

YOUR NAME (PRINT) \_\_\_\_\_ LAST FIRST MI

TEST CENTER \_\_\_\_\_ NUMBER NAME OF TEST CENTER ROOM NUMBER

# SAT Reasoning Test — General Directions

## Timing

- You will have 3 hours and 45 minutes to work on this test.
- There are ten separately timed sections:
  - ▶ One 25-minute essay
  - ▶ Six other 25-minute sections
  - ▶ Two 20-minute sections
  - ▶ One 10-minute section
- You may work on only one section at a time.
- The supervisor will tell you when to begin and end each section.
- If you finish a section before time is called, check your work on that section. You may NOT turn to any other section.
- Work as rapidly as you can without losing accuracy. Don't waste time on questions that seem too difficult for you.

## Marking Answers

- Carefully mark only one answer for each question.
- Make sure each mark is dark and completely fills the circle.
- Do not make any stray marks on your answer sheet.
- If you erase, do so completely. Incomplete erasures may be scored as intended answers.
- Use only the answer spaces that correspond to the question numbers.
- You may use the test book for scratchwork, but you will not receive credit for anything written there.
- After time has been called, you may not transfer answers to your answer sheet or fill in circles.
- You may not fold or remove pages or portions of a page from this book, or take the book or answer sheet from the testing room.

## Scoring

- For each correct answer, you receive one point.
- For questions you omit, you receive no points.
- For a wrong answer to a multiple-choice question, you lose one-fourth of a point.
  - ▶ If you can eliminate one or more of the answer choices as wrong, you increase your chances of choosing the correct answer and earning one point.
  - ▶ If you can't eliminate any choice, move on. You can return to the question later if there is time.
- For a wrong answer to a student-produced response ("grid-in") math question, you don't lose any points.
- The essay is scored on a 1 to 6 scale by two different readers. The total essay score is the sum of the two readers' scores.
- Off-topic essays, blank essays, and essays written in ink will receive a score of zero.

The passages for this test have been adapted from published material. The ideas contained in them do not necessarily represent the opinions of the College Board or ETS.

**IMPORTANT:** The codes below are unique to your test book. Copy them on your answer sheet in boxes 8 and 9 and fill in the corresponding circles exactly as shown.

<b>9</b>	<b>TEST FORM</b> (Copy from back of test book)

<b>8</b>				<b>FORM CODE</b>		
(Copy and grid as on back of test book.)						
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**DO NOT OPEN THIS BOOK UNTIL THE SUPERVISOR TELLS YOU TO DO SO.**







Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

**SECTION**

**2**

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**SECTION**

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**CAUTION**

Use the answer spaces in the grids below for SECTION 2 or SECTION 3 only if you are told to do so in your test book.

**Student-Produced Responses**

ONLY ANSWERS ENTERED IN THE CIRCLES IN EACH GRID WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES ABOVE THE CIRCLES.

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Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION

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**You may use this space to make notes for your essay. Remember, however, that you will receive credit ONLY for what is written on your answer sheet.**

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NOTES ONLY

Write essay on answer  
sheet!

**ESSAY**

Time — 25 minutes

**Turn to page 2 of your answer sheet to write your ESSAY.**

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.**

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.

We often hear that we can learn much about someone or something just by casual observation. We are not required to look beneath the surface or to question how something seems. In fact, we are urged to trust our impressions, often our first impressions, of how a person or a situation seems to be. Yet appearances can be misleading. What “seems” isn’t always what is.

**Assignment:** Is the way something seems to be not always the same as it actually is? 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) ●

- Despite ----- on taking rare tamarins from their habitat, the illegal trade in the tiny monkeys remains -----.  
(A) commendations . . obligatory  
(B) consultations . . predominant  
(C) restrictions . . local  
(D) penalties . . illicit  
(E) prohibitions . . active
- Representing a round world on a flat surface is impossible without some -----: the Mercator projection map shows Greenland as over ten times larger than Mexico, a country in fact only slightly smaller than Greenland.  
(A) oversight (B) simplification  
(C) distortion (D) sophistication  
(E) superficiality
- The highly publicized redesign of the car is essentially -----: the exterior has been updated, but the engine remains unchanged.  
(A) intuitive (B) cosmetic (C) incoherent  
(D) consequential (E) retroactive
- Many of our memories are -----, escaping our consciousness just as we strain to recall a face or a name.  
(A) elusive (B) pervasive (C) unvaried  
(D) insensitive (E) impractical
- Although Caroline Gordon was rigorously objective in her journalistic writing, her lively and ----- private correspondence ----- a delightful capacity for biting commentary on the social scene.  
(A) incisive . . disguised  
(B) eloquent . . derided  
(C) dispassionate . . demonstrated  
(D) exuberant . . minimized  
(E) entertaining . . exhibited
- An effective member of a debating team must focus clearly on the ----- issue and avoid ----- arguments.  
(A) equivocal . . obstreperous  
(B) designated . . pertinent  
(C) comprehensive . . general  
(D) principal . . peripheral  
(E) subtle . . significant
- The ----- with which merchants and landowners in early-nineteenth-century Maryland and Virginia ----- Joshua Johnston's professional services attests to his artistic skill as a portrait painter.  
(A) avidness . . sought  
(B) diffidence . . purchased  
(C) patience . . replaced  
(D) elegance . . regarded  
(E) zealotry . . overlooked
- The man's colleagues characterized him as ----- because he had an irritable, quarrelsome disposition.  
(A) tyrannical (B) disingenuous  
(C) sanctimonious (D) cantankerous  
(E) morose

GO ON TO THE NEXT PAGE



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 9-12 are based on the following passages.**

*Passage 1 is by Dorothy Sayers; Passage 2 is adapted from a work by Raymond Chandler.*

**Passage 1**

The detective story does not and cannot attain the loftiest level of literary achievement. Though it deals with the most desperate effects of rage, jealousy, and revenge, it rarely touches the heights and depths of human passion. It presents us with an accomplished fact, and looks upon death with a dispassionate eye. It does not show us the inner workings of the murderer's mind—it must not, for the identity of the criminal is hidden until the end of the book. The most successful writers are those who contrive to keep the story running from beginning to end upon the same emotional level, and it is better to err in the direction of too little feeling than too much.

**Passage 2**

I think what was really gnawing at Dorothy Sayers in her critique of the detective story was the realization that her kind of detective story was an arid formula unable to satisfy its own implications. If the story started to be about real people, they soon had to do unreal things to conform to the artificial pattern required by the plot. When they did unreal things, they ceased to be real themselves. Sayers' own stories show that she was annoyed by this triteness. Yet she would not give her characters their heads and let them make their own mystery.

9. Which best describes the relationship between the two passages?
- (A) Passage 1 explains the evolution of a genre, while Passage 2 challenges the notion of a distinct genre.
- (B) Passage 1 discusses the constraints of a genre, while Passage 2 contends that many of these constraints are self-imposed.
- (C) Passage 1 celebrates a genre, while Passage 2 points out its deficiencies.
- (D) Passage 1 explains the popularity of a genre, while Passage 2 questions its commercial success.
- (E) Passage 1 compares a genre unfavorably to other types of writing, while Passage 2 argues that the genre has unique features.
10. The author of Passage 2 would most likely respond to the statement in lines 4-5, Passage 1 (“it rarely . . . passion”), by
- (A) arguing that this approach limits the characters' development
- (B) denying that most writers of detective stories rely on formulas
- (C) agreeing that strong emotions are out of place in detective stories
- (D) conceding that great literature is seldom commercially successful
- (E) concurring that readers are primarily interested in plot
11. Which of the following characteristics of detective stories presented in Passage 1 would be LEAST likely to be attributed to the “pattern” mentioned in line 19, Passage 2 ?
- (A) “cannot attain the loftiest level of literary achievement” (lines 1-2)
- (B) “deals with the most desperate effects of rage, jealousy, and revenge” (lines 2-4)
- (C) “presents us with an accomplished fact” (lines 5-6)
- (D) “looks upon death with a dispassionate eye” (line 6)
- (E) “does not show us the inner workings of the murderer's mind” (lines 7-8)
12. Passage 1 suggests that Sayers would most likely respond to lines 17-20, Passage 2 (“If the story started . . . themselves”), by pointing out that
- (A) great writers seldom explore the range of human emotions
- (B) detective stories do not address the consequences of people's emotions
- (C) detective stories are driven by the plot, not by the characters
- (D) readers of detective stories prefer unrealistic situations
- (E) real people often act in ways that are unexpected

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

*This passage is adapted from a series in which a college professor dramatizes the lectures of famous scientists from the past. Here he speaks as Louis Pasteur (1822-1895). In this part of the lecture, Pasteur has just described his discovery of the effect of heating certain microbes that infect bottled beverages (the process later named pasteurization).*

Line 5 But these undesirable microbes! Where and how did they arise? By spontaneous generation,\* as some believe? When I began to ask these questions of myself and of my students and colleagues, my close friends said: “Oh, no, do not waste your time on such worthless philosophical problems. Many a scientist has floundered and perished in the quagmire of spontaneous generation.” I replied: “But the origin of life is a profound problem.” With few exceptions, past discourses on spontaneous generation have been  
10 metaphysical exercises conducted with great passion, but without adding to our scientific knowledge.

I could not set aside my burning desire to bring a little stone, God willing, to the frail edifice of our knowledge of the deep mysteries of life and death, where all our intellects  
15 have so lamentably failed. In defense of nonapplied science I have repeatedly told my students that without theory, practice is but routine. Only theory is able to cause the spirit of invention to arise and develop. It is important that students should not share the opinion of those who disdain  
20 everything in science that has no immediate application. In science, chance favors only the mind that is prepared. I repeat: in science, chance favors only the mind that is prepared.

I first confirmed the experiments of the Italian abbé,  
25 Lazzaro Spallanzani, known also for his studies in gastric digestion. I made a nutritious broth, put it in a flask such as this [Pasteur holds up a large flask containing a brown solution], heated it to violent boiling, and then sealed the neck of the flask in a flame. My results agreed with those  
30 of Spallanzani: the broth remained pure. But if the neck be broken to admit air, the broth soon became putrid. My critics said that the heating made the air in the flask unfit for spontaneous generation. Only when fresh air is admitted can life begin anew. I argued in vain—even before our  
35 Academy of Sciences—that the putrefaction was caused by admission of bacteria. More convincing experiments were needed.

