

SAT I: Reasoning Test

Sunday, May 1996

Section 1 1 1 1 1 1 1

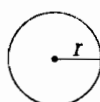
Time—30 Minutes
25 Questions

In this section solve each problem, using any available space on the page for scratchwork. Then decide which is the best of the choices given and fill in the corresponding oval on the answer sheet.

Notes:

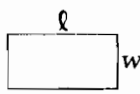
1. The use of a calculator is permitted. All numbers used are real numbers.
2. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

Reference Information

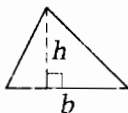


$$A = \pi r^2$$

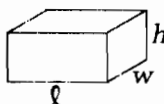
$$C = 2\pi r$$



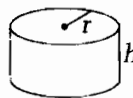
$$A = lw$$



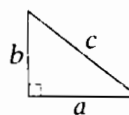
$$A = \frac{1}{2}bh$$



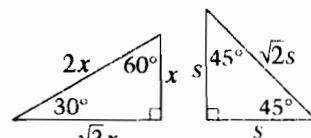
$$V = lwh$$



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



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



Special Right Triangles

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

The measure in degrees of a straight angle is 180.

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

- 1** If an object travels at 2 feet per minute, how many feet does it travel in a half hour?

- (A) 1
- (B) $2\frac{1}{2}$
- (C) 10
- (D) 30
- (E) 60

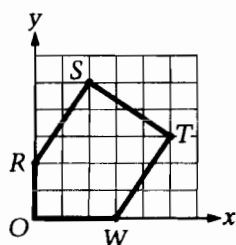
- 2** Mona just bought a book from a bookstore that sells only biographies and novels. Which of the following must be true?

- (A) The book is a novel.
- (B) The book is a biography.
- (C) The book is not a dictionary.
- (D) The book is not a humorous novel.
- (E) The book is not a biography of John Adams.

- 3** Ben spends \$1.95 for lunch at school each day. He wants to estimate the amount he will spend for lunch during the month of May, which has 22 school days. Which of the following will give him the best estimate?

- (A) $\$1.00 \times 20$
- (B) $\$1.50 \times 20$
- (C) $\$2.00 \times 20$
- (D) $\$1.50 \times 25$
- (E) $\$2.00 \times 30$

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4 In the figure above, which two sides of polygon $ORSTW$ have the same slope?

- (A) OR and OW
- (B) OW and ST
- (C) RS and ST
- (D) RS and WT
- (E) ST and WT

5 If n is an even integer greater than 2, what is the next greater even integer in terms of n ?

- (A) $n + 1$
- (B) $n + 2$
- (C) $n + 3$
- (D) $2n$
- (E) n^2

6 A piece of wire x feet in length is cut into exactly 6 pieces, each 2 feet 4 inches in length. What is the value of x ? (1 foot = 12 inches)

- (A) $12\frac{1}{3}$
- (B) $12\frac{1}{2}$
- (C) 13
- (D) $13\frac{1}{2}$
- (E) 14

7 Of the following numbers, which is least?

- (A) $1 + \frac{1}{3}$
- (B) $1 - \frac{1}{3}$
- (C) $\frac{1}{3} - 1$
- (D) $1 \times \frac{1}{3}$
- (E) $1 + \frac{1}{3}$

{2, 5, 6, 7, 10}

8 How many different pairs of unequal numbers can be chosen from the set above so that their sum is greater than 10? (Do not consider a pair such as 5, 2 to be different from 2, 5.)

- (A) 7
- (B) 10
- (C) 14
- (D) 32
- (E) 60

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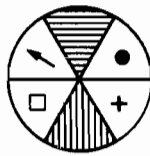
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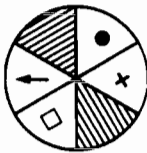
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- 9 In the figure above, the three diameters divide the circle into six equal regions. If the circle is rotated 120° in a clockwise direction in its plane, which of the following represents the resulting circle?

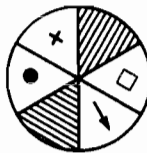
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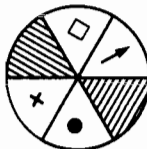
(B)



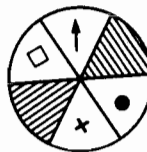
(C)



(D)

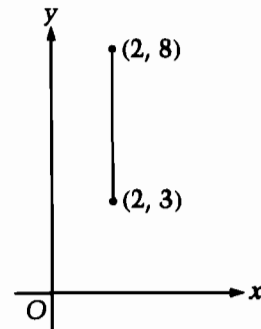


(E)



- 10 From 1 p.m. to 5 p.m. on Monday, a group of photographers will be taking individual pictures of 600 students. If it takes 2 minutes to take each student's picture, how many photographers are needed?

(A) Two
(B) Three
(C) Four
(D) Five
(E) Fifteen



- 11 In the figure above, the line segment joining the points $(2, 3)$ and $(2, 8)$ forms one side of a square. Which of the following could be the coordinates of another vertex of that square?

(A) $(-2, 5)$
(B) $(-2, 3)$
(C) $(5, 2)$
(D) $(7, 2)$
(E) $(7, 8)$

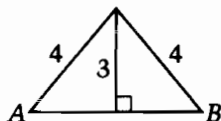
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- 12 Three business partners are to share profits of \$24,000 in the ratio 5 : 4 : 3. What is the amount of the least share?

(A) \$1,200
(B) \$3,000
(C) \$6,000
(D) \$8,000
(E) \$10,000

- 13 If p is a prime number greater than 3, which of the following is NOT a factor of $6p$?

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

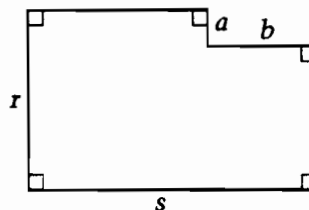


- 14 In the figure above, what is the length of AB ?

(A) 5
(B) 7
(C) $2\sqrt{7}$ (approximately 5.29)
(D) $4\sqrt{2}$ (approximately 5.66)
(E) $4\sqrt{3}$ (approximately 6.93)

- 15 What is the least possible integer for which 20 percent of that integer is greater than 1.2?

(A) 2
(B) 3
(C) 4
(D) 6
(E) 7



- 16 Which of the following is equal to the perimeter of the figure above?

