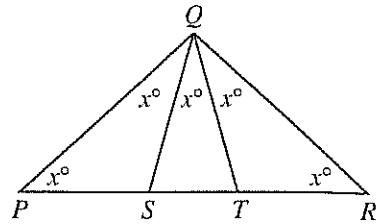
**WHEN DO VACATIONERS
PACK FOR A TRIP?**



11. The circle graph above shows the results of a survey taken at an airport. In the survey, 1200 vacationers stated when they packed for their trip. How many stated that they packed on the day of departure?

$$\begin{aligned}f(x) &= x^2 \\g(x) &= f(x) + 2\end{aligned}$$

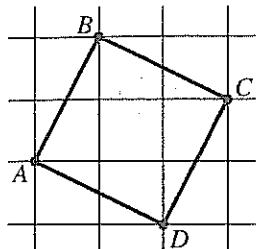
12. The functions f and g are defined above. What does $g(10)$ equal?



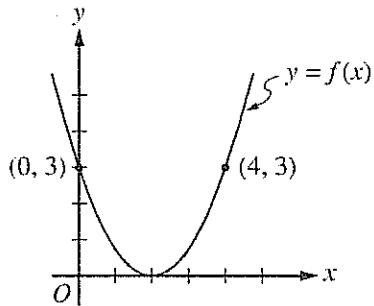
Note: Figure not drawn to scale.

13. In triangle PQR above, what is the value of x ?

14. A bakery sells 4 different types of bread. How many combinations of 3 different types of bread can a customer buy from this bakery?



15. In the figure above, each of the smallest squares on the grid has sides of length 1. What is the area of square $ABCD$?



16. The figure above shows the graph of the function f , where $f(x) = a(x - 2)^2$ for some constant a . What is the value of a ?

17. A rectangular solid has length 20 centimeters, width 5 centimeters, and height 10 centimeters. How many of these rectangular solids when combined have a volume of 1 cubic meter? (1 meter = 100 centimeters)

18. What is the greatest four-digit integer that meets the following three restrictions?
1. All of the digits are different.
 2. The greatest digit is the sum of the other three digits.
 3. The product of the four digits is divisible by 10 and not equal to zero.

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.

SECTION 5

Time — 25 minutes

24 Questions

Turn to Section 5 (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 E

1. Heckling during a political rally is so ----- that it surprises no one; the same behavior, however, is ----- when it is exhibited at a scientific conference.
 - (A) rare . . shattering
 - (B) commonplace . . startling
 - (C) revolting . . unnerving
 - (D) trivial . . meaningless
 - (E) comical . . bearable

2. Steve was ----- by the intricacy of the ice crystals forming on his windowpane: he couldn't take his eyes off them.
 - (A) edified
 - (B) troubled
 - (C) enervated
 - (D) emboldened
 - (E) captivated
3. The experiment did not yield the decisive ----- that the scientist had hoped for; instead, the findings were only of ----- significance.
 - (A) outcome . . nominal
 - (B) results . . influential
 - (C) conclusion . . distinct
 - (D) sources . . astronomical
 - (E) risks . . questionable
4. NASA engineer Gloria Yamauchi uses ----- approach to research, in that it draws on physics, aerodynamics, mathematics, and other fields.
 - (A) a self-evident
 - (B) an interdisciplinary
 - (C) a simplistic
 - (D) an economical
 - (E) an impractical
5. Less confident employees tend to be ----- about asking for a pay increase, preferring to wait for their supervisors to raise the issue.
 - (A) voluble
 - (B) presumptuous
 - (C) reticent
 - (D) penitent
 - (E) tenacious



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

Liars may betray themselves through linguistic mistakes, but the main sources of betrayal are the emotions. Emotion reveals itself, sometimes in contradictory ways, in the voice, body, and face. Deceptions typically involve trying to conceal feelings that are inappropriate or trying to cover up the fear, guilt, and distress that may be provoked when one attempts to get away with a lie. When a person lies and has an emotional investment in the situation, a perfect performance is hard to carry off. Nonverbal clues to deception leak out. What is surprising is that few people make use of these clues and thus liars go undetected.

Passage 2

Human beings are terrible lie detectors. In studies, subjects asked to distinguish truth from lies answer correctly approximately half the time. People are often led astray by an erroneous sense of how a liar behaves. “People hold a stereotype of the liar—as tormented, anxious, and conscience-stricken,” researchers Bella DePaulo and Charles Bond write. Clumsy deceivers are sometimes visibly agitated, but in general there is no such thing as “typical” deceptive behavior. As DePaulo says, “To be a good liar, you don’t need to know what behaviors really separate liars from truth tellers, but what behaviors people *think* separate them.”

6. Which best describes the relationship between the passages?

- (A) Passage 1 discusses lying from a moral stance, whereas Passage 2 examines it from a legal viewpoint.
- (B) Passage 1 views lying as a skill that is learned, whereas Passage 2 considers it an instinctive impulse.
- (C) Passage 1 claims that lying is characterized by certain distinctive behaviors, whereas Passage 2 largely rejects that notion.
- (D) Passage 1 takes a scientific approach to lying, whereas Passage 2 discusses it from an anecdotal perspective.
- (E) Passage 1 focuses on the effects of lying, whereas Passage 2 examines its causes.

7. Lines 1-2, Passage 1 (“Liars may . . . emotions”), and lines 18-20, Passage 2 (“Clumsy . . . behavior”), both contain instances of

- (A) simile
- (B) paradox
- (C) euphemism
- (D) qualification
- (E) understatement

8. The author of Passage 2 would most likely describe the claim about “fear, guilt, and distress” (line 6, Passage 1) as a

- (A) conventional but inaccurate perception
- (B) plausible theory that may prove to be correct
- (C) misconception of little significance
- (D) nonstandard view that is based on faulty science
- (E) widespread and well-substantiated belief

9. Lines 20-23 (“As . . . them”) suggest that Bella DePaulo would most likely maintain that Passage 1

- (A) overlooks the behavior patterns of those who tell the truth
- (B) presents the very misconceptions that people often have about liars
- (C) offers a perceptive psychological analysis of liars’ deceptive behaviors
- (D) takes an overly sympathetic view of deceptive behavior
- (E) overemphasizes the role of linguistic patterns in lying

Questions 10–15 are based on the following passage.

This passage, adapted from a 1983 biography, discusses Frida Kahlo (1907–1954), a Mexican painter. Known for her distinctive artistic style, her flamboyant dress, and her tumultuous life, Kahlo endured numerous health problems and emotional upheavals, many of which are depicted in her paintings.

It was not bohemian casualness that prompted Frida Kahlo to choose for her wedding dress the borrowed clothes of a Tehuana Indian woman. When she put on this costume, she was choosing a new identity, and she did it with all the fervor of a nun taking the veil. Even when she was a girl, clothes were a kind of language for Kahlo, and the intricate links between dress and self-image, and between personal style and painting style, formed one of the subplots in the unfolding drama of her life.

For Kahlo the elements of her dress were a kind of palette from which she selected each day the image of herself that she wished to present to the world. Wearing Tehuana costumes was part of Kahlo's self-creation as a legendary personality intimately connected to her native land. Yet while she was definitely playing a role, hers was an authentic artifice. She did not change her personality to fit the image she presented; rather, she invented a highly individualistic personal style to dramatize the personality that was already there.

Indeed, Kahlo's Tehuana costume became so essential a part of her persona that several times she painted it devoid of its owner. The costume served as a stand-in for herself, a second skin never totally assimilated to the person hidden under it but so integral to her that even when it was taken off, it retained something of the wearer's being. Clearly Kahlo knew of the magic power of clothes to substitute for their owner; in her diary, she wrote that the Tehuana costume made "the absent portrait of only one person"—her absent self.