I opened flasks of sterilized broth in the cellar of the Paris observatory, where the air was still. Only one flask  
40 out of ten became putrid, whereas eleven flasks out of eleven opened in the courtyard quickly acquired a rich growth of bacteria. I journeyed to Mt. Montanvert in the Alps, where I opened twenty flasks of sterilized broth. Only one became putrid. I concluded that the air in the cellar and  
45 the air above the glacier were freer of bacteria than the air

in the city streets. But my adversaries performed similar experiments with different results. Perhaps they were not careful to follow my procedures. The neck of the flask must be heated first to kill the bacteria on the glass; then a heated  
50 instrument must be used to break the tip of the flask as it is held high above the head. Immediately thereafter the flask must be sealed again in a flame [Pasteur demonstrates the procedure]. In these difficult researches, while I sternly object to frivolous contradictions, I feel nothing but grati-  
55 tude toward those who warn me if I should be in error.

I then devised a conclusive experiment. I boiled a nutritious infusion in a flask with a long curved neck like this one. The tip of the neck was not sealed but left open to the outside air. Thus, there was no hindrance to the entrance of  
60 fresh air with its “vital force” as claimed by the advocates of spontaneous generation. But bacteria in the entering air would be trapped by the walls of the long glass tube. The fluid remained sterile so long as the flask was maintained in the vertical position. If, however, I contaminated the  
65 broth by allowing some of it to flow into the neck and then back into the flask, putrefaction promptly followed. So we see that life does not arise spontaneously. Life comes only from life.

\*The supposed origination of living matter directly from lifeless matter

13. The focus of the lecture is on how Pasteur

- (A) disproved an erroneous theory
- (B) documented and published his experiments
- (C) developed a process for killing microbes
- (D) applied his findings on spontaneous generation to new problems
- (E) contributed to the improvement of laboratory research standards

14. In the lecture, Pasteur concludes that the answer to the question “Where and how did they arise?” (lines 1-2) is

- (A) spontaneously
- (B) from airborne bacteria
- (C) from impurities in the original broth
- (D) from the curved neck of a flask
- (E) from a broken flask



15. In the first two paragraphs (lines 1-23), Pasteur is primarily concerned with
- (A) summarizing the results of his experiments about spontaneous generation
  - (B) criticizing those who have taken the passion out of science
  - (C) establishing his motivation for studying the origin of microbes
  - (D) attacking critics of his experiments
  - (E) correcting the impression that he is concerned only with experiments that have immediate application
16. The word “quagmire” (line 7) is used primarily to emphasize the
- (A) state of scientific ignorance in the 1800’s
  - (B) futility of a particular line of research
  - (C) moral dilemma faced by scientists like Pasteur
  - (D) failure of some to distinguish between pure and applied science
  - (E) tendency of unsuccessful scientists to look for simple solutions
17. Pasteur characterizes “past discourses on spontaneous generation” (line 9) as having
- (A) demonstrated the futility of practical scientific studies
  - (B) failed because of incomplete knowledge about sterilization of apparatus
  - (C) enabled him to understand inconsistencies in his early experiments
  - (D) failed to increase scientific knowledge
  - (E) resolved much of the controversy surrounding the issue
18. The “little stone” (lines 12-13) refers to the
- (A) slight addition that Pasteur hoped to make to the existing body of facts
  - (B) small effect that Pasteur wanted to have on one person’s learning
  - (C) minor disappointment Pasteur felt at being rebuffed by his colleagues
  - (D) narrow-mindedness of those who cling to scientific fallacies
  - (E) imperceptible progress that Pasteur had made in understanding spontaneous generation
19. Pasteur’s pronouncement about preparation and chance in lines 20-23 implies that
- (A) only projects that have an immediate application are important
  - (B) practice improves a scientist’s chances of making a significant discovery
  - (C) few scientists are lucky enough to devise useful theories
  - (D) work on projects that have no immediate application prepares scientists to exploit chance discoveries
  - (E) most scientific discoveries that have no immediate application are the result of good luck and timing
20. In context, the reference to the Academy of Sciences (line 35) serves to suggest why
- (A) Pasteur was so determined to make a significant contribution to scientific knowledge
  - (B) Pasteur felt compelled to replicate Spallanzani’s experiments
  - (C) spontaneous generation had already begun to be discredited when Pasteur began his experimentation
  - (D) Pasteur believed he needed to design experiments that were more persuasive
  - (E) spontaneous generation was viewed by Pasteur’s colleagues as a topic that was unfit for scientific study
21. In line 41, “rich” most nearly means
- (A) precious
  - (B) vital
  - (C) abundant
  - (D) meaningful
  - (E) productive
22. The “conclusive experiment” (line 56) performed by Pasteur was designed to answer critics who argued that
- (A) the apparatus used in Pasteur’s earlier experiments had not been adequately sterilized
  - (B) Pasteur’s experiments related to spontaneous generation had no immediate application
  - (C) the results of Pasteur’s experiments in the Alps and in the cellar could not be replicated
  - (D) the broth in the flasks of Pasteur’s earlier experiments was not nutritious enough
  - (E) heating made the air in the flasks of the earlier experiments unfit for spontaneous generation



23. In the context of the passage as a whole, the “vital force” (line 60) is best described as
- (A) what Pasteur called the basic unit of life
  - (B) a term that was outdated in Pasteur’s time
  - (C) nutrients necessary for sustaining life
  - (D) that which has the power to destroy life
  - (E) what opponents of Pasteur believed to be a source of life
24. In his conclusive experiment, Pasteur kept the flasks vertical (line 64) in order to
- (A) prevent fresh air from entering them
  - (B) retain the boiling liquid inside the flasks
  - (C) prevent the fluid from touching trapped bacteria
  - (D) avoid disturbing the solution inside
  - (E) replicate his previous experiments exactly

**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 3

Time — 25 minutes

20 Questions

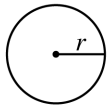
Turn to Section 3 (page 4) of your answer sheet to answer the questions in this section.

**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 scratchwork.

Notes

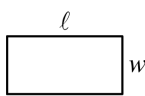
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not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

Reference Information

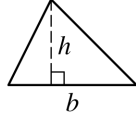


$$A = \pi r^2$$

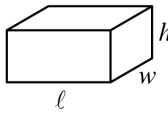
$$C = 2\pi r$$



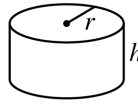
$$A = \ell w$$



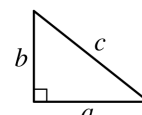
$$A = \frac{1}{2}bh$$



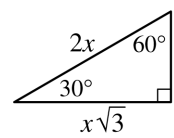
$$V = \ell wh$$



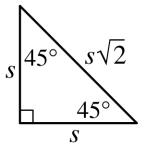
$$V = \pi r^2 h$$



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



Special Right Triangles

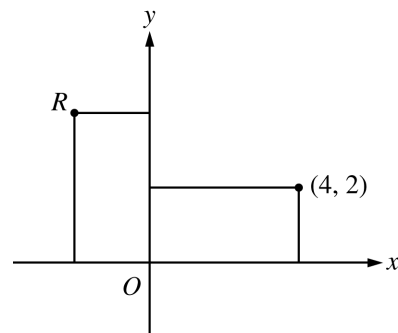


The number of degrees of arc in a circle is 360.

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

1. Which of the following represents the total cost, in dollars, of  $k$  compact discs at \$15 each and  $p$  compact disc cases at \$25 each? (Disregard sales tax.)

- (A)  $15k + 25p$   
 (B)  $25k + 15p$   
 (C)  $40(k + p)$   
 (D)  $0.40(k + p)$   
 (E)  $(15 + k)(25 + p)$



2. If the areas of the two rectangles in the figure above are equal, which of the following could be the coordinates of point  $R$ ?

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

GO ON TO THE NEXT PAGE

3. A box contains 2,900 solid-colored marbles that are either orange, blue, or green. If 29 percent of the marbles are orange and 29 percent of the marbles are blue, what percent are green?

(A) 29%  
(B) 42%  
(C) 52%  
(D) 58%  
(E) 71%

---

$$P = \{1, 3, 5, 6\}$$

$$Q = \{2, 4, 6, 7, 9\}$$

4. Sets  $P$  and  $Q$  are shown above. If  $x$  is a member of set  $P$  and  $y$  is a member of set  $Q$ , which of the following CANNOT be equal to the product  $xy$ ?

(A) 16  
(B) 18  
(C) 20  
(D) 21  
(E) 24

5. If  $\frac{1}{6} + \frac{1}{7} + \frac{1}{8} > \frac{1}{x} + \frac{1}{7} + \frac{1}{8}$ , then  $x$  could be which of the following?

(A) 3  
(B) 4  
(C) 5  
(D) 6  
(E) 7

6. If  $tx + 5 = (t + 1)x$ , which of the following must be true?

(A)  $x = 4$   
(B)  $x = 5$   
(C)  $t = 4$   
(D)  $t = 5$   
(E)  $t = 5x$

Questions 7-9 refer to the following definition.

Let # be defined by  $a \# b = ab + a + b$  for all numbers  $a$  and  $b$ .