(A) $r + s + a + b$
(B) $2r + s + (a + b)$
(C) $2(r + s) - (a + b)$
(D) $2(r + s) + (a + b)$
(E) $2(r + s)$

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17 If $y = 1 + \frac{1}{x}$ and $x > 1$, then y could equal

- (A) $\frac{1}{7}$
- (B) $\frac{5}{7}$
- (C) $\frac{9}{7}$
- (D) $\frac{15}{7}$
- (E) $\frac{19}{7}$

18 Five distinct points lie in a plane such that 3 of the points are on line ℓ and 3 of the points are on a different line, m . What is the total number of lines that can be drawn so that each line passes through exactly 2 of these 5 points?

- (A) Two
- (B) Four
- (C) Five
- (D) Six
- (E) Ten

Add 3 to x .
Divide this sum by 4.
Subtract 2 from this quotient.

19 Which of the following is the result obtained by performing the operations described above?

- (A) $\frac{x-5}{4}$
- (B) $\frac{x+1}{4}$
- (C) $\frac{x+3}{2}$
- (D) $\frac{3x-8}{4}$
- (E) $\frac{x+1}{2}$

20 If the ratio of q to r is 4 to 5, which of the following could be true?

- (A) $q = 0, r = \frac{4}{5}$
- (B) $q = 2, r = \frac{5}{2}$
- (C) $q = 5, r = 6$
- (D) $q = 15, r = 12$
- (E) $q = 16, r = 25$

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- 21 Which of the following gives the number of revolutions that a tire with diameter x meters will make in traveling a distance of y kilometers without slipping? (1 kilometer = 1,000 meters)

(A) $\frac{1,000y}{\pi x}$
 (B) $\frac{1,000}{\pi xy}$
 (C) $\frac{500}{\pi x}$
 (D) $\frac{y}{1,000\pi x}$
 (E) $\frac{\pi x}{1,000y}$

1, 2, 1, -1, -2, ...

- 22 The first five terms of a sequence are shown above. After the second term, each term can be obtained by subtracting from the previous term the term before that. For example, the third term can be obtained by subtracting the first term from the second term. What is the sum of the first 36 terms of the sequence?

(A) 0
 (B) 4
 (C) 12
 (D) 24
 (E) 30

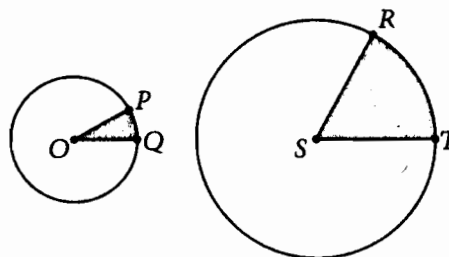
- 23 If $n > 1$ and each of the three integers n , $n + 2$, and $n + 4$ is a prime number, then the set of three such numbers is called a "prime triple." There are how many different prime triples?

(A) None
 (B) One
 (C) Two
 (D) Three
 (E) More than three

- 24 If j and k are integers and $j + k = 2j + 4$, which of the following must be true?

I. j is even.
 II. k is even.
 III. $k - j$ is even.

(A) None
 (B) I only
 (C) II only
 (D) III only
 (E) I, II, and III



- 25 In the figure above, the radius of the circle with center S is twice the radius of the circle with center O and the measure of $\angle RST$ is twice that of $\angle POQ$. If the area of the shaded region of circle O is 3, what is the area of the shaded region of circle S ?

(A) 24
 (B) 12
 (C) 6
 (D) 3
 (E) $\frac{3}{2}$

Section 2

2

2

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Time — 30 Minutes
30 Questions

For each question in this section, select the best answer from among the choices given and fill in the corresponding oval 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:

Medieval kingdoms did not become constitutional republics overnight; on the contrary, the change was ----.

- (A) unpopular
- (B) unexpected
- (C) advantageous
- (D) sufficient
- (E) gradual

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

- 1 The unification of Upper and Lower Egypt around 3000 B.C. acted as a catalyst, ---- a flowering of Egyptian culture.
(A) triggering (B) describing (C) suspending
(D) polarizing (E) symbolizing
- 2 If his works had been regarded merely as those of a fool, he might have met with only ----, not with violent enmity and strict censorship.
(A) brutality (B) loathing (C) rebellion
(D) ridicule (E) execution
- 3 Recent evidence that a special brain cell is critical to memory is so ---- that scientists are ---- their theories of how the brain stores information to include the role of this cell.
(A) pervasive. .reproducing
(B) perplexing. .formulating
(C) obscure. .confirming
(D) extreme. .restoring
(E) compelling. .revising
- 4 The ---- act was ---- even to the perpetrator, who regretted his deed to the end of his life.
(A) vulgar. .unaffected
(B) heinous. .appalling
(C) vengeful. .acceptable
(D) timorous. .intrepid
(E) forgettable. .offensive

- 5 The observation that nurses treating patients with pellagra did not ---- the disease led epidemiologists to question the theory that pellagra is ----.
(A) risk. .deadly
(B) fear. .curable
(C) acknowledge. .common
(D) contract. .contagious
(E) battle. .preventable
- 6 The general view of gorillas as menacing, ferocious King Kongs was not successfully ---- until Dian Fossey's field studies in the 1960's showed gorillas to be peaceable, rather fainthearted creatures, unlikely to ---- humans.
(A) counteracted. .please
(B) enhanced. .murder
(C) verified. .attack
(D) dispelled. .captivate
(E) challenged. .threaten
- 7 The quotation attributing to the mayor the view that funds for police services should be cut was ----; it completely ---- the mayor's position that more police should be hired.
(A) inflammatory. .justified
(B) abbreviated. .curtailed
(C) meticulous. .misstated
(D) egregious. .underscored
(E) spurious. .misrepresented
- 8 A ---- is concerned not with whether a political program is liberal or conservative but with whether it will work.
(A) radical (B) utopian (C) pragmatist
(D) partisan (E) reactionary
- 9 Thomas Jefferson's decision not to ---- lotteries was sanctioned by classical wisdom, which held that, far from being a ---- game, lots were a way of divining the future and of involving the gods in everyday affairs.
(A) expand. .sacred
(B) publicize. .vile
(C) condemn. .debased
(D) legalize. .standardized
(E) restrict. .useful

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Each question below consists of a related pair of words or phrases, followed by five possible answers. Select the answer that is most closely related to the original pair.