Always a form of social communication, as the years passed Kahlo's costumes became an antidote to isolation; even when she was very ill and received few visitors, she dressed every day as if she were preparing for a fiesta. As her self-portraits confirmed her existence, so did the costumes make the frail, often bedridden woman feel more magnetic and visible, more emphatically present as a physical object in space. Paradoxically, they were both a mask and a frame. Since they defined the wearer's identity in terms of appearance, they distracted her—and the onlooker—from inner pain. The elaborate packaging was an attempt to compensate for her sense of fragmentation and dissolution. Ribbons, flowers, jewels, and sashes became more and more colorful and elaborate as her health declined late in life. In a sense, Kahlo was like a Mexican piñata: she was a fragile vessel decorated with frills and ruffles, and just as blindfolded children swing at the piñata

with a broomstick, life dealt Kahlo blow after blow. While the piñata dances and sways, the knowledge that it is about to be destroyed makes its bright beauty all the more poignant.

In the same way, Kahlo's decoration was touching: it was at once an affirmation of her love of life and a signal of her awareness—and defiance—of life's troubles.

10. The passage primarily serves to

- (A) refute a popular belief about modern painters
- (B) discuss the critical response to an important artist's work
- (C) evaluate the artistic techniques of a well-known painter
- (D) analyze a method of self-expression for a noted artist
- (E) provide a comprehensive biography of a famous painter

11. The first sentence of the passage primarily serves to

- (A) support a prevailing opinion
- (B) describe a provocative theory
- (C) dispel a potential misconception
- (D) delineate an ongoing problem
- (E) offer a tentative solution

12. The reference to a nun in line 5 primarily serves to suggest Kahlo's

- (A) pious humility
- (B) worldly renunciation
- (C) intellectual rigor
- (D) personal selflessness
- (E) enthusiastic devotion

13. In lines 15–16 ("Yet . . . artifice"), the author indicates that playing a role can

- (A) be a complex, almost incomprehensible masquerade
- (B) be a form of sincere self-expression
- (C) dramatize the individual's history
- (D) conceal embarrassing secrets
- (E) alter the personality of the role player

5



5

Unauthorized copying or reuse of
any part of this page is illegal.

5



5

14. The reference to “a mask and a frame” (lines 37-38) indicates that Kahlo’s costumes

(A) communicated Kahlo’s inner feelings to others
(B) mystified people studying Kahlo’s work
(C) could not be separated from Kahlo’s actual paintings
(D) incorporated everyday physical objects
(E) served seemingly contradictory functions

15. The passage indicates that “Ribbons, flowers, jewels, and sashes” (line 42) became more elaborate to

(A) contrast with Kahlo’s artistic austerity
(B) enhance the imagery in Kahlo’s self-portraits
(C) counterbalance Kahlo’s increasing frailty
(D) showcase Kahlo’s success as an artist
(E) express Kahlo’s enthusiasm for adornments



Questions 16-24 are based on the following passage.

This passage is adapted from the autobiographical account of a journalist traveling through Africa to research chimpanzees.

Our walk through the forest was like a journey through an extended underground cavern. We wound through obscure passages, out into small openings or great rooms, and then tunneled back into winding passageways. Toward Line 5 the end of the afternoon, we followed what seemed to be a large movement of chimpanzees into one great open room in the forest, relatively clear except for columns of nut trees. Soon about a dozen chimps were hammering away, using log hammers on log or root anvils.

10 We had entered a factory, but it was also a nursery. I turned to watch a mother playing with her infant, tickling his toes with playful little nibbles and then looking into his laughing face and eyes with the most amazing gaze of adoration. Elsewhere, three adult females had situated 15 themselves in a tree and were kissing and tickling an infant, who writhed with apparent pleasure. Suddenly, their faces, which had taken on remarkable glowing expressions of adoration, registered in my mind as entirely comprehensible. I was looking at intelligent faces 20 experiencing an emotion I could only imagine to be love.

One commentator has said that the big difference between humans and chimps (intelligent though those apes may be) is that humans can invent great wonders of technology. "I considered the differences between 25 men and animals," this person wrote. "Some were vast. A chimpanzee could be taught to drive a car. It could even be taught to build parts of it. But it could not begin to design it . . . Our intellect is incomparably more sophisticated than [that of] any animal." One hears this 30 sort of argument often, and, to my mind, it is mere self-stroking puffery. Could you or I begin to design a car? Has any single human actually designed a car? Could any one person abandoned at birth on a desert island somewhere—without pictures, communication, education, 35 or artifacts—even invent a tricycle or a child's kite or a mousetrap? Obviously not. Left at birth on a desert island, you and I and that commentator would be lifting and dropping chunks of wood or rounded stones onto hard nuts—and be glad we figured that one out.

40 The great accomplishment of *Homo sapiens* is not technology, which has become bigger and scarier than we are, a mixed blessing. The great accomplishment is language, which has enabled us to accumulate and coordinate our achievements, insights, and minicreations. 45 Our big technologies are collective efforts, cultural products, all and always made possible by language. Even the supposed "milestones" of technological advancement—the use of movable type, to take one example—were collective events. Johannes Gutenberg* 50 didn't think up movable type whole, in an isolated stroke of genius. His partner was a goldsmith; his father was a

mint employee, entirely familiar with soft metals. Printing presses were all around Europe by then. Gutenberg's great genius was to assemble, revise, and modify already

55 long-established traditions in metallurgy, goldsmithing, and woodblock printing, not to mention papermaking and press design.

Our one great accomplishment is language, but our great hope is the internal compass that may enable us to guide 60 ourselves and our technological powers into the future: our glowing capacity for valuing our own kind and for at least some empathy beyond our kind. The hand lifting and dropping the stone is less impressive than the eye that gazes with love.

*Gutenberg's typesetting process made the mass production of text possible.

16. It can be inferred that the "chimps" mentioned in line 8 are

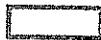
(A) using simple tools to crack open nuts
(B) expressing themselves by making a lot of noise
(C) taking out their aggressions on the nut trees
(D) working cooperatively on different tasks
(E) mimicking the work habits of human beings

17. The author uses the word "factory" (line 10) primarily to suggest that

(A) some chimpanzees live a highly regimented life
(B) the sound created by the chimpanzees' activity is loud enough to impair hearing
(C) the chimpanzees are doing productive work collectively
(D) only those chimpanzees who want to participate in communal activities do so
(E) the activity of the male chimpanzees differs significantly from that of the females

18. In lines 30-31 ("it . . . puffery"), the author characterizes the commentator's argument as

(A) useless flattery
(B) exaggerated self-regard
(C) witty repartee
(D) self-conscious hyperbole
(E) deliberate distortion



19. The questions in lines 31-36 serve primarily to
- suggest ideas for further research
 - provide an example of missing data
 - point to an alternative explanation
 - debate whether knowledge is incomplete
 - imply that an argument is flawed
20. In lines 40-42 ("The great . . . blessing"), the author characterizes technology as
- the accomplishment that distinguishes *Homo sapiens* from chimpanzees
 - a phenomenon that has come to overshadow those who developed it
 - an inevitable step in the development of human beings and their societies
 - an achievement that has grown impressively in importance over time
 - a force that is ultimately shaped by the fears of those who created it
21. According to the author, the "great accomplishment is language" (lines 42-43) because it allows human beings to
- combine small, individual advances into something larger and more powerful
 - express their emotions and show their feelings toward one another
 - work with each other so that dangerous conflicts can be avoided
 - express in concrete form notions that would otherwise seem vague and abstract
 - demonstrate that they are more intelligent, and thus more capable, than chimpanzees
22. The author uses the word "supposed" in line 47 primarily to
- signal a claim that is counterintuitive for most people
 - make reference to a viewpoint that is known to be controversial
 - suggest that a certain concept may not be entirely accurate
 - indicate a complete and technically correct definition
 - bolster the claims of authorities who are often cited
23. Which best describes the relationship between the "internal compass" (line 59) and the characterization of chimpanzee behaviors in the second paragraph (lines 10-20) ?
- One shows a sophisticated understanding, while the other shows a less-developed capacity for understanding.
 - One deals with nonverbal communication, while the other deals with communication through language.
 - One is an example of a uniquely human ability, while the other is an example of an ability that chimpanzees may or may not have.
 - Both represent the ability to have affection for and understanding of other beings.
 - Both are examples of the ability of primates to use tools to improve their lives.
24. The "hand" (line 62) and the "eye" (line 63) represent, respectively, which of the following?
- Gesture and feeling
 - War and peace
 - Ingenuity and language
 - Communication and meaning
 - Technology and empathy

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.