7.  $2 \# 5 =$

- (A) 7
- (B) 10
- (C) 17
- (D) 20
- (E) 32

---

8. If  $10 \# h = 98$ , then  $h =$

- (A) 8
- (B) 9
- (C) 10
- (D) 11
- (E) 12

---

9. For what value of  $x$  is the statement  $x \# y = x$  always true?

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

$$3(x - 7)(x - 2) = k$$

10. In the equation above,  $k$  is a constant. If the roots of the equation are 7 and 2, what is the value of  $k$ ?

- (A) 0
- (B) 2
- (C) 3
- (D) 7
- (E) 14

---

11. Which of the following represents the area,  $A$ , of a circle as a function of its diameter,  $d$ ?

- (A)  $A(d) = \pi d$
- (B)  $A(d) = 2\pi d$
- (C)  $A(d) = \pi d^2$
- (D)  $A(d) = \frac{\pi d^2}{2}$
- (E)  $A(d) = \frac{\pi d^2}{4}$

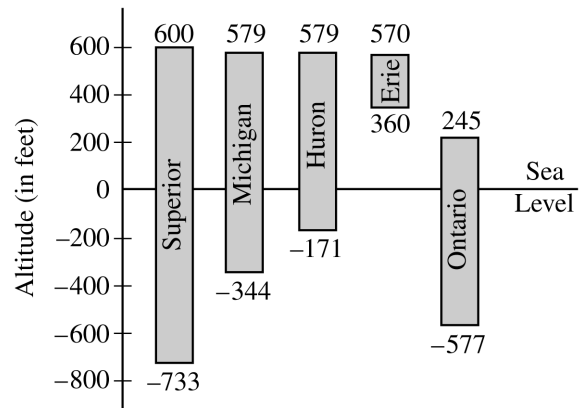
$x$	$f(x)$
4	5
8	$a$
12	9

$z$	$g(z)$
5	4
10	$b$
20	7

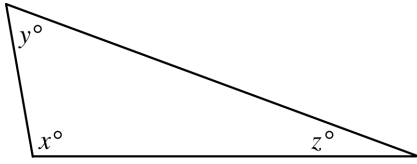
12. The table above shows some values for the functions  $f$  and  $g$ . If  $f$  and  $g$  are linear functions, what is the value of  $a - b$ ?

- (A) 0  
(B) 1  
(C) 2  
(D) 3  
(E) 4

ALTITUDE AT THE SURFACE AND LOWEST POINT FOR EACH OF THE GREAT LAKES



13. The depth of a lake is the difference between the altitude at the surface and at the lowest point of the lake. If the five lakes in the graph above were listed in order from the greatest depth to the least depth, which lake would be third in the list?
- (A) Erie  
(B) Huron  
(C) Michigan  
(D) Ontario  
(E) Superior



Note: Figure not drawn to scale.

14. In the figure above,  $x > 90$  and  $y = z + 1$ . If  $z$  is an integer, what is the greatest possible value of  $y$ ?

(A) 30  
(B) 45  
(C) 60  
(D) 61  
(E) 89

15. Molly is 64 inches tall. At 10:00 A.M. one day, her shadow is 16 inches long, and the shadow of a nearby tree is  $s$  inches long. In terms of  $s$ , what is the height, in inches, of the tree?

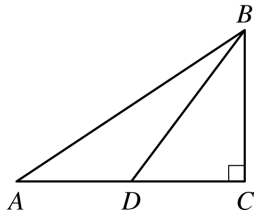
(A)  $s + 48$   
(B)  $2\sqrt{s}$   
(C)  $\frac{s}{4}$   
(D)  $4s$   
(E)  $\left(\frac{s}{2}\right)^2$

16. If a number is chosen at random from the set  $\{-12, -6, 0, 6, 12\}$ , what is the probability that it is a member of the solution set of both  $2x - 3 < 7$  and  $x + 5 > -6$ ?

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

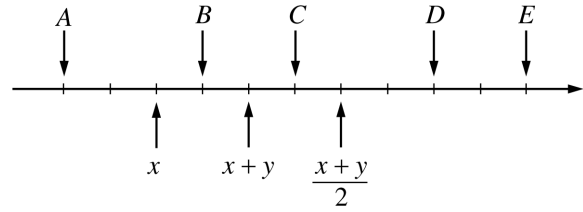
17. If the length of  $\overline{AB}$  is 5 and the length of  $\overline{BC}$  is 6, which of the following could be the length of  $\overline{AC}$ ?

(A) 10  
(B) 12  
(C) 13  
(D) 15  
(E) 16



Note: Figure not drawn to scale.

18. In triangle  $ABC$  above, if  $AD = 6$ ,  $DC = 3$ , and  $BC = 4$ , what is the area of triangle  $ABD$ ?
- (A) 36  
 (B) 18  
 (C) 12  
 (D) 6  
 (E) 3

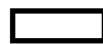


20. On the number line above, the tick marks are equally spaced. Which of the lettered points represents  $y$ ?
- (A)  $A$   
 (B)  $B$   
 (C)  $C$   
 (D)  $D$   
 (E)  $E$

19. If  $x$  and  $y$  are two different integers and the product  $35xy$  is the square of an integer, which of the following could be equal to  $xy$ ?
- (A) 5  
 (B) 70  
 (C) 105  
 (D) 140  
 (E) 350

**STOP**

If you finish before time is called, you may check your work on this section only.  
 Do not turn to any other section in the test.

**SECTION 5**

Time — 25 minutes

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) ●

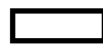
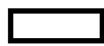
- After winning the lottery, John bought sports cars, built a mansion, and wore designer suits; however, by thus ----- his -----, he alienated his friends.
 

(A) enduring . . hardship  
 (B) flaunting . . prosperity  
 (C) undermining . . image  
 (D) calculating . . successes  
 (E) moderating . . consumption
- The study of biology, once considered the key to solving nature's mysteries, has instead served to emphasize nature's incredible -----.  
 (A) tranquillity (B) immobility (C) consistency  
 (D) desirability (E) complexity
- In 1575 Venetians instituted an annual celebration to ----- the end of the ----- that had struck the city.
 

(A) lament . . turmoil  
 (B) commemorate . . plague  
 (C) eulogize . . pestilence  
 (D) hail . . prosperity  
 (E) solemnize . . fame
- Lena Horne's singing style is such that she can invest even the most ----- lyrics with dramatic meaning.
 

(A) harmonious (B) sensational  
 (C) impeccable (D) vapid  
 (E) esteemed
- A long-standing theory about the migration of green turtles was ----- by an innovative marine biologist who graciously defused potential ----- by dedicating her work to the original researcher.
 

(A) instigated . . rancor  
 (B) renounced . . approval  
 (C) displaced . . attribution  
 (D) enhanced . . alteration  
 (E) repudiated . . acrimony



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

**Questions 6-7 are based on the following passage.**

Line On the morning of June 13, 1998, a 4.6-billion-year-old  
5 extraterrestrial object streaked into Earth's atmosphere and  
blew to pieces in the sky somewhere in the neighborhood  
of Nelda Wallace's backyard. A dark basketball-size object  
dropped with a loud *ssshht* into Wallace's garden, and  
fragments pelted other properties—only the first of many  
10 strange things soon to occur in town. For meteorites are  
more than just stars of science-fiction movies. Scientists  
covet them, private dealers scoop them up for resale at  
spiraling prices, and professional searchers travel the  
world to hunt them down. Nelda Wallace's town was  
about to be invaded by meteorite dealers, meteorite  
fans, meteorite poachers, and other alien life-forms.

6. The sentence in lines 1-4 (“On the morning . . . backyard”) is best characterized as

- (A) ironic
- (B) dramatic
- (C) comical
- (D) nostalgic
- (E) celebratory

7. The reference to the “alien life-forms” (line 13) primarily serves to

- (A) hint at the dangers posed by some unexpected visitors
- (B) mock the public's fascination with extraterrestrial beings
- (C) indicate the dearth of reliable information about a subject
- (D) acknowledge a lack of familiarity with a scientific phenomenon
- (E) provide a humorous label for a certain kind of zealotry

**Questions 8-9 are based on the following passage.**

Line Apes raised by humans seem to pretend more frequently  
5 than do apes in the wild. Animal handlers see behaviors  
they interpret as pretending practically every day. But Anne  
Russon, a psychologist, says she has found only about 20  
6 recorded cases of possible pretending in free-ranging  
orangutans, culled from thousands of hours of observation.  
One possible reason, she noted in an e-mail interview from  
her field station in Borneo, is that researchers have not been  
10 looking for such behavior. But many researchers believe  
that interaction with humans—and the encouragement to  
pretend that comes with it—may play a major role in why  
domesticated apes playact more.

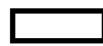
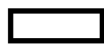
8. Russon's hypothesis would be most fully tested by which possible research project?

- (A) Examining data from observations of pretending behavior in apes other than orangutans
- (B) Expanding ongoing observations of orangutans to include pretending behavior
- (C) Documenting pretending behavior among orangutans raised by humans
- (D) Comparing specific pretending behaviors in free-ranging and domesticated orangutans
- (E) Reviewing existing data on free-ranging orangutans to determine the earliest record of pretending behavior

9. Which theoretical statement about pretending behavior in apes would be supported most fully by the “many researchers” mentioned in line 9 ?

- (A) Having the ability to pretend has enabled apes, such as chimpanzees, to be trained as performers.
- (B) All types of apes, both wild and domesticated, can pretend with human companions.
- (C) Pretending behavior for wild apes may vary considerably by region and population.
- (D) Handlers of domesticated apes do not always have the rigorous observational training of scientists.
- (E) Wild apes living apart from humans pretend only rarely.





**Questions 10-18 are based on the following passage.**

*This excerpt is from a short story by a Japanese American writer. The narrator reflects on her family's past as she helps her mother prepare to move from her home.*

There's a photograph of my mother standing on the pier in Honolulu in 1932, the year she left Hawaii to attend the University of California. She's loaded to the ears with leis.

Line She's wearing a fedora<sup>1</sup> pulled smartly to the side. She is  
5 not smiling. Of my mother's two years at the university, my grandmother recalled that she received good grades and never wore a kimono again. My second cousin, with whom my mother stayed when she first arrived, said she was surprisingly sophisticated—she liked hats. My mother  
10 said that she was homesick. Her favorite class was biology and she entertained thoughts of becoming a scientist. Her father, however, wanted her to become a teacher, and his wishes prevailed, even though he would not have forced them upon her. She was a dutiful daughter.