Example:

CHUM : FRIEND ::

- (A) enemy : ally
- (B) splinter : wood
- (C) water : bucket
- (D) robin : song
- (E) master : slave

III FLAP : WING ::

- (A) speak : sound
- (B) wave : hand
- (C) whisper : word
- (D) stub : toe
- (E) sing : bird

II POISON : TOXIC ::

- (A) mixture : soluble
- (B) sugar : sweet
- (C) medicine : prescribed
- (D) milk : bottled
- (E) solid : liquid

I DEDUCTION : RATIONAL ::

- (A) hunch : intuitive
- (B) ploy : spontaneous
- (C) maxim : hackneyed
- (D) hypothesis : tested
- (E) daydream : bored

II BEAUTY : AESTHETE ::

- (A) pleasure : hedonist
- (B) emotion : demagogue
- (C) opinion : sympathizer
- (D) seance : medium
- (E) luxury : ascetic

II FLIPPANCY : JOLLITY ::

- (A) recognition : achievement
- (B) practice : expertise
- (C) camaraderie : combativeness
- (D) insolence : pride
- (E) politeness : behavior

I INCANTATION : WORDS ::

- (A) malediction : harm
- (B) oration : formality
- (C) talisman : object
- (D) enchantment : happiness
- (E) divination : future

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Line
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(10)

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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 16-20 are based on the following passage.

The following passage is about Black American fiction and the Romantic literary tradition. The Romance novel is a literary form that took shape during the eighteenth and nineteenth centuries. Different from the sentimental, escapist writing often described as romantic, Romance novels focus on the heroic dimensions of life, using symbolism to express abstract ideas.

During the nineteenth century, the traditional Romance became an important mode of expression for many Black American writers. A frequent characteristic of Romantic writing is the use of historical material; Black writers have used this genre to transform an often harsh historical reality into an imagined world ruled by their own ethical vision. In transforming history into fiction, Romantic writers have given their work a mythic quality that deepens the significance of plot, character, and historical event.

Clotel, a novel written in 1853 by William Wells Brown, is an early example from this romantic tradition. *Clotel*'s heroes are idealized, fighting slavery through superhuman action, and are used to convey a complex political message. For Brown, the Black man or woman was destined to move toward spiritual perfection, but was being blocked by the dehumanizing effects of slavery. The conflict in *Clotel* is both an ongoing political one, between slaves and their owners, and a wider moral conflict between good and evil; the story is placed in both a historical context and the larger context of human ethical progress. The resolution is satisfyingly hopeful—a victory over obstacles.

More than a hundred years after Brown wrote, Black writers like Toni Morrison and David Bradley work in a very different historical context. Yet one of the major themes for these two writers, the investigation of relationships between North American and African culture, is as deeply historical as Brown's concern with slavery. Both Morrison and Bradley address the close relationships between myth and history by writing of people who undertake the archetypal quest for selfhood. Their characters are compelled to confront not only their own personal histories, but their cultural histories as well. Both of these writers also explore this cultural history stylistically, by experimenting with rhetorical devices traditionally identified with both African and Western experience, including the oral narra-

tive and the mythological theme of the journey to the home of one's ancestors.

Reaching into the past has meant that spirituality, religion, and the supernatural play an important role in the work of both of these writers. Yet rather than mythologizing history, as some of their predecessors had done, these writers chose to explore the mythical aspects already present in African American culture. Both emphasize that religion for many contemporary Black Americans can be at the same time a reclamation of African philosophy and a reenvisioning of the Judeo-Christian tradition; religion is for these writers the source of a conviction that knowledge of one's ancestors is crucial to self-knowledge. By developing these ancient themes, Morrison and Bradley have considerably expanded the boundaries of the Romantic tradition in which they have worked.

16 Which of the following titles best summarizes the content of the passage?

- (A) A Return to Romance: The Contemporary Revival of a Nineteenth-Century Tradition
- (B) The Role of Plot and Character in the Black American Literary Tradition
- (C) Oral Narrative and Religion in the Romantic Fiction of Black American Novelists
- (D) Moral Conflict in Literature: Slavery and the Black American Novelist
- (E) History and the Romantic Tradition in Black American Fiction

17 It can be inferred from the passage that by describing the characters in Brown's *Clotel* as "idealized" (line 14), the author means that they

- (A) believe themselves to be more virtuous than they actually are
- (B) are not particularly realistic but represent attitudes admired by Brown
- (C) represent the kind of person Brown would have liked to be
- (D) are as close to being perfectly described as fictional characters can be
- (E) are blind to the real problems that prevent them from succeeding

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2**2****2****2****2****2****2****2**

18 The "quest for selfhood" (line 35) undertaken by Morrison's and Bradley's characters is best described as an effort to

- (A) come closer to the spiritual perfection described in Romantic fiction
- (B) learn to describe their personal experiences through traditional storytelling
- (C) understand themselves in terms of both their personal and their cultural pasts
- (D) investigate the mythical and spiritual characteristics of their predecessors
- (E) assert their own attitudes and ideas, especially when they differ from those of their ancestors

19 By stating that Morrison and Bradley explore history "stylistically" (line 39), the author means that they

- (A) believe that style is the most important element in their fiction
- (B) use a variety of fashionable techniques
- (C) researched their own families before writing about their characters' ancestors
- (D) use traditional forms of expression in writing current fiction
- (E) use words and phrases from ancient languages to make their novels more authentic

20 Which of the following best describes the structure of the author's discussion in this passage?

- (A) Examination of the aspects of Brown's work that led to important later developments in Black Romantic literature
- (B) Description of first the advantages and then the disadvantages of the use of Romance in Black fiction
- (C) Use of early and recent examples to demonstrate both change and continuity in Black Romantic fiction
- (D) Use of comparison to demonstrate that contemporary Black Romantic fiction is superior to that of the nineteenth century
- (E) Discussion of the work of three authors in order to develop a general definition of the Romantic literary genre

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Line
(5)

(10)

(15)

(20)

(25)

(30)

(35)

(40)

Questions 21-30 are based on the following passage.

The following excerpt from a novel focuses on a single photograph of a father and son taken in 1942 by a family friend.

Line
(5) Even without the shadow that partially obscures the child's face, it would be difficult to read much into its full anonymous curves. The sun is directly overhead, so that the cap's brim shadows most of his face. Only the eyebrows, cheeks, and nose catch the sun directly, making them appear touched with the dead white of clown's paint. This, in turn, may lead us to see more sadness in the eyes than is really there, as though they have been baffled witnesses to some violent tableau. The chin is tucked
(10) downward so that the eyes must glance up to greet the camera, giving to the entire figure a quality of uncertainty, of barely contained fear. Even the timorous lip-trembling half-smile contributes to this effect. But perhaps he is only uncomfortable.
(15) The folds in his plaid jacket and trousers suggest they are made of wool, and the cap is certainly of camel's hair. Yet the full-leafed trees and shrubbery visible in the photograph suggest midsummer, and with the sun overhead, the wincing look on the child's round face may be the result of coarse wool chafing his skin. At any rate, he seems uncomfortable and shy, with feet pigeon-toed awkwardly together. The single detail that
(20) argues against this impression is that he has hooked his thumbs into the pockets of his jacket, and his surprisingly long, lean fingers lend the gesture a note of adult confidence, even of swagger. These hands, which will later be much admired,
(25) are thus unconsciously arranged in a posture that will become habitual. There is another photograph, taken a quarter-century later, in which the hands are identically arranged, thumbs hooked into the pockets of a midnight-blue tuxedo jacket. And yet,
(30) taken in its entirety, there is little enough visible in the child's picture to provoke narration. Indeed, the cap, the chubby, boyish face, the sagging jacket, the wrinkled trousers are assembled into an almost anonymous image of a well-fed, modestly well-dressed little boy. Those who knew his son at the
(35) same age would have seen an astonishing similarity to the child who poses here, but the son is not born until nearly two decades after this photograph is made.