SECTION 6

Time — 25 minutes

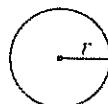
20 Questions

Turn to Section 6 (page 6) 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

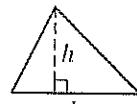


$$A = \pi r^2$$

$$C = 2\pi r$$



$$A = lw$$



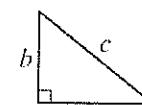
$$A = \frac{1}{2}bh$$



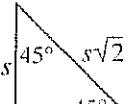
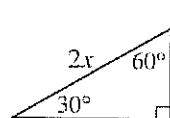
$$V = lwh$$



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



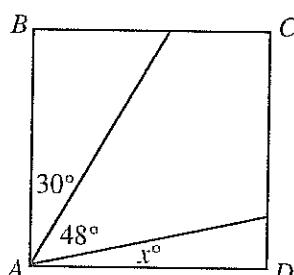
$$c^2 = a^2 + b^2$$



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. In the figure above, $ABCD$ is a square. What is the value of x ?

- (A) 2
(B) 6
(C) 8
(D) 10
(E) 12

All sophomores are now 16 years old.

2. Which of the following statements shows that the statement above is not true?
- (A) Tim is a senior who is 18 years old.
(B) Sheng is a junior who is 16 years old.
(C) Elida is a sophomore who is 16 years old.
(D) Dennis is a sophomore who is 15 years old.
(E) Luis is a freshman who is 15 years old.



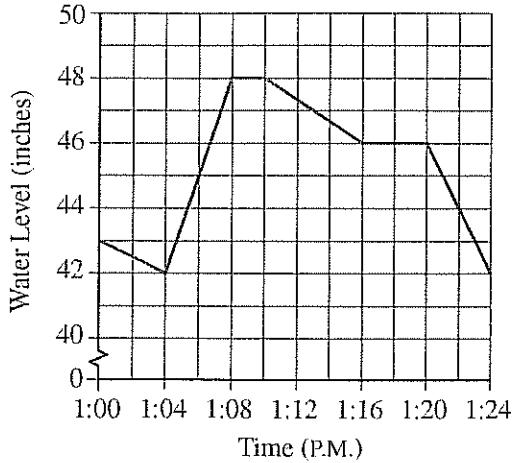
3. If $m + 3k = 8$, what is the value of $2m + 6k$?

(A) 13
(B) 16
(C) 22
(D) 24
(E) 32

5. The number b is 5 less than twice the number c . The product of b and c is 45. Which of the following pairs of equations could be used to find the values of b and c ?

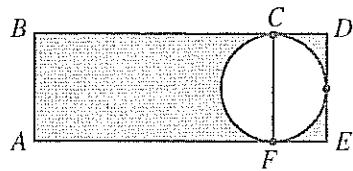
- (A) $b = 2 - 5c$
 $45 = bc$
- (B) $b = 2c - 5$
 $45 = bc$
- (C) $b = 2c - 5$
 $45c = b$
- (D) $b = 2c + 5$
 $45c = b$
- (E) $b = 2(c + 5)$
 $45 = bc$

WATER LEVEL IN A HOLDING TANK



4. The graph above shows how the level of water in a holding tank changed as water drained into and out of the tank. During which time period did the water level in the holding tank change most rapidly?

(A) Between 1:00 P.M. and 1:04 P.M.
(B) Between 1:04 P.M. and 1:08 P.M.
(C) Between 1:08 P.M. and 1:10 P.M.
(D) Between 1:10 P.M. and 1:16 P.M.
(E) Between 1:20 P.M. and 1:24 P.M.



Note: Figure not drawn to scale.

6. In the figure above, $ABDE$ is a rectangle, and \overline{CF} is a diameter of the circle. If the length of \overline{AB} is 4 centimeters and the length of \overline{BD} is 6 centimeters, what is the total area, in square centimeters, of the shaded regions?

- (A) $8 + \pi$
- (B) $8 + 4\pi$
- (C) $16 + \frac{\pi}{2}$
- (D) $24 - 4\pi$
- (E) $24 - 2\pi$

7. If $n > 0$, which of the following is equivalent to $\frac{n}{5}$?

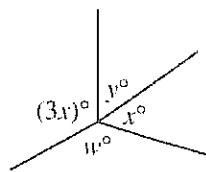
- (A) 5% of n
- (B) 20% of n
- (C) 25% of n
- (D) 50% of n
- (E) 500% of n

r	s	t
0	8	0
36	12	1
96	16	2
180	20	3

8. For every row of values in the table above, $\frac{r}{s} = kt$, where k is a constant. What is the value of k ?
- (A) $\frac{1}{6}$
 - (B) $\frac{1}{3}$
 - (C) $\frac{3}{2}$
 - (D) 2
 - (E) 3

$$S = \{1, 4, 9, 16, \dots\}$$

9. Set S above consists of the squares of the positive integers. How many numbers in S are greater than 50 but less than 200?
- (A) Five
 - (B) Six
 - (C) Seven
 - (D) Eight
 - (E) Nine



Note: Figure not drawn to scale.

10. In the figure above, w is twice y and y is twice x . What is the value of x ?

(A) 36
(B) 40
(C) 45
(D) 72
(E) 144

$$f(t) = 100(2^{2t})$$

11. The number of bacteria in a certain dish over a 5-hour period is modeled by the function f defined above, where t represents time, in hours. According to the model, how many bacteria were in the dish at time $t = 0$?

(A) 0
(B) 50
(C) 100
(D) 150
(E) 200

12. For nonnegative integers x , y , and z , let $\boxed{x} \boxed{y} \boxed{z}$ be defined by $\boxed{x} \boxed{y} \boxed{z} = x(y + z)$. Which of the following is true?

(A) $\boxed{4} \boxed{2} \boxed{2} = \boxed{2} \boxed{4} \boxed{2}$
(B) $\boxed{3} \boxed{2} \boxed{2} = \boxed{2} \boxed{3} \boxed{2}$
(C) $\boxed{2} \boxed{3} \boxed{2} = \boxed{2} \boxed{2} \boxed{3}$
(D) $\boxed{1} \boxed{5} \boxed{3} = \boxed{3} \boxed{5} \boxed{1}$
(E) $\boxed{0} \boxed{1} \boxed{1} = \boxed{1} \boxed{0} \boxed{1}$

13. The average (arithmetic mean) of the 3 different positive integers x , y , and z is 50. If $x < y < z$ and $y = 30$, what is the least possible value of z ?