15 During her second year, she lived near campus with a mathematics professor and his wife. In exchange for room and board she cleaned house, ironed, and helped prepare meals. One of the things that survives from this period is a black composition book entitled *Recipes of California*. As  
20 a child, I read it like a book of mysteries for clues to a life both alien and familiar. Some entries she had copied by hand; others she cut out of magazines and pasted on the page, sometimes with a picture or drawing. The margins contained her cryptic comments: "Saturday bridge club,"  
25 "From Mary G. Do not give away."

That book holds part of the answer to why our family rituals didn't fit the norm either of our relatives or of the larger community in which we grew up. At home, we ate in fear of the glass of spilled milk, the stray elbow on the  
30 table, the boarding house reach. At my grandparents', we slurped our chasuke<sup>2</sup>. We wore tailored dresses and black shoes with white socks; however, what we longed for were the lacy colorful dresses that other girls wore to church on Sunday. For six years, I marched to Japanese language  
35 school after my regular classes; however, we only spoke English at home. We talked too loudly and all at once, which mortified my mother, but she was always complaining about Japanese indirectness. I know that she smarted under a system in which the older son is the center of the familial  
40 universe, but at thirteen I had a fit of jealous rage over her fawning attention to our only male cousin.

My sister has found a photograph of our mother, a round-faced and serious twelve or thirteen, dressed in a kimono and seated, on her knees, on the tatami mat. She is  
45 playing the koto, a difficult stringed instrument thought to teach girls discipline. Of course, everything Japanese was a lesson in discipline—flower arranging, embroidery,

everything. One summer my sister and I had to take ikebana, the art of flower arrangement, at our grandfather's school. The course was taught by Mrs. Oshima, a soft-spoken, terrifying woman, and my supplies were provided by my grandmother, whose tastes ran to the oversized. I remember little of that class and its principles. What I remember most clearly is having to walk home carrying  
55 one of our creations, which, more often than not, towered above our heads.

How do we choose among what we experience, what we are taught, what we run into by chance, or what is forced upon us? What is the principle of selection? My  
60 sisters and I are not bound by any of our mother's obligations, nor do we follow the rituals that seemed so important. My sister once asked, do you realize that when she's gone that's *it*? She was talking about how to make sushi<sup>3</sup>, but it was a more profound question nonetheless.

<sup>1</sup> A fedora is a soft felt hat popular in the United States in the 1930's.

<sup>2</sup> Chasuke is a rice and tea mixture.

<sup>3</sup> Sushi is cold rice shaped into small cakes and sometimes topped or wrapped with garnishes.

**10.** The thematic focus of the passage is on the

- (A) conflicts between the narrator's mother and grandmother
- (B) challenge of balancing conflicting values and practices
- (C) widespread assimilation of immigrants into the culture of the United States
- (D) desirability of maintaining traditions
- (E) irrelevance of traditional customs to modern society

**11.** The grandmother's comments in lines 5-7 imply that her daughter's experiences at the university were characterized by

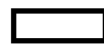
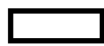
- (A) success and camaraderie
- (B) accomplishment and assimilation
- (C) enlightenment and introspection
- (D) diligence and homesickness
- (E) scholarship and competition

**12.** In line 11, the word "entertained" most nearly means

- (A) regaled
- (B) hosted
- (C) flaunted
- (D) harbored
- (E) welcomed



13. The narrator's statement in line 14 ("She . . . daughter") serves to
- (A) defend her mother's interest in science
  - (B) justify her mother's decision to leave home
  - (C) explain why her mother became a teacher
  - (D) question the relevance of established customs
  - (E) rationalize her grandfather's actions
14. The narrator suggests that as a child she read her mother's book of recipes in order to
- (A) seek proof of her mother's devotion to the family
  - (B) understand more fully the contradictions in her mother's behavior
  - (C) perpetuate the fantasy she created about her mother
  - (D) search for clues to her mother's reluctance to discuss her past
  - (E) discover the cause of her mother's unhappiness
15. The description of the reaction of the mother to her children's manner of speaking (lines 36-38) highlights how she
- (A) feared that her children's naïveté would invite trouble
  - (B) shared her children's distaste for Japanese language lessons
  - (C) was still imbued with the lessons of her culture
  - (D) insisted on maintaining a strong Japanese influence in her home
  - (E) wanted her children to be fluent in the Japanese language
16. The narrator repeats the word "everything" in lines 46-48 to
- (A) explain the intensity of her competition with her sister
  - (B) characterize the diverse achievements of Japanese Americans
  - (C) describe her mother's single-minded pursuit of perfection
  - (D) emphasize the extent to which discipline governed Japanese life
  - (E) highlight the extraordinary skill required to master the koto
17. In lines 53-56, the narrator's description of childhood walks home from ikebana class conveys a sense of
- (A) adventure
  - (B) relief
  - (C) melancholy
  - (D) absurdity
  - (E) vitality
18. To the narrator, her sister's question (lines 62-63) implies that the
- (A) mother represented the last true vestige of the sisters' Japanese heritage
  - (B) mother should have made more of an effort to educate her daughters about their background
  - (C) mother's education in California extended beyond the confines of the university
  - (D) sisters were saddened by their mother's decision to move
  - (E) sisters would not regret the absence of traditional family rituals

**Questions 19-24 are based on the following passage.**

*The following passage is excerpted from a historian's examination of European attitudes toward childhood.*

Medieval European art until about the twelfth century did not know childhood or did not attempt to portray it. It is hard to believe that this neglect was due to incompetence or incapacity; it seems more probable that there was no place for childhood in the medieval world. A miniature painted during the twelfth century provides us with a striking example of the deformity that an artist at that time would inflict on the representation of children's bodies. The subject is a Biblical scene in which Jesus is surrounded by little children. Yet the miniaturist has grouped around Jesus what are obviously eight men, without any characteristics of childhood; they have simply been depicted on a smaller scale. In a French miniature of the late eleventh century, three children brought to life by a saint are also reduced to a smaller scale than the adults, without any other difference in expression or features. A painter would not hesitate to give the body of a child the musculature of an adult.

In the world of pictorial formulas inherited from ancient Rome, right up to the end of the thirteenth century, there are no children characterized by a special expression, but only adults on a reduced scale. This refusal to accept child morphology\* in art is to be found too in most of the ancient civilizations. A fine Sardinian bronze of the ninth century B.C. shows a mother holding in her arms the bulky body of her son. The museum catalog tells us: "the little masculine figure could also be a child which, in accordance with the formula adopted in ancient times by other peoples, had been represented as an adult." Everything in fact would seem to suggest that the realistic representation of children or the idealization of childhood was confined to ancient Greek art. Representations of Eros, the Greek child god of love, proliferated in that Hellenistic period, but childhood disappeared from art together with the other Hellenistic themes, and the subsequent Romanesque art returned to the rejection of the special features of childhood.

This is no mere coincidence. Our starting point in this study is a world of pictorial representation in which childhood is unknown; literary historians such as Calvé have made the same observation about the medieval epic, in which child prodigies behave with the courage and physical strength of doughty warriors. This undoubtedly meant that the people of the tenth and eleventh centuries did not dwell on the image of childhood and that the image had neither interest nor even reality for them. It suggests too that in the realm of real life, and not simply in that of aesthetic translation, childhood was a period of transition that passed quickly and that was just as quickly forgotten.

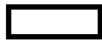
\* Structure and form

19. The first two paragraphs (lines 1-37) primarily serve to
- (A) argue against the depiction of children in artwork
  - (B) suggest that medieval Western art was particularly conservative
  - (C) describe the unrealistic portrayal of children in medieval art
  - (D) trace the evolution of realistic representation in Western art
  - (E) postulate a theory about the thematic focuses of medieval Western art
20. The author's argument about the depiction of children in medieval art assumes that the depictions
- (A) suggest the connection between medieval art and religion
  - (B) prefigure the gradual shift to realism
  - (C) are too varied to support any one argument
  - (D) reflect earlier civilizations' corruption
  - (E) offer an indication of commonly held attitudes
21. The author's argument is developed primarily by
- (A) quotations from literary sources
  - (B) descriptions of visual evidence
  - (C) psychological analyses of medieval artists
  - (D) comparisons of modern and medieval images of the body
  - (E) reflections on the philosophical nature of childhood
22. The last sentence of the passage (lines 46-50) primarily serves to
- (A) define an important term that is central to the author's argument
  - (B) dismiss objections to the author's thesis
  - (C) provide an explanation for the phenomenon discussed in the previous paragraphs
  - (D) introduce examples from other time periods and other forms of representational art
  - (E) summarize the views of other historians of medieval art

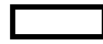
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5



5

23. In line 48, “translation” most nearly means

- (A) substitution
- (B) explanation
- (C) representation
- (D) transportation
- (E) correction

24. The author offers which explanation for the way that medieval painters depicted children?

- (A) Children were discouraged from becoming artists’ models.
- (B) Children were more difficult to paint than adults.
- (C) Children had never been a subject of art in Western traditions.
- (D) Childhood was not understood as a separate phase of life.
- (E) Childhood was not recognized in medieval theology.

**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

18 Questions

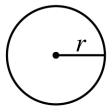
Turn to Section 6 (page 6) of your answer sheet to answer the questions in this section.

**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 scratchwork.

Notes

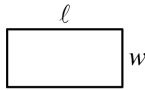
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not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

Reference Information

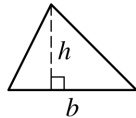


$$A = \pi r^2$$

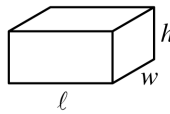
$$C = 2\pi r$$



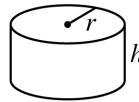
$$A = \ell w$$



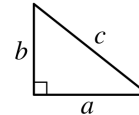
$$A = \frac{1}{2}bh$$



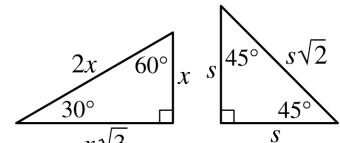
$$V = \ell wh$$



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



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



Special Right Triangles

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

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

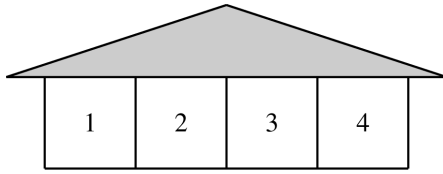
1. Which of the following triples  $(a, b, c)$  does NOT satisfy the equation  $a \cdot b + c = 15$ ?