(45) "Stand just there, by your father," Juanita says. The boy moves stiffly to the left, never taking his eyes from the camera in her hands. "Closer, now." He inches his left foot out, and brings his right up to join it. Then he ducks his head to avoid the
(50) stabbing rays of the sun, but still keeps his eyes firmly fixed on the camera, as though it is the only presence here besides himself, its twinkling eye his trusty guardian. Suddenly his slight body stiffens as a large hand is placed firmly between
(55) his shoulders. It feels immense, and he thinks it could crush his back as easily as it crumples an empty package of cigarettes. And now his own hands, which had hung loosely at his sides, feel weak and threatened. They will never possess the
(60) strength of the densely muscled, tightly tendoned hand that rests sinisterly on his back. He fears that as he grows they will remain weak and small, never capable of seizing with carefully aligned thumbs the leather-wrapped handle of a golf club,
(65) of grasping the butts of revolvers, the ivory steering wheel of an automobile, the wooden T of lawnmower handles. Yet he cannot be ashamed of them, for they are sturdy enough, capable of holding open the pages of a book, of guiding pencils
(70) and crayons into recognizable approximations of houses and horses and dump trucks. Unsure though he is of their ultimate abilities, the child nonetheless takes premature joy in the work of hands, and cannot be ashamed of his own. Therefore, he brings
(75) them slightly forward, hooking his thumbs into his jacket pocket, and lightly curling his fingers down against the plaid of the fabric. The trembling that began in them when the man's large hand was placed between his shoulders is stilled now.

21 The opening two sentences (lines 1-5) introduce a sense of

- (A) mystery
- (B) malice
- (C) intense emotion
- (D) disillusionment
- (E) youthful innocence

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- 22** The effect of the sentence beginning "But perhaps" (line 15) is to
- (A) introduce the author's change of attitude from criticism of the boy to sympathy
 - (B) lighten the tone by revealing the humor in the situation
 - (C) suggest that the boy's expression is open to interpretation
 - (D) express an opinion that is not supported by the photograph
 - (E) furnish a clue to the author's identity and relationship to the boy
- 23** The description of the clothing in lines 16-22 contributes to a sense of the
- (A) comical nature of the scene
 - (B) family's eccentricity
 - (C) family's extreme poverty
 - (D) boy's independent spirit
 - (E) boy's overall unease
- 24** As used in line 28, "a note" most nearly means
- (A) an observation
 - (B) a brief record
 - (C) an element
 - (D) a message
 - (E) a comment
- 25** In the second paragraph, the father is portrayed as exemplifying
- (A) virile competence
 - (B) sophisticated intellect
 - (C) courageous perseverance
 - (D) unpredictable irrationality
 - (E) paternal generosity
- 26** How does the second paragraph function in relation to the first paragraph?
- (A) It reiterates comments in the first paragraph.
 - (B) It provides clarification of ambiguities in the first paragraph.
 - (C) It functions as an extension of an analogy begun in the first paragraph.
 - (D) It uses information from the first paragraph to make predictions.
 - (E) It provides a more abstract argument than does the first paragraph.
- 27** The author's reference to "his trusty guardian" (line 53) suggests that the
- (A) child is obliged to find comfort in an inanimate object
 - (B) child is fascinated by sparkling images
 - (C) child respects Juanita more than he respects his father
 - (D) father is more reliable than he appears to be
 - (E) father has always considered his child's happiness before his own
- 28** Which aspect of the author's description emphasizes a major contrast in the passage?
- (A) The boy's face
 - (B) The boy's cap
 - (C) The photographer
 - (D) The characters' hands
 - (E) The sun
- 29** The second paragraph suggests that the boy in the photograph apparently regards his father with
- (A) embittered resentment
 - (B) indifferent dismissal
 - (C) cynical suspicion
 - (D) fearful respect
 - (E) proud possessiveness
- 30** Throughout the passage, the primary focus is on
- (A) the implications of the boy's pose in the photograph
 - (B) reasons for the photograph's existence
 - (C) mysteries solved by evidence in the photograph
 - (D) the valuable memories evoked by old photographs
 - (E) speculations about the age of the boy in the photograph

Section 14

Time—30 Minutes
25 Questions

This section contains two types of questions. You have 30 minutes to complete both types. You may use any available space for scratchwork.

Notes:

1. The use of a calculator is permitted. All numbers used are real numbers.
2. 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 noted in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.



$$A = \pi r^2$$

$$C = 2\pi r$$



$$A = lw$$



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



$$V = lwh$$



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



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



Special Right Triangles

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

The measure in degrees of a straight angle is 180.

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

Directions for Quantitative Comparison Questions

Questions 1-15 each consist of two quantities in boxes, one in Column A and one in Column B. You are to compare the two quantities and on the answer sheet fill in oval

- A if the quantity in Column A is greater;
B if the quantity in Column B is greater;
C if the two quantities are equal;
D if the relationship cannot be determined from the information given.

AN E RESPONSE WILL NOT BE SCORED.

Notes:

1. In some questions, information is given about one or both of the quantities to be compared. In such cases, the given information is centered above the two columns and is not boxed.
2. In a given question, a symbol that appears in both columns represents the same thing in Column A as it does in Column B.
3. Letters such as x , n , and k stand for real numbers.

EXAMPLES

Column A

Column B

Answers

11

$$5^2$$

20

☐ A ☐ B ☐ C ☐ D ☐ E

12

$$x$$

30

☐ A ☐ B ☒ C ☐ D ☐ E

13

$$r + 1$$

$$s - 1$$

☐ A ☐ B ☐ C ☒ D ☐ E

150° x°

r and s are integers.

GO ON TO THE NEXT PAGE

SUMMARY DIRECTIONS FOR COMPARISON QUESTIONS

Answer: A if the quantity in Column A is greater;
 B if the quantity in Column B is greater;
 C if the two quantities are equal;
 D if the relationship cannot be determined from the information given.