(A) 50
(B) 51
(C) 59
(D) 90
(E) 91

GO ON TO THE NEXT PAGE

14. In preparing for a race, Jill ran $\frac{1}{2}$ the distance that Sam ran, and Sam ran 3 times the distance that Aisha ran. What was the ratio of the distance that Jill ran to the distance that Aisha ran?

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

15. The longest side of a right triangle has length $\sqrt{15}$. Which of the following pairs CANNOT be the lengths of the two shorter sides of the triangle?
- (A) $\sqrt{7}$ and $\sqrt{8}$
(B) $\sqrt{5}$ and $\sqrt{10}$
(C) $\sqrt{6}$ and $\sqrt{13}$
(D) 2 and $\sqrt{11}$
(E) 1 and $\sqrt{14}$

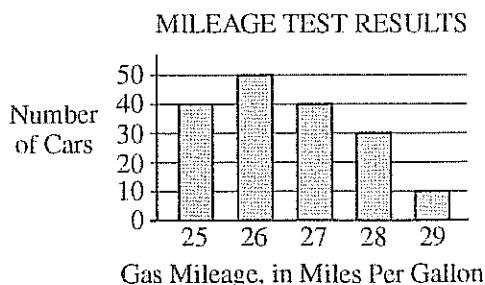
$$y = \frac{x+2}{x-5}$$

16. In the equation above, y is positive when $x = a + \frac{1}{2}$ and negative when $x = a - \frac{1}{2}$. Which of the following could be the value of a ?

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

17. The first term of a sequence is a . Each term after the first is p more than the preceding term. Which of the following expressions is the sum of the first 6 terms of the sequence?

(A) $6a + 5p$
(B) $6a + 15p$
(C) $6a + 18p$
(D) $12a + 5p$
(E) $12a + 30p$



18. The graph above shows the advertised number of miles per gallon of gasoline used by a group of cars that were tested by a consumers' group. What is the median advertised gas mileage for these cars, in miles per gallon?

(A) 26
 (B) 26.5
 (C) 26.75
 (D) 27
 (E) 27.5

19. If $|x| = |y|$ and $x \neq y$, which of the following must be true?

I. $x + y = 0$
 II. $xy < 0$
 III. $x^2 = y^2$

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

20. If $b > 1$, what is the slope of the line in the xy -plane that passes through the points (b, b^2) and (b^2, b^4) ?

(A) $-b^2 + 5b$
 (B) $-b^2 + b$
 (C) $-b^2 - b$
 (D) $b^2 - b$
 (E) $b^2 + b$

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.



SECTION 7

Time — 25 minutes

35 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.

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 B C D E

1. Economics is when you study the production, distribution, and consumption of goods and services.

- (A) when you study
- (B) what you study about
- (C) your studying of
- (D) doing a study on
- (E) the study of

2. Whenever Umberto sang in the shower, his voice rings throughout the house.

- (A) rings
- (B) is ringing
- (C) would ring
- (D) ringing
- (E) has rung

3. To prepare for Tet, the Vietnamese Lunar New Year celebration, families clean their homes, buy new clothing, and their debts are paid.

- (A) clean their homes, buy new clothing, and their debts are paid
- (B) clean their homes, they buy new clothing, and their debts are paid
- (C) clean their homes and buy new clothing, also, their debts are paid
- (D) clean their homes, buy new clothing, and they pay their debts
- (E) clean their homes, buy new clothing, and pay their debts

4. Fermentation is caused by yeast, which turns sugar and starch into alcohol and carbon dioxide.

- (A) which turns sugar and starch
- (B) it turns sugar and starch
- (C) by it turning sugar and starch
- (D) as sugar and starch turns
- (E) sugar and starch are turned

5. Many of the ships used by oceanographic institutions are small vessels that have outlived the purpose which they have been built for originally.
- (A) vessels that have outlived the purpose which they have been built for originally
(B) vessels that have outlived their original purpose
(C) vessels, and these had outlived their original purpose in being built
(D) vessels, having outlived their original purpose
(E) vessels, they have outlived the purpose for which they were originally built
6. A slender, razor-toothed hunter that can grow to more than three feet long, the populations of other fish, amphibians, and even waterfowl can be devastated by the northern pike.
- (A) the populations of other fish, amphibians, and even waterfowl can be devastated by the northern pike
(B) the populations of other fish, amphibians, and even waterfowl that were devastated by the northern pike
(C) other fish, amphibians, and even waterfowl populations are devastated by the northern pike
(D) the northern pike, devastating populations of other fish, amphibians, and even waterfowl
(E) the northern pike can devastate the populations of other fish, amphibians, and even waterfowl
7. Since civilization began, some cities have been built according to a deliberate plan, whereas others have developed naturally.
- (A) some cities have been built
(B) some cities being built
(C) cities that have been built
(D) there has been cities built
(E) they have built some cities
8. The investors wanted to know did the company make a profit in the last quarter of the previous year.
- (A) did the company make
(B) has the company made
(C) had the company made
(D) if the company has made
(E) whether the company had made
9. New data showing that Saturn's rings were probably orbiting the planet billions of years ago, overturning scientists' earlier belief that the rings are only about 100 million years old.
- (A) New data showing that Saturn's rings were probably orbiting the planet billions of years ago, overturning
(B) New data show that Saturn's rings were probably orbiting the planet billions of years ago, overturning
(C) New data that show that Saturn's rings probably orbited the planet billions of years ago, overturning
(D) New data that show that Saturn's rings probably orbited the planet billions of years ago, and overturn
(E) Having shown that Saturn's rings were probably orbiting the planet billions of years ago, new data that overturn
10. My father insists that before buying a used car, have it thoroughly inspected by a reputable mechanic.
- (A) buying a used car, have it
(B) buying a used car, it is
(C) buying a used car, I have it
(D) I buy a used car to have it
(E) I buy a used car having it
11. August Wilson's Pittsburgh Cycle consists of ten plays, nine of which are set in Pittsburgh's Hill District, an African American neighborhood, and each of which is set in a different decade of the twentieth century.
- (A) nine of which are set in Pittsburgh's Hill District, an African American neighborhood, and each of which is set
(B) nine of them are set in Pittsburgh's Hill District, an African American neighborhood, and each one of them are set
(C) nine of them being set in Pittsburgh's Hill District, an African American neighborhood, each of them is set
(D) nine of the plays set in Pittsburgh's Hill District, an African American neighborhood, and the settings of each one is
(E) nine set in Pittsburgh's Hill District, an African American neighborhood, and each have their setting

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. In addition to cutting hair, barbers in Europe during
A B

the Middle Ages had the special functions of
C

performing surgery and they pulled teeth. No error
D E

13. We had initially planned to remove all of the old
A B

furniture from the storage area, but we decided
C

against doing so because it would have took too
D
much time. No error
E

14. Until time zones were standardized in the
A

United States, each railway station will have
B

to keep several clocks, each showing the time
C

of day according to a different railroad company.
D

No error
E

15. For the tourist which must travel on a restricted
A B

budget, the publisher of the guidebook has included
C

a list of inexpensive hotels. No error
D E

16. After the grueling rehearsal, the pianist felt wore out
A B

and wanted only to sleep. No error
C D E

17. Grapes, mangoes, and oranges are widely considered
A

delicious fruits, but it is in fact the banana that is
B C

shown by many surveys to be the more popular fruit
D

in the world. No error
E



18. A study by two marketing professors have found that
A

the best way for a newspaper to increase profits is
B C
 to spend more of its budget on improving news
D
 coverage. No error
E

19. The governor favored the new laws because it would
A B

allow the state to save more than ten million dollars.
C D

No error
E

20. One way in which orchestra bells differ with the
A

xylophone is that the bells produce more resonant
B C
 tones than the xylophone does. No error
D E