- (A) (2, 6, 3)  
 (B) (2, 7, 1)  
 (C) (3, 5, 0)  
 (D) (4, 3, 3)  
 (E) (5, 2, 4)

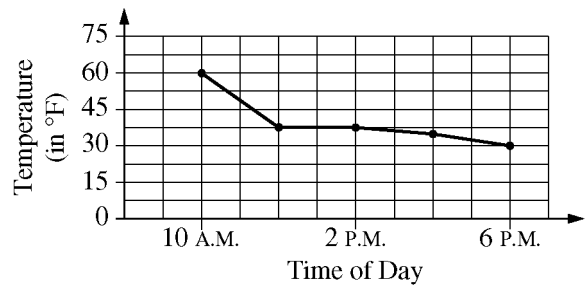
2. An amusement park charges \$7 more for an adult's admission than for a child's admission. If a group of 4 adults and 3 children spent \$119 on admission, what is the price of admission for one child?

- (A) \$11  
 (B) \$13  
 (C) \$16  
 (D) \$17  
 (E) \$18

GO ON TO THE NEXT PAGE



3. The figure above shows four apartments in a building. In this building, each apartment is occupied by only one person. Alice lives next to Sam, and Paul lives next to Alice and Dara. In which apartment could Alice live?
- (A) 1 only  
 (B) 2 only  
 (C) 3 only  
 (D) 2 or 3  
 (E) 1 or 4



5. The graph above shows various temperatures from 10 A.M. to 6 P.M. of a given day. Which of the following situations best fits the information on the graph?
- (A) It rained a little, and then the Sun came out and warmed things up.  
 (B) The mild temperature was lowered by a heavy rain in the morning, and the temperature dropped lower by evening.  
 (C) It was more windy in the morning than it was in the evening, and the temperature was mild throughout.  
 (D) The morning was cold, but the Sun later came out and raised the temperature.  
 (E) The temperature decreased at a constant rate from 10 A.M. to 6 P.M.

4. What is the ratio of the radius  $r$  of a circle to the circumference of the circle?
- (A)  $1:2\pi$   
 (B)  $1:\pi$   
 (C)  $1:\pi r$   
 (D)  $\pi:1$   
 (E)  $2\pi:1$



6. Rita's dog weighed 5 pounds when she bought it. Over the next several years, the dog's weight increased by 10 percent per year. Which of the following functions gives the weight,  $w$ , in pounds, of the dog after  $n$  years of weight gain at this rate?
- (A)  $w(n) = 5 + 0.1n$   
(B)  $w(n) = 5(0.1)^n$   
(C)  $w(n) = 5(0.9)^n$   
(D)  $w(n) = 5(1.1)^n$   
(E)  $w(n) = 5(n)^{1.1}$
7. If all four interior angles of quadrilateral  $P$  have the same measure, which of the following statements must be true?
- I. All sides of  $P$  have equal length.  
II. The diagonals of  $P$  are perpendicular.  
III. The measure of each interior angle of  $P$  is  $90^\circ$ .
- (A) None  
(B) I only  
(C) II only  
(D) III only  
(E) I, II, and III
- 
8. If  $x = 5^y$  and  $y = z + 1$ , what is  $\frac{x}{5}$  in terms of  $z$ ?
- (A)  $z$   
(B)  $z + 1$   
(C)  $5^z$   
(D)  $5^z + 1$   
(E)  $5^{z+1}$



**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 scratchwork.

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

Write answer in boxes. →

	7	/	1	2
	●	/	/	
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	●	○	○	○
8	○	○	○	○
9	○	○	○	○

← Fraction line

Grid in result. →

Answer: 2.5

	2	.	5
	/	/	●
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○
5	○	○	○
6	○	○	○
7	○	○	○
8	○	○	○
9	○	○	○

← Decimal point

Answer: 201

Either position is correct.

	2	0	1
	/	/	
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○

	2	0	1
	/	/	
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○

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

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

3.5 or  $7/2$ . (If  $\begin{array}{|c|c|c|c|} \hline 3 & 1 & / & 2 \\ \hline \bullet & \bullet & \bullet & \bullet \\ \hline \end{array}$  is gridded, it will be interpreted as  $\frac{31}{2}$ , not  $3\frac{1}{2}$ .)

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

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

	2	/	3
	/	●	
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○
5	○	○	○
6	○	○	○

	.	6	6	6
	●	/	/	
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○

	.	6	6	7
	●	/	/	
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○

A	D	1	4	7
B	E	2	5	8
C	F	3	6	9

9. A snack machine has buttons arranged as shown above. If a selection is made by choosing a letter followed by a one-digit number, what is the greatest number of different selections that could be made?

10. If  $2x + 3y = 21$  and  $x$  and  $y$  are positive integers, what is one possible value of  $x$ ?

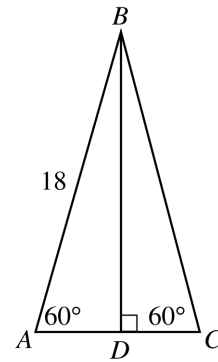




11. A rectangular-shaped field has a perimeter of 400 feet and a width of 80 feet. What is the area of the field in square feet?

13. If  $x$  divided by one-half is 50, what is the value of  $x$ ?

12. If  $(3 \times 10^n) + (5 \times 10^4) = (5.03 \times 10^4)$ , what is the value of  $n$ ?



Note: Figure not drawn to scale.

14. In  $\triangle ABC$  above, what is the length of  $\overline{AD}$ ?



15. The sum of the positive odd integers less than 100 is subtracted from the sum of the positive even integers less than or equal to 100. What is the resulting difference?

17. Fifty percent of the songs played on a certain radio station are 3 minutes long, 30 percent are 5 minutes long, and 20 percent are 2 minutes long. What is the average (arithmetic mean) number of minutes per song played on this radio station?

---

$$f(x) = kg(x) + 2$$

16. The function  $f$  above is defined in terms of another function  $g$  for all values of  $x$ , where  $k$  is a constant. If  $t$  is a number for which  $f(t) = 30$  and  $g(t) = 8$ , what does  $k$  equal?

- 
18. A large solid cube is assembled by gluing together identical unpainted small cubic blocks. All six faces of the large cube are then painted red. If exactly 27 of the small cubic blocks that make up the large cube have no red paint on them, how many small cubic blocks make up the large cube?

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.



## SECTION 7

Time — 25 minutes

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. William Faulkner, being that he was a Southern writer, used Mississippi as a setting for most of his novels.
  - (A) being that he was a Southern writer
  - (B) a Southern writer
  - (C) while a writer from the South
  - (D) in origin a writer of the South
  - (E) because of him being a writer from the South
2. Tadpoles hatch and metamorphose into small replicas of adult frogs although remaining in their aquatic birthplace.
  - (A) although remaining
  - (B) while remaining
  - (C) in spite of it remaining
  - (D) due to their remaining
  - (E) in the course of which they remain

3. You cannot expect to treat your friends badly and no one notices.
  - (A) and no one notices
  - (B) and have no one notice
  - (C) without notice by someone
  - (D) without notice by no one
  - (E) without the result of somebody noticing
4. The memoirs of President Clinton begin with his childhood in Arkansas and culminate in his rise to the presidency.
  - (A) begin with his childhood in Arkansas and culminate
  - (B) that begin with his childhood in Arkansas and culminate
  - (C) have begun with his childhood in Arkansas and culminate
  - (D) have begun with his childhood in Arkansas and culminating
  - (E) began with his childhood in Arkansas and are culminated
5. Because of ignoring its potential, biofeedback is a medical therapy most physicians reject.
  - (A) Because of ignoring its potential, biofeedback is a medical therapy most physicians reject.
  - (B) Biofeedback is rejected by most physicians because of their ignoring its potential.
  - (C) Most physicians, because of ignoring the potential of biofeedback, and rejecting it.
  - (D) Most physicians reject biofeedback because they ignore its potential.
  - (E) A medical therapy rejected by most physicians, caused by ignoring its potential, is biofeedback.

GO ON TO THE NEXT PAGE 



6. In *Death of a Salesman* Willy Loman mistakenly believes that his sons have no flaws, believing which leads to many problems for the entire family.
- (A) believing which leads
  - (B) a belief that leads
  - (C) and which is to lead
  - (D) the belief of which leads
  - (E) his believing this leads
7. Clara Barton, an American nurse, whose influence as a reformer in the field of health care almost equals that of Florence Nightingale.
- (A) Clara Barton, an American nurse, whose influence as a reformer
  - (B) Clara Barton, who was an American nurse and whose influence as a reformer
  - (C) An American with influence as a nursing reformer, Clara Barton
  - (D) Clara Barton was an American nurse whose influence as a reformer
  - (E) An American, Clara Barton who was a nursing reformer and whose influence
8. During the summer months, several thousand people a day visit the park, which is known for its waterfalls and rock formations.
- (A) During the summer months, several thousand people a day visit the park, which is known for its waterfalls and rock formations.
  - (B) Known for its waterfalls and rock formations, several thousand people a day visit the park during the summer months.
  - (C) Several thousand people a day visit the park during the summer months known for its waterfalls and rock formations.
  - (D) Several thousand people had visited the park a day, which is known for its waterfalls and rock formations during the summer months.
  - (E) During the summer months, knowing its waterfalls and rock formations, several thousand people a day visit the park.
9. Although the candidate promised both to cut taxes and improve services, he failed to keep either of them after the election.
- (A) Although the candidate promised both to cut taxes and improve services, he
  - (B) The candidate, having promised both to cut taxes and improve services,
  - (C) Although the candidate made promises both to cut taxes and improve services, he
  - (D) Having promised, first, to cut taxes and, second, to improve services, the candidate
  - (E) The candidate's promises were both to cut taxes and improve services, he
10. The students found fieldwork in the state forest more exciting and dangerous than any of them had anticipated, having to be rescued by helicopter during a fire.
- (A) anticipated, having to be
  - (B) anticipated; when they had to be
  - (C) anticipated: they had to be
  - (D) anticipated: among which was their
  - (E) anticipated, and so they had been
11. Chinese watercolors have become more popular than American and European artists who are their contemporaries.
- (A) American and European artists who are their contemporaries
  - (B) contemporary American and European artists
  - (C) those by contemporary American and European artists of the period
  - (D) those of American and European pictures of the same period
  - (E) those by contemporary American and European artists