Column A

Column B

1 10 percent of 500

5

The number 34,759 is to be rounded to the nearest thousand.

2 The digit in the thousands place of the rounded number

The digit in the hundreds place of the rounded number

A club sold a total of 200 candy bars, some at \$0.50 each and the rest at \$1.00 each.

3 The total amount collected from the sale of the \$0.50 candy bars

The total amount collected from the sale of the \$1.00 candy bars

$$a = 2$$

$$c = 3$$

4 $ab + 5$

$a(b + c)$

$$x < 6 + y$$

5 x

y

Column A

Column B

The angles of a quadrilateral have measures 90° , 90° , 100° , and n° .

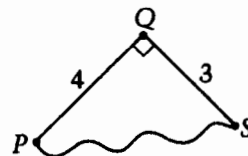
6 n

90

$$d > 1$$

7 $\frac{d}{d-1}$

1



8 The length of the curved path from point P to point S

5

Two sets of vertical angles are formed by two intersecting lines. The sum of the measures of one set of vertical angles is $2x$ and the sum of the measures of the other set is $2y$.

9 x

y

SUMMARY DIRECTIONS FOR COMPARISON QUESTIONS

Answer: A if the quantity in Column A is greater,
 B if the quantity in Column B is greater,
 C if the two quantities are equal,
 D if the relationship cannot be determined from the information given.

Column A

Column B

Questions 10-11 refer to the following definition.

Let $\langle m, n \rangle$ be defined as the set of all integers between m and n , excluding m and n . For example, $\langle 0, 3.5 \rangle = \{1, 2, 3\}$.

x is in $\langle 2, 6 \rangle$.
 y is in $\langle 6, 9 \rangle$.

10

x

y

z is in $\langle \sqrt{5}, \pi \rangle$

11

z

3

All of the members of Club M also belong to Club P . Club P has exactly 20 members.

12

The number of members in Club M

15

$s = a - b$
 $t = b - c$
 $u = c - a$

13

$s + t + u$

0

Column A

Column B

x represents the sum of the first 20 positive integers.

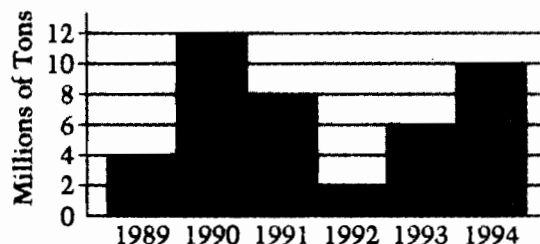
y represents the sum of the first 10 positive integers.

14

$x - y$

100

SOYBEAN PRODUCTION IN STATE Z



Soybean production decreased by x percent from 1990 to 1991 and increased by y percent from 1993 to 1994 in State Z .

15

x

y

GO ON TO THE NEXT PAGE

Directions for Student-Produced Response Questions

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the ovals in the special grid, as shown in the examples below.

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

Write answer in boxes. →

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

← Fraction line

Grid in result. →

Answer: 2.5

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

← Decimal point

Answer: 201
Either position is correct.

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

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

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

- Mark no more than one oval in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the ovals 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 ovals 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 $2\frac{1}{2}$ must be gridded as 2.5 or $5/2$. (If $\frac{21}{2}$ is gridded, it will be interpreted as $\frac{21}{2}$, not $2\frac{1}{2}$.)
- **Decimal Accuracy:** If you obtain a decimal answer, **enter the most accurate value the grid will accommodate.** For example, if you obtain an answer such as $0.6666\dots$, you should record the result as .666 or .667. **Less accurate values such as .66 or .67 are not acceptable.**

Acceptable ways to grid $\frac{2}{3} = .666\dots$

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

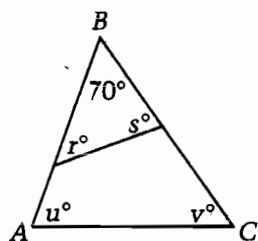
. 6 6 6			
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6

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

16 If $a > 1$ and $a^b a^4 = a^{12}$, what is the value of b ?

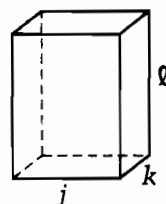
17 If $s = \frac{1}{x}$ and $q = \frac{1}{y}$ and if $x = 2$ and $y = 3$, what is the value of $\frac{1}{s} + \frac{1}{q}$?

- 18 The grand prize for winning a contest is \$10,000. After 28 percent of the prize is deducted for taxes, the winner receives the balance of the prize in annual payouts of equal amounts over a 3-year period. How many dollars will the prizewinner receive each year of the 3 years? (Disregard the \$ sign when gridding your answer.)



- 19 In $\triangle ABC$ above, what is the value of $r + s + u + v$?

- 20 If $x^2 > x^4$ and $x > 0$, what is one possible value for x ?

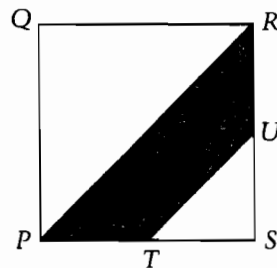


- 21 In the figure above, the area of the base of the rectangular box is 21 and the area of one of the faces is 30. Each of the dimensions j , k , and l is an integer greater than 1. What is the volume of the rectangular box?

GO ON TO THE NEXT PAGE

$$\begin{array}{r} AB \\ + BA \\ \hline CD4 \end{array}$$

- 22 In the correctly worked addition problem above, each letter represents a different nonzero digit. What is one possible value of the two-digit number represented above as AB ?



- 21 In square $PQRS$ above, $QR = 1$, $RU = US$, and $PT = TS$. What is the area of the shaded region?

- 23 If x and y are positive integers, $x + y < 15$, and $x > 5$, what is the greatest possible value of $x - y$?

- 25 A barrel contains only apples and oranges. There are twice as many apples as oranges. The apples are either red or yellow, and 4 times as many apples are red as are yellow. If one piece of fruit is to be drawn at random from the barrel, what is the probability that the piece drawn will be a yellow apple?

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

STOP

Section 5

5

Time — 30 Minutes
36 Questions

For each question in this section, select the best answer from among the choices given and fill in the corresponding oval 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:

Medieval kingdoms did not become constitutional republics overnight; on the contrary, the change was ----.