21. Endangered for decades by hunting and the use of
A B

pesticides, the bald eagle, with its snowy-feathered
C
 head and white tail, are now making a comeback.
D

No error
E

22. Poets during the Romantic period felt more freely
A

to express emotions in their writing than did poets
B C D
 of the Victorian period. No error
E

23. The success of the governor in attracting
A B

new industry to the rural area can be attributed
C

to their low cost of living. No error
D E

24. Many of the senator's speeches, which were
A

enthusiastically received by the large crowds
B
 that came to see him, addressed an important topic,
C
 including health care and global warming. No error
E

25. This biography, with its myriad quotations from
A

unnamed sources, is as blatant an example of
B C

character assassination of any I have ever seen.
D

No error
E

26. It is believed that small fish cluster together
A
when confronted by a predator in order to confuse
B
them and thereby protect themselves from harm.
C D
No error
E

27. Recently adopted as an emblem of humanitarian
A B
aid, the Red Crystal is, unlike its counterparts the
C
Red Cross and the Red Crescent, entirely devoid of
D
religious connotation. No error
E

28. Prior to the election of Henry Cisneros as mayor of
A B
San Antonio in 1981, no major city in the United States
had had a mayor from Mexican descent. No error
C D E

29. French mountain honey made from linden blossoms,
A
which are sometimes called "lime blossoms," have
B C
a distinctively citrus flavor. No error
D 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) When people describe me as "determined" or "tenacious," I know they really mean that I am a truly stubborn person. (2) I first recognize that I am a very stubborn person when I was in grade school and wanted to be able to juggle like my big brother. (3) He taught himself to juggle and by the age of six could juggle three balls perfectly. (4) My brother went in for juggling, as though he had been born with exceptional eye-hand coordination.

(5) I, on the other hand, seemingly had no natural juggling ability. (6) But I wouldn't give up. (7) I practiced endlessly, and slowly I began to get better. (8) Juggling just didn't come easily to me the way it had to my brother. (9) Eventually my stubbornness paid off.

(10) Throughout my life, though, I have been criticized for this very quality. (11) I am aware that what I see as determination, they sometimes see as a lack of realism. (12) My high school friends, for instance, thought I was overly optimistic because I was determined that I would someday play guitar in a rock band. (13) They recognized, as I did, that I was a mediocre guitarist. (14) I almost came to believe that my goal was unrealistic, but I wouldn't give up. (15) In the end, my improvement was modest, and I never did join a band, but I don't regret my efforts. (16) Nevertheless, I can play a few songs, which is more than my brother can do.

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

I first recognize that I am a very stubborn person when I was in grade school and wanted to be able to juggle like my big brother.

- (A) (As it is now)
- (B) In fact, I first recognize that I am a very stubborn person
- (C) I first recognized that he was a very stubborn person
- (D) I first recognized this trait in myself
- (E) The first time I recognize it is

31. In context, which of the following would best replace "went in for" in sentence 4 ?

- (A) had a talent for
- (B) has what it takes for
- (C) had been good at
- (D) would be good at
- (E) will have a knack for

32. In context, which would be best to do with sentence 8 (reproduced below) ?

Juggling just didn't come easily to me the way it had to my brother.

- (A) Leave it as it is.
- (B) Make it the first sentence of the passage.
- (C) Insert it immediately after sentence 5.
- (D) Delete "easily".
- (E) Change "my brother" to "him".

33. In context, which revision would most improve sentence 11 (reproduced below) ?

I am aware that what I see as determination, they sometimes see as a lack of realism.

- (A) Change "I am aware" to "I notice".
- (B) Change "what I see" to "the quality that I know".
- (C) Change "they" to "other people".
- (D) Delete "sometimes".
- (E) Add "in me" after "realism".

34. In context, which of the following is the best revision of the underlined portion of sentence 16 (reproduced below) ?

Nevertheless, I can play a few songs, which is more than my brother can do.

- (A) Even still, I can
- (B) At least I can
- (C) He can, nevertheless,
- (D) They can at least
- (E) However, I can

35. In context, which would be the best place to insert the following sentence?

I took guitar lessons and practiced day and night.

- (A) After sentence 4
- (B) After sentence 7
- (C) After sentence 10
- (D) After sentence 14
- (E) After sentence 15

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.



SECTION 8

Time — 20 minutes

19 Questions

Turn to Section 8 (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

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

1. In dire need of -----, the travelers fortified themselves with food and drink in order to complete their journey.
 (A) testimony (B) sponsorship (C) persecution
 (D) nourishment (E) sentiment
 2. John wished to become an ----- because he was interested in learning about ancient cultures.
 (A) astronomer (B) archaeologist (C) apologist
 (D) illusionist (E) impostor
 3. Although children's books about animals and plants are often ----- rather than accurate in their descriptions, a skillful elementary-school teacher can still ----- such texts for meaningful scientific learning.
 (A) factual . . challenge
 (B) fanciful . . exploit
 (C) lifelike . . employ
 (D) creative . . confuse
 (E) realistic . . ignore
4. Because she was a successful entrepreneur who donated large amounts of money to charitable causes, Madame C. J. Walker is remembered today as both a ----- and a -----.
- (A) sojourner . . benefactor
 - (B) protégé . . humanitarian
 - (C) magnate . . prevaricator
 - (D) raconteur . . dilettante
 - (E) tycoon . . philanthropist
5. The ----- of the scientist's rebuttal of the hypothesis was startling even in the notoriously ----- world of nineteenth-century geology.
- (A) ferocity . . contentious
 - (B) arrogance . . conventional
 - (C) indifference . . malignant
 - (D) originality . . narrow-minded
 - (E) accuracy . . inexact
6. Like cartoonists, some painters seek to communicate character -----, but this economy of means is not artistic shallowness.
- (A) precociously (B) ludicrously (C) sinuously
 - (D) mercilessly (E) succinctly



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

Questions 7-19 are based on the following passage.

The following passage is from a nineteenth-century British novel. The narrator is Gabriel Betteredge, the butler of Lady Julia Verinder, owner of a stolen diamond called the Moonstone.

In the first part of *Robinson Crusoe*,* at page one hundred and twenty-nine, you will find it thus written:

Line 5 "Now I saw, though too late, the Folly of beginning a Work before we count the Cost, and before we judge rightly of our own Strength to go through with it."

10 Only yesterday I opened my *Robinson Crusoe* at that place. Only this morning (May 21, 1850) came my lady's nephew, Mr. Franklin Blake, and held a short conversation with me, as follows:

15 "Betteredge," says Mr. Franklin, "I have been to the lawyer's about some family matters; and, among other things, we have been talking of the loss of the Indian Diamond, in my aunt's house in Yorkshire, two years since. The lawyer thinks, as I think, that the whole story ought, in the interests of truth, to be placed on record in writing—and the sooner the better."

20 Not perceiving his drift yet, and thinking it always desirable for the sake of peace and quietness to be on the lawyer's side, I said I thought so too. Mr. Franklin went on:

25 "In this matter of the Diamond," he said, "the characters of innocent people have suffered under suspicion already—as you know. The memories of innocent people may suffer, hereafter, for want of a record of the facts to which those who come after us can appeal. There can be no doubt that this strange family story of ours ought to be told. And I think, Betteredge, the lawyer and I together have hit on the right way of telling it."