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) ● (C) (D) (E)

12. By next year the old vaudeville theater had been  
 A  
 converted into two small theaters in which films  
 B C  
 can be shown . No error  
 D E
13. Some scholars studying the writings of Emily Brontë  
 A  
have become increasingly interested in the  
 B C  
 relationships between her siblings and she . No error  
 D E
14. At the 1984 Olympic Games, John Moffet and Pablo  
 Morales, who were swimmers on the United States  
 A B  
 team, set world records. No error  
 C D E

15. Both Dorothy Sayers plus Carolyn Heilbrun  
 A  
have written scholarly works as well as popular  
 B C  
 murder mysteries, demonstrating a diversity of  
 D  
 talents and interests. No error  
 E
16. Although the coach had predicted that the team  
 A B  
 would have a winning season, the fans were surprised  
 C  
 by the success of the young, inexperienced players.  
 D  
No error  
 E
17. Because they must compete with a large chain of  
 A  
 super-stores that can afford to charge very low rates for  
 certain items, the owners of small hardware stores  
 know that you are unlikely to make much profit  
 B C  
and may , in fact, go bankrupt. No error  
 D E
18. Although science offers the hope of preventing  
 A  
 serious genetic diseases, there is difficult ethical  
 B  
 questions raised by the possibility of altering human  
 C D  
 heredity. No error  
 E



19. In the nineteenth century, careers in business and law

were prestigious, but it did not require practitioners  
A B C  
to hold college degrees. No error  
D E

20. Chess players find that playing against a computer

is helpful to improve their skills, even though no  
A B C  
chess-playing computer has yet won a championship.  
D

No error  
E

21. Reaching lengths of twelve inches, banana slugs are  
A B

the much larger of all the slug species that inhabit  
C D

North America. No error  
E

22. Maya Madera proudly wore her sister's  
A

most popular invention, a watch for winter campers  
B

that flashes the temperature in lighted numerals and  
C

sends out a loud alarm when pressing a button .  
D

No error  
E

23. Obviously , Whistler's paintings, unlike Klee , are  
A B

conventional in their subject matter. No error  
C D E

24. A newly formed organization of homeowners and

business people have met with the transportation  
A

department to voice its concerns about plans for  
B C D

a shopping mall in the community. No error  
E

25. Although she considers her chemistry research  
A

complete, she has heeded her professor's advice  
B C

and is conducting three additional experiments.  
D

No error  
E

26. Princeton University officials first broke with  
A

a tradition of awarding honorary degrees only  
B

to men when they awarded it to author Willa  
C D

Cather. No error  
E



27. His love of politics led him to volunteer in local  
                                  A    B  
campaigns as well as a job in a government office  
                                  C            D  
in the state capital. No error  
  E

28. Now that Michiko finished the research, she feels  
  A  
reasonably confident about writing her paper  
                                  B    C  
on the rise of the progressive movement in the  
  D  
United States. No error  
  E

29. The condition known as laryngitis usually causes  
  A  
the vocal cords and surrounding tissue to swell, thus  
  B  
preventing the cords to move freely. No error  
  C            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 are based on the following.**

(1) A significant problem all across our state is garbage. (2) Our landfills are full. (3) It seems that we must either find new sites for landfills or employ other methods of disposal, like incineration. (4) Unfortunately, there are drawbacks to every solution that they think of. (5) Polluted runoff water often results from landfills. (6) With incineration of trash, you get air pollution. (7) People are criticized for not wanting to live near a polluting waste disposal facility, but really, can you blame them?

(8) Recycling can be an effective solution, but owners of apartment complexes and other businesses complain that recycling adds to their expenses. (9) Local governments enjoy the benefits of taxes collected from business and industry. (10) They tend to shy away from pressuring such heavy contributors to recycle.

(11) Perhaps those of us being concerned should encourage debate about what other levels of government can do to solve the problems of waste disposal. (12) We should make a particular effort to cut down on the manufacture and use of things that will not decompose quickly. (13) Certainly we should press individuals, industries, and all levels of government to take responsible action while we can still see green grass and trees between the mountains of waste.

30. Which of the following would fit most logically between sentences 1 and 2 ?

- (A) A sentence citing examples of states that have used up available landfills
- (B) A sentence citing examples of successful alternatives to landfills
- (C) A sentence citing the number of new landfills in the state
- (D) A sentence citing the number of illnesses blamed on polluted water in the state
- (E) A sentence citing the average amount of trash disposed of annually by each person in the state



31. Which of the following is the best way to phrase the underlined portion of sentence 4 (reproduced below) ?

*Unfortunately, there are drawbacks to every solution that they think of.*

- (A) (as it is now)
  - (B) that was thought of
  - (C) that they have previously come up with
  - (D) to which there are proposals
  - (E) that has been proposed
32. Which of the following is the best way to revise and combine sentences 5 and 6 (reproduced below) ?
- Polluted runoff water often results from landfills. With incineration of trash, you get air pollution.*
- (A) With landfills, polluted runoff water will result, and whereas with incineration of trash, you get air pollution.
  - (B) While on the one hand are landfills and polluted runoff water, on the other hand you have air pollution in the case of incineration of trash.
  - (C) Landfills often produce polluted runoff water, and trash incineration creates air pollution.
  - (D) Landfills and incineration that produce water and air pollution.
  - (E) Runoff water is from new landfills; from incineration of trash, there is air pollution.
33. If sentence 8 were rewritten to begin with the clause “*Although recycling can be an effective solution,*” the next words would most logically be
- (A) and owners of apartment complexes and other businesses complain
  - (B) yet owners of apartment complexes and other businesses complain
  - (C) owners of apartment complexes and other businesses complain
  - (D) mostly owners of apartment complexes and other businesses are complaining
  - (E) owners of apartment complexes and other business complained

34. In context, which of the following is the best way to combine sentences 9 and 10 ?

- (A) Local governments enjoy the benefits of taxes collected from business and industry, as they tend to shy away from pressuring such heavy contributors to recycle.
  - (B) Because local governments enjoy the benefits of taxes collected from business and industry, they tend to shy away from pressuring such heavy contributors to recycle.
  - (C) However, local governments enjoy the benefits of taxes collected from business and industry, they tend to shy away from pressuring such heavy contributors to recycle.
  - (D) In addition to enjoying the benefits of taxes collected from business and industry, local governments tend to shy away from pressuring business and industry into recycling.
  - (E) Local governments, enjoying the benefits of taxes collected from business and industry, they tend to shy away from pressure to recycle.
35. Which of the following is the best phrasing for the underlined portion of sentence 11 (reproduced below) ?
- Perhaps those of us being concerned should encourage debate about what other levels of government can do to solve the problems of waste disposal.*
- (A) (as it is now)
  - (B) those of us who are concerned
  - (C) those concerned ones of us
  - (D) we, being among those who are concerned,
  - (E) we who are those being concerned

**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

(A) (B) (C) (D) ●

- Most pioneers ----- this valley on their journey to the West because its rugged terrain and frequent landslides made it a ----- place for travelers.
 

(A) flanked . . fascinating  
 (B) avoided . . necessary  
 (C) encompassed . . curious  
 (D) enjoyed . . troublesome  
 (E) skirted . . hazardous
- Ballads often praise popular figures who have performed feats that many perceive as -----, such as defending the poor or resisting ----- authority.
 

(A) modest . . acceptable  
 (B) inescapable . . legitimate  
 (C) insufficient . . overpowering  
 (D) admirable . . unjust  
 (E) unbelievable . . tolerable
- The serious purpose of the paper-airplane flying contest, which attracted many novel and sometimes truly ----- entries, was to determine whether any ----- aerodynamic designs could be discovered.
 

(A) unorthodox . . conventional  
 (B) bizarre . . revolutionary  
 (C) derivative . . imaginative  
 (D) mundane . . predictable  
 (E) ungainly . . aesthetic
- Carson presents her case so strongly and logically that only the prejudiced or the ----- will attempt to ----- her.
 

(A) impartial . . defy  
 (B) doubtful . . champion  
 (C) gullible . . believe  
 (D) obstinate . . contradict  
 (E) irrational . . follow
- Over the years the anthropologist's opinions had -----: he refused to tolerate new ideas and nothing could change his mind.
 

(A) digressed (B) proliferated (C) ossified  
 (D) germinated (E) incubated
- As the first ----- of the political campaign, the senator unleashed a spirited verbal attack on her leading opponent.
 

(A) salvo (B) encore (C) palliative  
 (D) concession (E) demurral



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

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

*The following passages are taken from testimony given before congressional committees about how government funding affects the arts. The author of the first passage is a writer and radio entertainer; the author of the second passage is a novelist and critic.*

**Passage 1**

Line All governments have honored artists when they are  
5 to support the arts—support the act of creation itself—and  
to encourage artists who are young and dangerous and  
unknown and very much alive. This courageous legislation  
has changed American life.

Forty years ago, if American men or women meant to  
have artistic careers, they got on the train to New York.  
10 Today, you can be a violinist in North Carolina, a writer in  
Iowa, a painter in Utah. This is a small and lovely revolution  
that the National Endowment for the Arts (NEA) has  
helped to bring about. The Endowment has fostered thou-  
sands of artistic works—many of which will outlive you  
15 and me—but even more important, the Endowment has  
changed how we think about the arts. Today, no American  
family can be secure against the danger that one of its chil-  
dren may decide to become an artist.

I grew up in a family that never attended concerts or  
20 museums, never bought books. I never imagined that a  
person could be a writer.