- (A) unpopular
- (B) unexpected
- (C) advantageous
- (D) sufficient
- (E) gradual

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

- 1 The visitor was of an ---- age: white-haired, but baby-faced, he might have been twenty-five or fifty.
(A) assiduous (B) unalterable (C) indecorous
(D) indeterminate (E) extenuating
- 2 Unfortunately, for North American Indians the arrival of European settlers often meant ---- their lands, their ways of life, and even their very existence.
(A) a renewal of
(B) a respect for
(C) an assault on
(D) a retention of
(E) an idea of
- 3 Different species of mosquito conduct the essential activities of eating, growing, and reproducing in so many ways that no rule of mosquito behavior is without some ----.
(A) result (B) objectivity (C) exception
(D) clarity (E) enforcement
- 4 Even more interesting than the completed masterpiece can be the ---- work of the artist: the first-draft manuscript, the initial pencil sketches, the symphony rehearsal.
(A) rough (B) intense (C) varied
(D) thoughtless (E) atypical
- 5 Oceanographic research has shown that ridges on the ocean floor are not ---- features, but part of a 4,000-mile-long mountain range.
(A) conditional (B) unchanging
(C) observable (D) definable
(E) isolated
- 6 Although Jack and Mary Lynch are often ---- to strangers, they show only ---- to a pack of nearly extinct buffalo wolves, working seven days a week to help save the endangered species.
(A) gracious. .disdain
(B) rude. .exasperation
(C) gruff. .kindness
(D) agreeable. .gentleness
(E) condescending. .hostility
- 7 We need not be ---- about our performance thus far, but neither should we be ----: there is ample room for improvement.
(A) haughty. .generous
(B) lazy. .industrious
(C) apologetic. .smug
(D) opulent. .showy
(E) sympathetic. .crude
- 8 The art collection of the children's museum is quite ----, ranging from furniture to sculpture to finger painting.
(A) imaginary (B) repetitive (C) elusive
(D) eclectic (E) circumscribed
- 9 By subsidizing small farms, the new government is hoping to ---- the flow of people into the cities and ---- farming.
(A) reverse. .incorporate
(B) arrest. .encourage
(C) boost. .initiate
(D) enhance. .regulate
(E) diminish. .prohibit
- 10 Despite Atlanta's large Black community, African American theater companies in that city are anything but ----; in fact, in 1993 there was only one, Jomandi Productions.
(A) legion (B) advantageous (C) bourgeois
(D) nondescript (E) wily

GO ON TO THE NEXT PAGE

Each question below consists of a related pair of words or phrases, followed by five pairs of words or phrases labeled A through E. Select the pair that best expresses a relationship similar to that expressed in the original pair.

Example:

CRUMB : BREAD ::

- (A) ounce : unit
- (B) splinter : wood
- (C) water : bucket
- (D) twine : rope
- (E) cream : butter

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

11 CAMERA : PHOTOGRAPHER ::

- (A) house : architect
- (B) sink : plumber
- (C) studio : painter
- (D) meat : butcher
- (E) drill : dentist

12 FORMAT : NEWSPAPER ::

- (A) binding : book
- (B) design : building
- (C) direction : sign
- (D) market : commodity
- (E) catalogue : library

13 DECIBEL : SOUND ::

- (A) ingredient : food
- (B) ruler : length
- (C) calories : menu
- (D) degree : temperature
- (E) headphones : music

14 ARID : DRY ::

- (A) glacial : cold
- (B) coastal : tidal
- (C) damp : muddy
- (D) snowbound : polar
- (E) shallow : deep

15 FISSION : ENERGY ::

- (A) reaction : response
- (B) distortion : image
- (C) nutrient : growth
- (D) evaporation : liquid
- (E) combustion : heat

16 LOBBYIST : CAUSE ::

- (A) legislator : voter
- (B) clergy : congregation
- (C) advertiser : product
- (D) defendant : verdict
- (E) consumer : goods

17 JOURNAL : ARTICLE ::

- (A) dance : ballet
- (B) magazine : cover
- (C) set : scenery
- (D) anthology : poem
- (E) concert : orchestra

18 EMISSARY : REPRESENT ::

- (A) draftee : enroll
- (B) novice : train
- (C) president : elect
- (D) guard : protect
- (E) comedian : laugh

19 POTENTATE : POWER ::

- (A) broadcaster : news
- (B) virtuoso : skill
- (C) protégé : sponsorship
- (D) maverick : group
- (E) colleague : camaraderie

20 POSTSCRIPT : LETTER ::

- (A) preamble : document
- (B) footnote : reference
- (C) epilogue : play
- (D) signature : name
- (E) index : page

21 IMPIOUS : REVERENCE ::

- (A) profane : behavior
- (B) paranoid : persecution
- (C) contrite : offense
- (D) superficial : depth
- (E) contemptuous : scorn

22 DISINGENUOUS : CRAFTINESS ::

- (A) ecstatic : contentment
- (B) idolatrous : doubt
- (C) narcissistic : appearance
- (D) penitent : wrongdoing
- (E) surreptitious : stealth

23 EXCULPATE : BLAME ::

- (A) extricate : difficulty
- (B) exemplify : illustration
- (C) expedite : process
- (D) divulge : secret
- (E) bewilder : confusion

GO ON TO THE NEXT PAGE

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

Questions 24-36 are based on the following passage.

The following passage is adapted from a book published in 1990. It is about unusual scientific enterprises that to some seemed impossible.

Gerald Feinberg, the Columbia University physicist, once went so far as to declare that "everything possible will eventually be accomplished." He didn't even think it would take very long for this to happen: "I am inclined to put two hundred years as an upper limit for the accomplishment of any possibility that we can imagine today."

Well, that of course left only the impossible as the one thing remaining for daring intellectual adventurers to whittle away at. Feinberg, for one, thought that they'd succeed even here. "Everything will be accomplished that does not violate known fundamental laws of science," he said, "as well as many things that do violate those laws."

So in no small numbers scientists tried to do the impossible. And how understandable this was. For what does the independent and inquiring mind hate more than being told that something just can't be done, pure and simple, by any agency at all, at any time, no matter what. Indeed, the whole concept of the impossible was something of an affront to creativity and advanced intelligence, which was why being told that something was impossible was an unparalleled stimulus for getting all sorts of people to try to accomplish it anyway, as witness all the attempts to build perpetual motion machines, antigravity generators, time-travel vehicles, and all the rest.

Besides, there was always the residual possibility that the naysayers would turn out to be wrong and the yeasayers right, and that one day the latter would reappear to laugh in your face. As one cryonicist* put it, "When you die, you're dead. When I die, I might come back. So who's the dummy?"