30 Very satisfactory to both of them, no doubt. But I failed to see what I myself had to do with it, so far.

35 "We have certain events to relate," Mr. Franklin proceeded; "and we have certain persons concerned in those events who are capable of relating them. Starting from these plain facts, the lawyer's idea is that we should all write the story of the Moonstone in turn—as far as our own personal experience extends, and no further. We must begin by showing how the Diamond first fell into the hands of my uncle Herncastle, when he was serving in India fifty years since. This prefatory narrative I have already got by me in the form of an old family paper, which relates the necessary particulars on the authority of an eye-witness. The next thing to do is to tell how the

45 Diamond found its way into my aunt's house in Yorkshire, two years since, and how it came to be lost in little more than twelve hours afterward. Nobody knows as much as you do, Betteredge, about what went on in the house at that time. So you must take the pen in hand, and start the story."

50 In those terms I was informed of what my personal concern was with the matter of the Diamond. If you are curious to know what course I took under the circumstances, I beg to inform you that I did what you would probably have done in my place. I modestly

55 declared myself to be quite unequal to the task imposed upon me—and I privately felt, all the time, that I was quite clever enough to perform it, if I only gave my own abilities a fair chance. Mr. Franklin, I imagine, must have seen my private sentiments in my face. He declined to

60 believe in my modesty; and he insisted on giving my abilities a fair chance.

Two hours have passed since Mr. Franklin left me. As soon as his back was turned I went to my writing-desk to start the story. There I have sat helpless (in spite of my abilities) ever since; seeing what Robinson Crusoe saw, as quoted above—namely, the folly of beginning a work before we count the cost, and before we judge rightly of our own strength to go through with it. Please to remember, I opened the book by accident, at that bit, only the day 70 before I rashly undertook the business now in hand; and, allow me to ask—if that isn't prophecy, what is?

* A British novel by Daniel Defoe, published in 1719

7. The quotation in lines 4-6 ("Now . . . it") implies that one should

- (A) assess a project carefully before committing oneself to it
- (B) strive to meet a challenge rather than to avoid it
- (C) take advantage of an opportunity before it is lost
- (D) approach a task with a sense of amusement instead of annoyance
- (E) focus on the benefits that can be earned by accomplishing a difficult feat



8. The repetition of “Only” in lines 7-8 serves to emphasize the
- uniqueness of an experience
 - solitary nature of a task
 - simplicity of a solution
 - brevity of an interval
 - insignificance of an action
9. In lines 11-49 (“Betteredge . . . story”), Mr. Franklin proposes that
- various people contribute individual accounts to a single narrative about the diamond
 - everyone with an interest in the diamond gather together to write its story
 - the lawyer interview different people and compile their views in a report about the diamond
 - the narrator research and write the definitive story of the diamond
 - the narrator determine the reliability of existing documents related to the diamond
10. As revealed in lines 18-20 (“Not . . . too”), Betteredge’s attitude toward the lawyer is
- belligerent
 - envious
 - deferential
 - protective
 - empathetic
11. In line 23, Mr. Franklin voices the concern that “innocent people”
- have been corrupted
 - have been defamed
 - have been forgotten
 - possess faulty memories
 - suffer feelings of guilt
12. In line 25, “want” most nearly means
- poverty
 - desire
 - lack
 - fault
 - requirement
13. Lines 30-31 (“Very . . . far”) suggest that Betteredge felt a sense of
- momentary perplexity
 - adamant disapproval
 - sincere regret
 - increasing alarm
 - profound disappointment
14. The phrase “no further” (line 37) emphasizes the lawyer’s view that the story of the Moonstone should NOT
- be completed if it implicates a family member
 - be made known outside the household
 - be based on speculation or hearsay
 - continue to be recounted once it is written down
 - proceed past the time of the stone’s disappearance
15. Lines 58-59 (“Mr. Franklin . . . face”) suggest that Mr. Franklin
- lacked confidence in Betteredge’s abilities
 - was able to determine Betteredge’s true feelings
 - enjoys a close relationship with Betteredge
 - tends to disregard other people’s viewpoints
 - is a difficult man to understand
16. The phrase “As soon as his back was turned” (line 63) serves to emphasize Betteredge’s
- deviousness
 - cowardice
 - disloyalty
 - eagerness
 - courtesy
17. The quotation from *Robinson Crusoe* is repeated in lines 66-68 (“namely . . . with it”) in order to
- defend Betteredge’s ability to complete a task
 - praise a little-known insight into human nature
 - emphasize a warning Betteredge should have heeded
 - question the relevance of the novel to modern readers
 - show how Betteredge arrived at a faulty conclusion



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18. In line 67, "cost" most nearly means

(A) personal toll
(B) legal obligation
(C) moral fortitude
(D) financial expenditure
(E) social sacrifice

19. Ultimately, Betteredge regards the quotation from *Robinson Crusoe* as

(A) an omen
(B) a cliché
(C) a metaphor
(D) a paradox
(E) a distraction

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.



SECTION 9
Time — 20 minutes
16 Questions

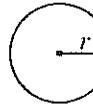
Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.

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

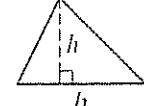


$$A = \pi r^2$$

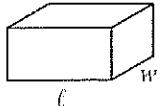
$$C = 2\pi r$$



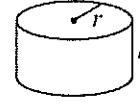
$$A = lw$$



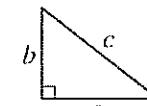
$$A = \frac{1}{2}bh$$



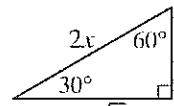
$$V = lwh$$



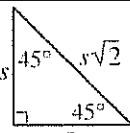
$$V = \pi r^2 h$$



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



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.

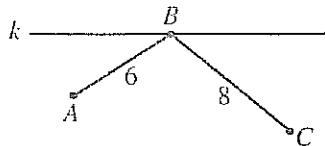
$$16 \blacktriangle k = 8$$

1. In the equation above, \blacktriangle represents one of the operations of arithmetic: addition, subtraction, multiplication, or division. If k is a positive integer not equal to 8, what must be the value of k ?
- (A) 2
 (B) 4
 (C) 16
 (D) 24
 (E) 128

2. During a special promotion, each customer who makes a purchase is given a coupon for a discount of either 10, 20, 30, 40, or 50 percent. If a customer has an equal chance of receiving any one of the 5 types of discount coupons, what is the probability that the first customer will receive a discount coupon for less than 25 percent?

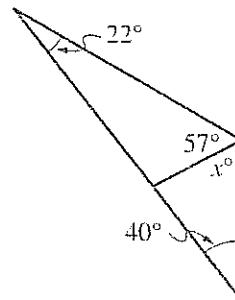
- (A) $\frac{1}{5}$
 (B) $\frac{2}{5}$
 (C) $\frac{3}{5}$
 (D) $\frac{2}{3}$
 (E) $\frac{3}{4}$

GO ON TO THE NEXT PAGE



3. In the figure above, point B is on line k and point D (not shown) is the reflection of point C across line k . What is the length of \overline{BD} ?

(A) 6
 (B) 7
 (C) 8
 (D) 10
 (E) It cannot be determined from the information given.



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

(A) 50
 (B) 61
 (C) 97
 (D) 101
 (E) 114

4. Mr. Martinez has 750 boxes of cookies in his store, and each week he plans to sell 150 boxes of cookies. Assuming he does not receive a new shipment of cookies, how many boxes of cookies does he expect to have in his store at the end of w weeks, where w is an integer and $1 \leq w \leq 5$?

(A) $750(150w)$
 (B) $750w - 150$
 (C) $750w - 150w$
 (D) $750 - 150w$
 (E) $750 + 150w$

9



9

6. In the xy -plane, the graph of the equation $y = 3x + 5$ is a line that intersects the y -axis at $(0, b)$. What is the value of b ?