Twice in my life, at crucial times, grants from the  
Endowment made it possible for me to be a writer. The  
first, in 1969, arrived when I was young, broke, married  
25 with a baby, living on very little cash and a big vegetable  
garden. I was writing for *The New Yorker* at the time, but  
they weren't aware of it. I wrote every morning and every  
night. I often had fantasies of finding a patron—a beggar  
would appear at my door, I'd give him an egg salad sand-  
30 wich, and suddenly he'd turn into a man in a pinstripe suit,  
Prince Bob from a philanthropic foundation. But instead, I  
got a letter offering me a job for one month in the Writers  
in the Schools program in Minneapolis, funded by the  
NEA, which sent young writers into the schools to read  
35 and teach.

In 1974 a grant from the NEA enabled me and my col-  
leagues at a public radio station to start a new radio series.

By the time the show became popular, the Endowment had  
vanished from the credits, its job done.

40 When you're starting out, it seems like nobody wants  
to give you a dime, and then, when you have big success  
and have everything you could ever want, people can't do  
enough for you. The Endowment is there at the beginning,  
and that's the beauty of it.

**Passage 2**

45 I love my country's government for its attempt in a pre-  
carious world to sustain a peaceful order in which work can  
be done and happiness can be pursued, not for the good of  
the state, but in a state that exists for our good.

I love my government not least for the extent to which  
50 it leaves me alone. My personal ambition has been simply  
to live by the work of my pen. This is not a very fastidious  
ambition. If I were aware of large amounts of federal money  
available to purveyors of the written word, I would attempt  
55 to gain access to it and hope to please the administrators of  
this fund as I hope to please magazine editors and book  
buyers.

But I would rather have as my patron a host of anony-  
mous citizens digging into their own pockets for the price  
of a book or a magazine than a small body of enlightened  
60 and responsible people administering public funds. I would  
rather chance my personal vision of the truth striking home  
here and there in the chaos of publication that exists than  
attempt to filter it through a few sets of official, honorable,  
and public-spirited scrutinizers.

65 The realms of scientific research are now inextricably  
involved with government funding. Can we fear that the  
humanities might become similarly dependent? If I try to  
think of who in the last century has most brilliantly illumi-  
nated our sense of humanity, which I take to be the end  
70 purpose of the humanities, I think of Freud and Kafka, of  
Proust and Joyce, of Whitman, of Henry James. I wonder  
how many of these brave, strange, stubborn spirits would  
have wanted subsidies from their governments.

How can public-salaried officials not think in terms of  
75 respectability, of social optimism, of broad and uncontro-  
versial appeal? How can legislators, asked to vote tax money  
away, not begin to think of guidelines that insidiously edge  
toward censorship?

80 If government money becomes an increasingly impor-  
tant presence in the financing of the humanities, is there  
a danger, I respectfully ask, of humanists becoming  
politicians?



7. The argument in Passage 1 is supported primarily by
- a theory of how art is created
  - the author's personal experiences
  - examples of renowned artists
  - evidence of the harmful effects of arts funding
  - emotional appeals to uphold the rights of citizens
8. Which is a likely response by the author of Passage 2 to the description of artists as "dangerous" (line 5) in Passage 1?
- Practical concerns rarely prevent artists from speaking out on controversial issues.
  - Artists should not be permitted to undermine the values of their society.
  - Artists will cease taking risks if they come to depend on government money.
  - The future of the arts in the United States depends on whether young artists can continue to shock the public.
  - Experienced artists know better how to excite the public than do young artists.
9. In lines 10-11, Passage 1, the author refers to North Carolina, Iowa, and Utah to
- prove that certain environments support creativity better than others
  - support the argument by mentioning how few exceptions there are to it
  - show that opportunities for artistic success are now widely available
  - suggest that legislators should listen to their constituents
  - offer a parallel between arts funding and democracy
10. The statement in lines 16-18, Passage 1 ("Today . . . artist") is best described as an example of
- an ironic comment
  - an emotional plea
  - a moral pronouncement
  - a definition of a key concept
  - a generalization supported by research
11. The "man in a pinstripe suit" (line 30, Passage 1) is
- a fastidious bureaucrat
  - a character in a novel
  - a famous writer
  - an anonymous critic
  - an imagined benefactor
12. Lines 40-43 ("When . . . for you") suggest that the author of Passage 1 would agree with which of the following observations?
- Those who never succeed value success most.
  - The love of money is the root of all evil.
  - Nothing succeeds like success.
  - Make a virtue of necessity.
  - Time is money.
13. The author of Passage 2 would most likely criticize the author of Passage 1 on the grounds that
- humor detracts from the seriousness of the issue being discussed
  - public funding is often given to artists who do not need it
  - it is invalid to assume that artists can also be teachers
  - taxes will be too high if the government supports the arts
  - public funding is just as likely to inhibit artists as it is to encourage them
14. In line 57, Passage 2, "host" most nearly means
- large number
  - sustaining organism
  - provider
  - proprietor
  - sponsor
15. The question in lines 66-67 suggests that the author of Passage 2 believes that federal funding of scientific research
- encourages deceit
  - undermines autonomy
  - encourages an unhealthy competitiveness
  - develops a superficial sense of loyalty
  - spends public money under false pretenses
16. The author of Passage 2 most likely thinks that the individuals named in lines 70-71 would have
- supported the idea of providing artists with government funding
  - avoided writing about controversial topics if doing so brought them more funding
  - been even more influential if they had received government funding
  - embraced the romantic image of the starving artist
  - refused to submit their creativity to outside control



17. The final sentence of Passage 2 serves to
- (A) emphasize the moral dilemmas that artists face when selling their work
  - (B) indicate why artists are so often in need of financial support
  - (C) suggest that the public should not have to subsidize the art preferred by bureaucrats
  - (D) warn of the likelihood of artistic compromise
  - (E) link arts funding in the United States with other social programs
18. Which of the following is an assumption in Passage 2 that the author of Passage 1 would most likely question?
- (A) Public funding of the arts increases the danger of censorship.
  - (B) Artistic creation should not involve taking financial risks.
  - (C) Artists appreciate financial support more if they earn it after suffering hardships.
  - (D) Administrators of arts funding have higher artistic standards than the general public.
  - (E) Democracy is conducive to artistic self-expression.
19. Which of the following situations would support the position taken in Passage 1 and provide examples contrary to the argument in Passage 2 ?
- I. A federally sponsored photographer displayed an innovative collection of photographs that offended both the sponsor and a large segment of the public.
  - II. The most original works of a certain brilliant composer were those commissioned by kings.
  - III. A theatrical troupe from Harlem achieved prominence by drawing large audiences from its local community.
- (A) I only
  - (B) III only
  - (C) I and II only
  - (D) II and III only
  - (E) I, II, and III

**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

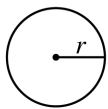
Turn to Section 9 (page 7 of your answer sheet to answer the questions in this section.)

**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 scratchwork.

Notes

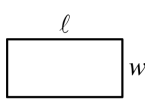
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not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

Reference Information

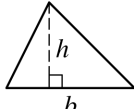


$$A = \pi r^2$$

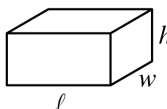
$$C = 2\pi r$$



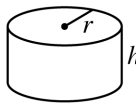
$$A = \ell w$$



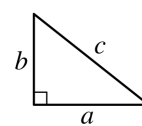
$$A = \frac{1}{2}bh$$



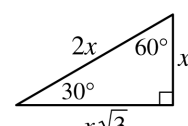
$$V = \ell wh$$



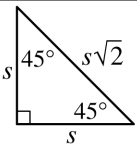
$$V = \pi r^2 h$$



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



Special Right Triangles

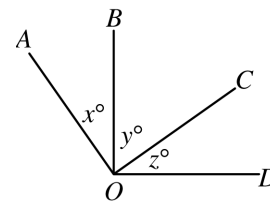


The number of degrees of arc in a circle is 360.

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

1. A community college charges an activity fee of \$4.00 per student and has a student body of 8,200 students. If every student pays the fee, what is the total amount in activity fees collected from the students?

- (A) \$32.80  
 (B) \$328.00  
 (C) \$3,280.00  
 (D) \$32,800.00  
 (E) \$328,000.00



2. In the figure above,  $\overline{OA} \perp \overline{OC}$  and  $\overline{OB} \perp \overline{OD}$ .  
 If  $x = 35$ , what is the value of  $z$ ?

- (A) 55  
 (B) 45  
 (C) 35  
 (D) 30  
 (E) 25

GO ON TO THE NEXT PAGE



## COMMON NAIL SIZES

Size	Length in Inches
2d	1
3d	$1\frac{1}{4}$
4d	$1\frac{1}{2}$
8d	$2\frac{1}{2}$
10d	3

3. Some common nail sizes and their corresponding lengths are shown in the table above. If nail sizes from 2d up to 10d increase by a constant length for each increase of 1d in size, what would be the length, in inches, of a 6d nail?

- (A)  $2\frac{1}{4}$   
 (B)  $2\frac{1}{8}$   
 (C) 2  
 (D)  $1\frac{7}{8}$   
 (E)  $1\frac{3}{4}$

4. In a sequence of numbers, the first number is 2 and each number after the first is 2 more than 3 times the preceding number. What is the fourth number in the sequence?

- (A) 14  
 (B) 17  
 (C) 38  
 (D) 80  
 (E) 242

5. If  $x = 3y$  and  $y = 4z$ , what is  $x$  in terms of  $z$ ?

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



6. If the average (arithmetic mean) of 5 and  $r$  is 7 and the average of 3 and  $s$  is 3, what is the average of  $r$  and  $s$ ?

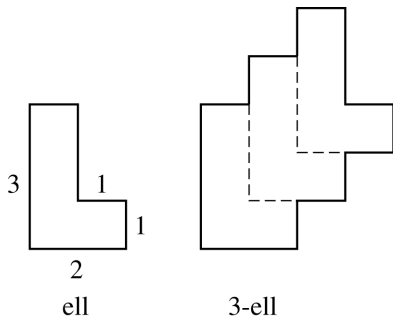
(A) 3  
(B) 5  
(C) 6  
(D) 9  
(E) 12

7. If  $m > 0$ , then  $m^2\left(\frac{m}{m} - \frac{m}{m}\right) =$

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



Questions 8-9 refer to the following figures and information.