It was a point worth considering. How many times in the past had certain things been said to be impossible, only to have it turn out shortly thereafter that the item in question had already been done or soon would be. What greater cliché was there in the history of science than the comic litany of false it-couldn't-be-dones; the infamous case of Auguste Comte saying in 1844 that it would never be known what the stars were made

(45) of, followed in a few years by the spectroscope being applied to starlight to reveal the stars' chemical composition; or the case of Lord Rutherford, the man who discovered the structure of the atom, saying in 1933 that dreams of controlled nuclear fission were "moonshine."

(50) And those weren't even the worst examples. No, the huffiest of all it-couldn't-be-done claims centered on the notion that human beings could actually fly, either at all, or across long distances, or to the moon, the stars, or wherever else. It was as if for unstated reasons human flight was something that couldn't be allowed to happen. "The demonstration that no possible combination of known substances, known forms of machinery and known forms of force, can be united in a practical machine by which man shall fly long distances through the air, seems to the writer as complete as it is possible for the demonstration of any physical fact to be." That was Simon Newcomb, the Johns Hopkins University mathematician and astronomer in 1906, three years after the Wright brothers actually flew.

There had been so many embarrassments of this type that about midcentury Arthur C. Clarke came out with a guideline for avoiding them, which he termed Clarke's Law: "When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong."

(75) Still, one had to admit there were lots of things left that were really and truly impossible, even if it took some ingenuity in coming up with a proper list of examples. Such as: "A camel cannot pass through the eye of a needle." (Well, unless of course it was a very large needle.) Or: "It is impossible for a door to be simultaneously open and closed." (Well, unless of course it was a revolving door.)

Indeed, watertight examples of the really and truly impossible were so exceptionally hard to come by that paradigm cases turned out to be either trivial or absurd. "I know I will never play the piano like Vladimir Horowitz," offered Milton Rothman, a physicist, "no matter how hard I try." Or, from Scott Lankford, a mountaineer: "Everest on roller skates."

(90) No one would bother trying to overcome those impossibilities, but off in the distance loomed some other, more metaphysically profound specimens. They beckoned like the Mount Everests of

- (95) science: antigravity generators, faster-than-light travel, antimatter propulsion, space warps, time machines. There were physicists aplenty who took a look at these peaks and decided they had to climb them.

* Someone who believes in the possibility of freezing the dead and reanimating them at some later date when it is technically feasible to do so.

- 24 As used in line 5, the word "inclined" most nearly means

(A) headed upward
(B) deviated
(C) oblique
(D) prejudiced
(E) disposed

- 25 If the claim made by Feinberg in lines 11-14 should turn out to be true, which of the following must also be true?

(A) Science works by great leaps, not little steps.
(B) Scientists will work harder than they do today.
(C) Scientists' knowledge of fundamental laws is incomplete.
(D) The rate of scientific discovery will decrease.
(E) The definition of the impossible will remain constant.

- 26 The motivation ascribed to "no small numbers" (line 15) of scientists is most nearly analogous to that of

(A) treasure hunters who have recently found a map indicating the exact location of an extremely valuable treasure
(B) underdogs who have been told that they do not have a chance of beating the defending champions
(C) a police detective who works night and day to bring a dangerous criminal to justice
(D) a project director who oversees a project carefully to see that it comes in under budget
(E) a scientist who performs experiments to show that a rival's theory is not supported by the evidence

- 27 In what sense was the concept of the impossible an "affront" (line 21) ?

(A) It implied that previous scientific achievements were not very impressive.
(B) It suggested that the creativity of scientists was limited.
(C) It called into question the value of scientific research.
(D) It implied that scientists work for personal glory rather than for practical advantages.
(E) It blurred the distinction between science and religious belief.

- 28 The devices mentioned in lines 26-28 are cited as examples of

(A) projects that will be completed in the near future
(B) the kinds of things that can be considered only in science fiction
(C) devices that will enhance the well-being of humanity
(D) proof of the irresponsibility of leading scientists
(E) impossible projects that have generated much interest

- 29 The cryonicist's remarks (lines 33-35) depend on the notion that the cryonicist has

(A) everything to gain and nothing to lose
(B) a reasonable chance of remaining healthy for several years
(C) only one chance in life
(D) total confidence in technological progress
(E) greater intellectual powers than others

- 30 The author cites Lord Rutherford's accomplishment (lines 47-48) in order to show that

(A) even the most knowledgeable scientists are often too pessimistic
(B) many failed to see the negative aspects of nuclear technology
(C) Rutherford predicted future events more reliably than did Comte
(D) only those with technical expertise can predict future developments
(E) experts in one field should do research in that field only

GO ON TO THE NEXT PAGE

- 31 It can be inferred from the passage that the author considers Newcomb's comments (lines 57-64) more irresponsible than Comte's (lines 42-45) for which of the following reasons?
- (A) Newcomb spoke on a subject in which he had almost no expertise.
 - (B) Newcomb made his assertions after the basic principle that suggested the contrary had been demonstrated.
 - (C) Newcomb was too willing to listen to those whose point of view was not sufficiently rigorous.
 - (D) Newcomb was disappointed not to be the first to announce the accomplishment of a feat previously thought impossible.
 - (E) Newcomb disagreed with those who had supported his views in the past.
- 32 The assumption in Clarke's Law (lines 71-74) is that
- (A) if an experiment is repeated often enough it will prove or disprove a hypothesis to the extent that the results are identical in every case
 - (B) it is unlikely that those who have devoted their lives to the study of a particular science can imagine possibilities that run counter to their experience
 - (C) scientific discoveries grow not so much out of the lives and careers of individual scientists as out of the spirit of the age
 - (D) scientists who are embroiled in a controversy are less likely to make valid deductions than an impartial observer would be
 - (E) works of science fiction are often useful in predicting the future course of scientific progress
- 33 The parenthetical remarks in lines 79-82 serve to
- (A) indicate why those who disagree with the author are in error
 - (B) support the author's position by citing authorities
 - (C) distance the author from controversial opinions
 - (D) point out problems with certain examples of the impossible
 - (E) prove that many arguments advanced earlier are sound
- 34 The implication of the author's comments in lines 83-86 is that
- (A) scientists who focus on the impossible do not pay enough attention to details
 - (B) a scientist's notions of the impossible reveal the biases of the scientist's particular field
 - (C) in the past, things thought to be impossible have often turned out to be the next major scientific breakthrough
 - (D) the difficulty of finding examples supports the idea that most things thought to be impossible might be achieved
 - (E) people define as impossible things that they themselves find too difficult to be worth attempting
- 35 The reference to Mount Everest in lines 89-90 differs from that in lines 94-95 in that the first reference is an example of
- (A) something easy to do, whereas the second reference is an example of something difficult
 - (B) goals that have been achieved in the past, whereas the second reference is an example of goals to be considered
 - (C) a tall mountain, whereas the second reference is an example of the tallest mountain
 - (D) an old-fashioned goal, whereas the second reference is an example of spiritual inspiration
 - (E) something outlandish, whereas the second reference is an example of a goal worth pursuing
- 36 Unlike the impossibilities mentioned in lines 86-90, those mentioned in lines 95-97 are
- (A) considered worth attempting by some scientists
 - (B) now considered possible by most scientists
 - (C) absurd examples found only in science fiction
 - (D) without practical applications
 - (E) not really impossible, just prohibitively expensive