(A) -5
(B) -3
(C) 0
(D) 3
(E) 5

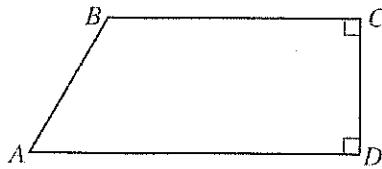
$$\begin{aligned}2x + 2y + 2z &= 36 \\2 + y + z &= 18\end{aligned}$$

8. Based on the system of equations above, what is the value of x ?

(A) 2
(B) 4
(C) 6
(D) 9
(E) 16

7. The radius of a circle is 10 inches less than its diameter. What is the circumference of the circle, in inches?

(A) 5π
(B) 10π
(C) 15π
(D) 20π
(E) 25π



9. In the figure above, $BC = 13$, $AD = 17$, and $CD = 7$. What is the area of quadrilateral $ABCD$?

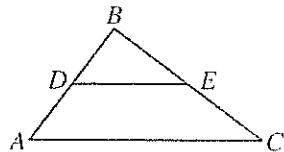
(A) 77
(B) 91
(C) 105
(D) 119
(E) 147

10. R , S , and J are positive single-digit integers. Which of the following is equal to $(R \times 10^5) + (S \times 10^4) + (J \times 10^1)$?

(A) $R,S00,0J0$
(B) $R,S00,00J$
(C) $RS0,J00$
(D) $RS0,0J0$
(E) $RS,J00$

11. Norman used $\frac{1}{4}$ of his monthly allowance to purchase a book and saved $\frac{1}{3}$ of the remaining allowance for a school trip to the museum. What fraction of Norman's monthly allowance was saved for the school trip?

(A) $\frac{1}{4}$
(B) $\frac{1}{2}$
(C) $\frac{7}{12}$
(D) $\frac{2}{3}$
(E) $\frac{3}{4}$



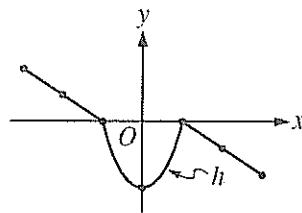
Note: Figure not drawn to scale.

12. In $\triangle ABC$ above, $BD = 3$, $DA = 6$, $BC = 12$, and \overline{DE} is parallel to \overline{AC} . What is the length of \overline{EC} ?

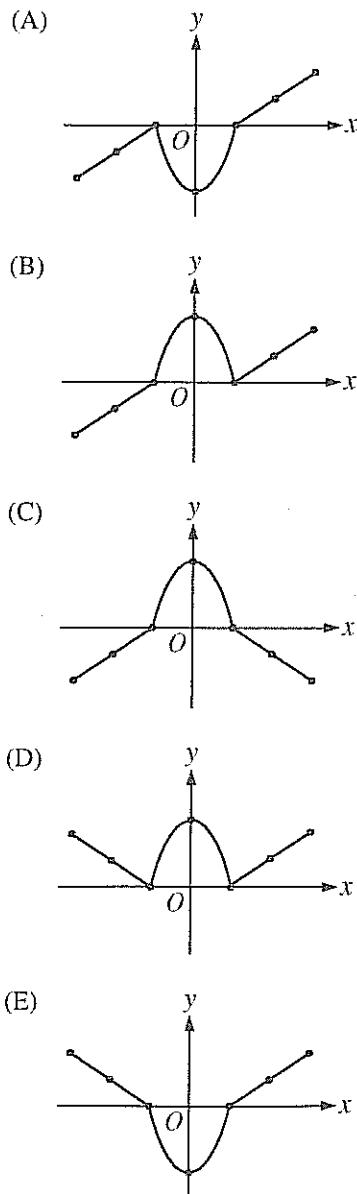
(A) 6
(B) 7
(C) 8
(D) 9
(E) 10

13. If $x > 0$, n is a nonnegative integer, and $2x^{n+1} + x^{n+2} = x^{n+3}$, which of the following must equal x^3 ?

(A) $2 + 2x + x^2$
(B) $2x + x^2$
(C) $2 + x^2$
(D) $2 + x$
(E) $3x$

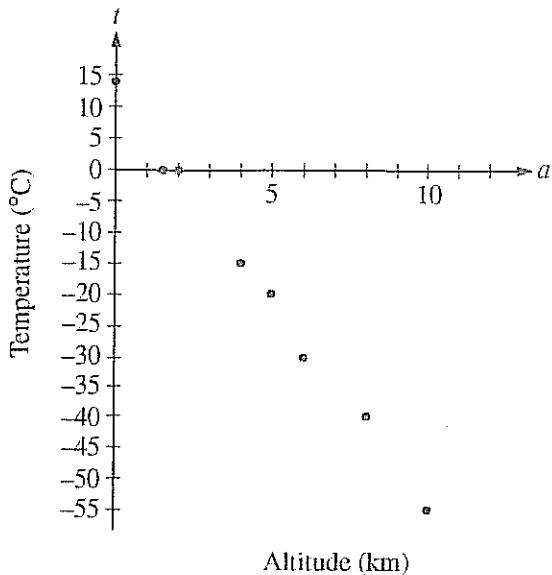


14. The graph of the function h is shown above. Which of the following could be the graph of $y = |h(x)|$?





ALTITUDE AND TEMPERATURE



15. The scatterplot above gives the altitude and temperature of 8 locations at a given time. If a is the altitude, in kilometers, and t is the temperature, in degrees Celsius, which of the following linear equations best models temperature as a function of altitude for this data?
- (A) $t = -a + 1$
 (B) $t = -2a + 7$
 (C) $t = -2a + 13$
 (D) $t = -7a + 7$
 (E) $t = -7a + 13$

The sum of r and 5 is less than the square of the difference between r and 5 but greater than the square of one-half r .

16. Which of the following is equivalent to the statement above?
- (A) $\frac{1}{4}r^2 < r + 5 < (r - 5)^2$
 (B) $\frac{1}{4}r^2 < r + 5 < r^2 - 5$
 (C) $\frac{1}{2}r^2 < r + 5 < (r - 5)^2$
 (D) $\frac{1}{2}r^2 < r + 5 < r^2 - 5$
 (E) $\frac{1}{2}r^2 < r^2 - 5 < r^2 + 5$

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.



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

1. Billie Holiday is considered by many the greatest jazz vocalist of all time, even being that her career was relatively short and often erratic.

- (A) even being that
- (B) even although
- (C) even though
- (D) although that
- (E) although seeing how

2. After the Soviet Union blockaded all access to West Berlin in June 1948, three nations sent airplanes to the city, which were loaded with much-needed food and supplies.
- (A) airplanes to the city, which were loaded with much-needed food and supplies
 - (B) airplanes loaded with much-needed food and supplies to the city
 - (C) airplanes, they were loaded for the city with much-needed food and supplies
 - (D) to the city food and supplies that were much needed and it was loaded in airplanes
 - (E) food and supplies, this was much needed and loaded in airplanes to the city
3. The reason many people are careless in driving is because of their too easily being distracted by what is happening around them.
- (A) are careless in driving is because of their too easily being
 - (B) as drivers being careless is that it is too easy for them to be
 - (C) are careless while driving is the ease of one's being
 - (D) lack care while driving is their too easily being
 - (E) drive carelessly is that they are too easily
4. No one was more pleased than I when we heard that María was offered the job that she had worked so hard to obtain.
- (A) No one was more pleased than I
 - (B) No one took more pleasure than me
 - (C) Nobody who was more pleased than I was
 - (D) No one, compared to me, being more pleased
 - (E) None being more pleased than I