The figure on the left is called an ell. The lengths of some of its sides are given, and all the angles are right angles. For any positive integer  $n$ , an  $n$ -ell is the figure formed by positioning  $n$  ells adjacent to each other as shown in the 3-ell on the right.

8. What is the perimeter of the 3-ell?

- (A) 18
- (B) 21
- (C) 24
- (D) 27
- (E) 30

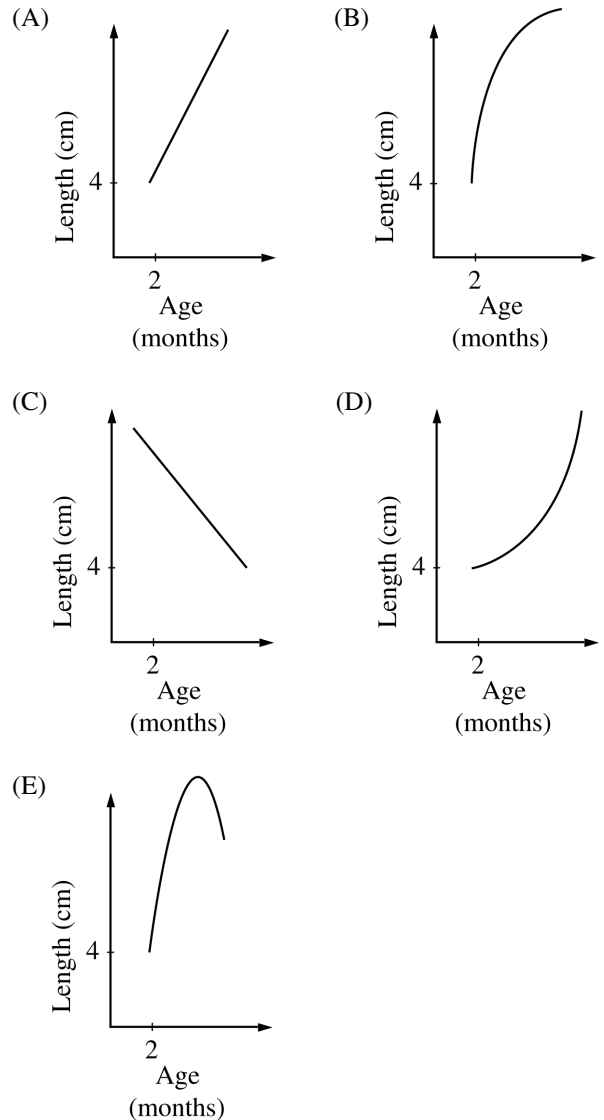
9. The perimeter of an 80-ell is 326 and the perimeter of a 20-ell is 86. What is the perimeter of a 100-ell?

- (A) 406
- (B) 409
- (C) 412
- (D) 416
- (E) 430

LENGTH OF A YOUNG SNAKE

Age (in months)	2	3	4	5	6
Length (in centimeters)	4	9	11	12	12.5

10. Which of the following graphs best represents the information in the table above?







1. Add  $3y$  to  $2x$ .
  2. Multiply the sum by 2.
  3. Subtract  $x - 2y$  from the product.
11. If the steps above are followed in order, which of the following is a simplified expression for the result?
- (A)  $-4y + 3x$   
(B)  $y + 3x$   
(C)  $4y + 5x$   
(D)  $5y + 3x$   
(E)  $8y + 3x$

- 
12. If  $k$  is a positive integer, which of the following is equivalent to  $3^k + 3^k$ ?
- (A)  $2 \cdot 3^k$   
(B)  $3^{2k}$   
(C)  $6^k$   
(D)  $6^{2k}$   
(E)  $9^{2k}$

13. During a one-cent sale, a shopper pays the regular price for a bottle of vegetable oil and pays \$0.01 for a second bottle. If the regular price of the vegetable oil is \$1.89, how much per bottle does the shopper save by buying two bottles at this sale?
- (A) \$0.01  
(B) \$0.94  
(C) \$0.95  
(D) \$0.96  
(E) \$1.89

- 
14. If  $\frac{r+t}{r-t} = \frac{5}{2}$ , what is the value of  $\frac{r}{t}$ ?
- (A)  $-\frac{7}{3}$   
(B)  $-1$   
(C)  $\frac{3}{7}$   
(D)  $1$   
(E)  $\frac{7}{3}$



15. A right circular cylinder has a base of circumference  $8\pi$ . If the volume of the cylinder is  $128\pi$ , what is the height?

- (A) 4
- (B) 8
- (C) 12
- (D) 16
- (E) 32

16. In the  $xy$ -coordinate plane, the graph of  $y = -x^2 + 9$  intersects line  $\ell$  at  $(p, 5)$  and  $(t, -7)$ . What is the least possible value of the slope of  $\ell$ ?

- (A) 6
- (B) 2
- (C)  $-2$
- (D)  $-6$
- (E)  $-10$

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.


**SECTION 10**

Time — 10 minutes

14 Questions

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

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

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

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

EXAMPLE:

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

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

 A  B  C  D  E

1. In their zeal to make beachfront living widely available, developers have overbuilt, thereby they endanger fragile coastlines.
  - (A) overbuilt, thereby they endanger fragile coastlines
  - (B) overbuilt they endanger fragile coastlines as a result
  - (C) overbuilt and thereby have endangered fragile coastlines
  - (D) overbuilt; fragile coastlines endangered thereby
  - (E) overbuilt, the fragile coastlines are endangered by this
2. Hawaii's Haleakala, being more than 10,000 feet high, and the world's largest dormant volcano.
  - (A) Haleakala, being more than 10,000 feet high and
  - (B) Haleakala, more than 10,000 feet high, it is
  - (C) Haleakala which is more than 10,000 feet high, being
  - (D) Haleakala, more than 10,000 feet high, is
  - (E) Haleakala, more than 10,000 feet high; it is
3. I do not blame Leslie for her anger yesterday, being it was her plan and she should have credit for it.
  - (A) yesterday, being it was her plan and she should have credit for it
  - (B) yesterday, being that she should have credit for it when it was her plan
  - (C) yesterday when it was her plan, for which they should give her credit for it
  - (D) yesterday; since she should receive credit, it being her plan
  - (E) yesterday: it was her plan, and she should have received credit for it
4. At the time at which temperatures approach absolute zero, or  $-459.7^{\circ}$  F, metals become highly conductive, and their volume shrinks dramatically.
  - (A) At the time at which temperatures approach
  - (B) When temperatures approach
  - (C) Since temperatures approached
  - (D) At the point temperatures had approached
  - (E) While temperatures approaching
5. Participants in the executive leadership workshop expect a program of outstanding speakers and gaining information about new approaches to management.
  - (A) and gaining information
  - (B) as well as information
  - (C) as well as being informed
  - (D) and also being informed
  - (E) in addition, they expect to gain information



6. One of the unforeseen consequences of the editor's management style is that it leaves so little room for innovation.
- (A) that it leaves so little room for innovation  
(B) that they leave so little room for innovation  
(C) that sufficient room is not left for their innovation  
(D) that innovation has so little room left from it  
(E) to leave so little room for innovation
7. For decades, African American music has inspired musicians throughout the world, including in Russia.
- (A) including in Russia  
(B) including those of Russia  
(C) this includes Russia  
(D) one of which is Russia  
(E) one example being Russia
8. By the end of the eighteenth century, watchmaking technology had greatly improved, and they were standard equipment for military personnel.
- (A) and they were standard equipment for military personnel  
(B) so it was standard equipment for military personnel to have watches  
(C) with watches included in the standard equipment for military personnel  
(D) and watches had become standard equipment for military personnel  
(E) and for military personnel it was standard equipment
9. Nancy and Carlos will represent Central High in the swimming competition, their work in this having been excellent this year.
- (A) competition, their work in this having been excellent this year  
(B) competition, they have done excellent work this year in this  
(C) competition, for this year they have done excellent work in this  
(D) competition, for their swimming has been excellent this year  
(E) competition, their work as swimmers having been excellent this year
10. After 1907, residents of the Omaha Reservation could use the hospital in Walthill, Nebraska, it was established by Dr. Susan LaFlesche Picotte, an Omaha Indian.
- (A) hospital in Walthill, Nebraska, it was established by Dr. Susan LaFlesche Picotte, an Omaha Indian  
(B) hospital; it was in Walthill, Nebraska and established by Dr. Susan LaFlesche Picotte, an Omaha Indian  
(C) hospital that has been established by Dr. Susan LaFlesche Picotte, an Omaha Indian, in Walthill, Nebraska  
(D) Walthill, Nebraska, hospital where an Omaha Indian, Dr. Susan LaFlesche Picotte, established it  
(E) hospital established in Walthill, Nebraska, by Dr. Susan LaFlesche Picotte, an Omaha Indian
11. Eating food that has a high concentration of fat causes essentially the same reaction in the stomach than if you eat too fast.
- (A) than if you eat  
(B) than to eat  
(C) as if one eats  
(D) as eating  
(E) as it does when eating
12. Not one of the students in the advanced chemistry class have passed a single test with a grade better than a C, but the second half of the course will be easier.
- (A) have passed a single test with a grade better than a C  
(B) have managed to pass a single test with better than a C grade  
(C) have passed a single test any better than a grade of C  
(D) has passed having better than a C grade on a single test  
(E) has passed a single test with better than a C grade



13. In neighborhoods throughout the United States, one can encounter hundreds of different rope-jumping games, each with its own rules.
- (A) each with its own rules
  - (B) each having their own rules
  - (C) when they each have their own rules
  - (D) which has its own rules
  - (E) they each have rules of their own
14. A flurry of do-it-yourself books on the market today are inspiring homeowners to do their own repairs.
- (A) are inspiring homeowners to do their own repairs
  - (B) are inspiring to homeowners about their own repairs
  - (C) is inspiring homeowners into doing their own repairing
  - (D) is inspiring homeowners to do their own repairs
  - (E) inspiring homeowners to repair their own homes

**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.**