5. In some places the sea is unusually rich in nutrients, tiny plants multiply there, turning the water green.
- (A) In some places the sea is unusually rich in nutrients, tiny plants multiply there
(B) Where the sea is unusually rich in nutrients, tiny plants multiply
(C) The unusual nutritional richness of the sea in some places multiplying tiny plants
(D) Unusually rich in nutrients in some places, where tiny plants multiply in parts of the sea
(E) Tiny plants multiplying in the unusual nutritional richness of the sea
6. Spanning the middle of Turkey, travelers have for centuries been captivated by the inland region known as Cappadocia, with its fantastic moonlike landscape.
- (A) travelers have for centuries been captivated by the inland region known as Cappadocia, with its fantastic moonlike landscape
(B) travelers have been captivated for centuries by the inland region known as Cappadocia and by its fantastic moonlike landscape
(C) the inland region known as Cappadocia has captivated travelers for centuries with its fantastic moonlike landscape
(D) the fantastic moonlike landscape of the inland region known as Cappadocia, which has captivated travelers for centuries
(E) having captivated travelers for centuries, the inland region known as Cappadocia, with its fantastic moonlike landscape
7. Neither candidate was inclined to avoid a verbal scuffle or to forgo a little publicity.
- (A) or to forgo
(B) or forgoing
(C) or having forgone
(D) and never forgoing
(E) and they did not forgo
8. Evidence from several research studies have suggested that while all exercise has a positive effect on people's moods, exercise performed out of doors brings the greatest psychological benefits.
- (A) have suggested that while
(B) suggests that while
(C) suggesting that while
(D) suggest that
(E) that suggest
9. People contribute to the disintegration and decomposition of rocks by excavating roads and tunnels, by mining, and by cultivating the land.
- (A) by cultivating
(B) in cultivating
(C) cultivating
(D) in their cultivation of
(E) by the cultivation of



10. In some species of birds, such as the peafowl, the plumage of the male is more colorful and more variegated than the female.
- than the female
 - than are the females
 - than that of the female
 - compared to the female
 - compared with the females
11. All of these cats have a kink in their tail.
- All of these cats have a kink in their tail.
 - All of these cats have a kink in its tail.
 - Each of these cats has a kink in its tail.
 - Each of these cats has a kink in their tails.
 - Each of these cats have kinks in their tails.
12. Despite writing more than 1,700 poems, only seven were published during Emily Dickinson's lifetime.
- only seven were published during Emily Dickinson's
 - they only published seven during Emily Dickinson's
 - seven of them were the only ones published during Emily Dickinson's
 - Emily Dickinson published only seven during her
 - of them only seven had Emily Dickinson published during her
13. Rachel Carson's groundbreaking book *Silent Spring* describes how poisons such as DDT accumulate in plants and animals, enter rivers and lakes, and threatening the balance of nature.
- enter rivers and lakes, and threatening the balance of nature
 - they enter rivers and lakes, and threaten the balance of nature
 - they are entering rivers and lakes, and threaten the balance of nature
 - how they enter rivers and lakes, and how they threaten the balance of nature
 - enter rivers and lakes, and how the balance of nature is threatened
14. Giraffes have a distinct way of walking, they move both right legs forward and then both left legs.
- walking, they move both right legs
 - walking, which move both right legs
 - walking, both its right legs move
 - walking: they move both right legs
 - walking; moving both right legs

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 Codes AEGC, BWGC, CFGC

Critical Reading

Section 2

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

Section 5

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

Section 8

COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.
1. D 1	11. B 4
2. B 1	12. C 5
3. B 3	13. A 3
4. E 4	14. C 3
5. A 4	15. B 2
6. E 5	16. D 3
7. A 3	17. C 3
8. D 4	18. A 3
9. A 4	19. A 3
10. C 4	

Number correct

Number correct

Number correct

Number incorrect

Number incorrect

Number incorrect

Writing Samples

Section 4

Multiple-Choice		Student-Produced Response Questions	
COR. DIFF. ANS. LEV.	COR. ANS.	DIFF. LEV.	
1. E 1	9. 7.80	2	
2. A 1	10. 6, 9, 12 or 15	3	
3. D 2	11. 72	2	
4. A 2	12. 102	3	
5. C 2	13. 36	3	
6. C 4	14. 4	4	
7. B 4	15. 5	3	
8. E 4	16. 3/4 or .75	4	
	17. 1000	4	
	18. 8521	5	

Section 6

COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.
1. E 1	11. C 3
2. D 1	12. C 3
3. B 2	13. E 3
4. B 1	14. D 3
5. B 1	15. C 3
6. D 2	16. E 4
7. B 3	17. B 5
8. E 2	18. A 5
9. C 3	19. E 4
10. A 3	20. E 4

Section 9

COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.
1. A 1	9. C 3
2. B 1	10. D 3
3. C 2	11. A 3
4. D 1	12. C 3
5. B 2	13. B 3
6. E 2	14. D 4
7. D 2	15. E 4
8. A 3	16. A 5

Number correct

Number correct
(9-18)

Number correct

Number correct

Number incorrect

Number incorrect

Number incorrect

Writing Multiple-Choice

Section 7

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

Section 10

COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.
1. C 1	6. C 3	11. C 4
2. B 2	7. A 3	12. D 3
3. E 2	8. B 3	13. D 4
4. A 2	9. A 3	14. D 5
5. B 2	10. C 3	

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).

Scoring Worksheet for Form Codes AEGC, BWGC, CFGC

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 2: Questions 1-24 _____

Section 5: Questions 1-24 + _____

Section 8: Questions 1-19 + _____

Total = _____ (A)

How many critical reading questions did you get wrong?

Section 2: Questions 1-24 _____

Section 5: Questions 1-24 + _____

Section 8: Questions 1-19 + _____

Total = _____

× 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 4: Questions 1-18 _____

Section 6: Questions 1-20 + _____

Section 9: Questions 1-16 + _____

Total = _____ (A)

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

Section 4: Questions 1-8 _____

Section 6: Questions 1-20 + _____

Section 9: Questions 1-16 + _____

Total = _____

× 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 7: Questions 1-35 _____

Section 10: Questions 1-14 + _____

Total = _____ (A)

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

Section 7: Questions 1-35 _____

Section 10: Questions 1-14 + _____

Total = _____

× 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 scale score.

Copy your essay score from your QAS report.
_____ (D)

Use the appropriate writing composite table (pages 54-56) 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 Codes AEGC, BWGC, CFGC

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	550	54
66	800			30	490	540	54
65	790			29	480	540	53
64	770			28	480	530	52
63	750			27	470	520	51
62	740			26	470	510	50
61	720			25	460	500	49
60	710			24	450	500	49
59	700			23	450	490	48
58	690			22	440	480	47
57	680			21	440	470	46
56	670			20	430	460	45
55	660			19	430	450	44
54	650	800		18	420	450	44
53	640	780		17	410	440	43
52	630	760		16	410	430	42
51	620	730		15	400	420	41
50	620	710		14	390	410	40
49	610	700	80	13	390	400	39
48	600	690	76	12	380	390	38
47	590	680	73	11	370	380	37
46	590	670	71	10	360	370	37
45	580	660	70	9	350	360	36
44	570	650	68	8	350	350	35
43	570	640	67	7	340	340	34
42	560	640	65	6	330	330	33
41	550	630	64	5	320	310	32
40	550	620	63	4	300	300	30
39	540	610	62	3	290	280	29
38	540	610	61	2	280	270	28
37	530	600	60	1	260	250	26
36	520	590	59	0	240	240	25
35	520	580	58	-1	220	220	23
34	510	570	57	-2	200	200	21
33	510	570	56	-3	200	200	20
32	500	560	55	and below			

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

SAT Writing Composite Score Conversion Table
Form Code AEGC

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

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

SAT Writing Composite Score Conversion Table
Form Code BWGC

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

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

SAT Writing Composite Score Conversion Table
Form Code CFGC

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

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