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

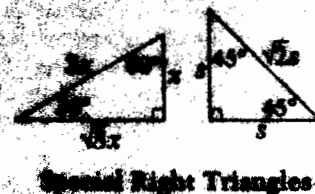
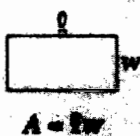
STOP

Time—15 Minutes
10 Questions

In this section solve each problem, using any available space on this page for scratchwork. Then decide which is the best of the choices given and fill in the corresponding oval on the answer sheet.

Notes:

1. The use of a calculator is permitted. All numbers used are real numbers.
2. 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.



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

The measure in degrees of a straight angle is 180.

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

- 1 If $a + 2a + 3a = 3b - 3$ and if $b = 1$, what is the value of a ?
- (A) 0
(B) $\frac{1}{6}$
(C) 1
(D) 3
(E) 6

- 2 The product of two integers is between 102 and 115. Which of the following CANNOT be one of the integers?
- (A) 5
(B) 10
(C) 12
(D) 15
(E) 20

TABLE OF APPROXIMATE CONVERSIONS

Number of Inches	5	10	x
Number of Centimeters	12.7	25.4	50.8

- 2 What is the value of x in the table above?
- (A) 15
(B) 18
(C) 20
(D) 22
(E) 25

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Questions 4-5 refer to the following information.

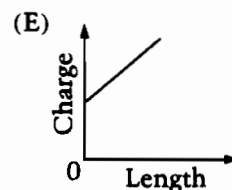
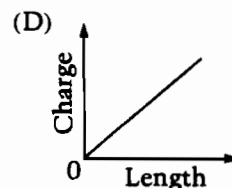
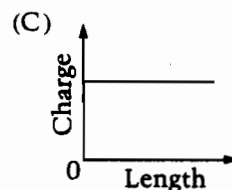
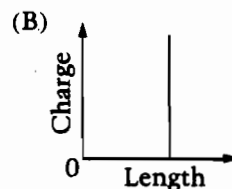
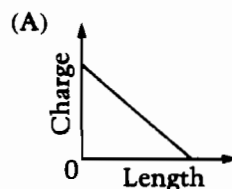
Two companies charge different rates for painting lines on a road.

- Company X charges \$0.50 per foot of line painted and no base price.
- Company Y charges a base price of \$100.00 plus \$0.30 per foot of line painted.

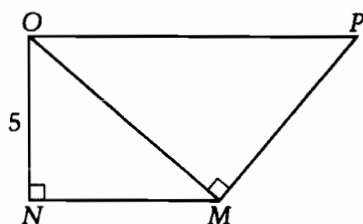
1 Which of the following expressions gives the charge, in dollars, for painting f feet of line if Company X does the job?

- (A) $0.20f$
(B) $0.50f$
(C) $f + 0.50$
(D) $0.20f + 100$
(E) $\frac{f}{0.50}$

2 Which of the following graphs could show the relation between the length of line painted and the charge if Company Y does the job?



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Note: Figure not drawn to scale.

- 6 In the figure above, MNO and OPM are isosceles right triangles. What is the length of OP ?

- (A) 8
- (B) 10
- (C) $5\sqrt{3}$ (approximately 8.66)
- (D) $7\sqrt{2}$ (approximately 9.90)
- (E) $5\sqrt{5}$ (approximately 11.18)

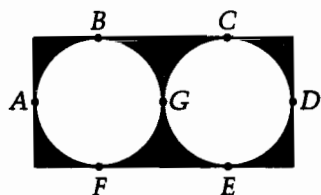
- 7 If the average (arithmetic mean) of 5 consecutive even integers is n , what is the median of these 5 integers?

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

- 8 If a and b are different positive integers and $5a + b = 32$, what is the sum of all possible values of a ?

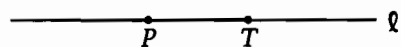
- (A) 6
- (B) 11
- (C) 15
- (D) 18
- (E) 21

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- 9 In the figure above, the circles touch each other and touch the sides of the rectangle at the lettered points shown. The radius of each circle is 1. Of the following, which is the best approximation of the area of the shaded region?

(A) 6
(B) 4
(C) 3
(D) 2
(E) 1



- 10 In the figure above, points P and T lie on line l . How many different points on l are twice as far from point T as from point P ?

(A) None
(B) One
(C) Two
(D) Four
(E) More than four

Section 7

7

Time — 15 Minutes
12 Questions

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

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 1-12 are based on the following passages.

These passages, adapted from works by prominent twentieth-century British authors, are about Joan of Arc (c. 1412-1431), a young Frenchwoman who played a major role in the Hundred Years' War between France and England. She came to prominence when English forces occupied much of French territory.

Passage 1

(5) The report of a supernatural visitant sent by God to save France, which inspired the French, clouded the minds and froze the energies of the English. The sense of awe, and even of fear, robbed them of their assurance. Upon Joan's invocation the spirit of victory changed sides, and the French began an offensive that never rested until the English invaders were driven out of France. She called for an immediate onslaught upon the besiegers, and herself led the storming parties against them. Wounded by an arrow, she plucked it out and returned to the charge. She mounted the scaling-ladders and was hurled half-stunned into the ditch. Prostrate on the ground, she commanded new efforts. "Forward, fellow countrymen!" she cried. "God has delivered them into our hands." One by one the English forts fell and their garrisons were slain. The siege was broken, and Orléans was saved. The English retired in good order, and the Maid¹ prudently restrained the citizens from pursuing them into the open country.

(25) Despite her victories and her services to Charles VII, King of France, the attitude of both the Court and the Church toward Joan eventually began changing. It became clear that she served God rather than the Church,² and France rather than one particular political interest. Indeed, the whole conception of France seems to have sprung and radiated from her. Thus, the powerful particularist interests which had hitherto supported her were estranged.

Joan was captured by the Burgundians, a rival

French faction of Orléans, and sold to the rejoicing English for a moderate sum. For a whole year her fate hung in the balance, while careless, ungrateful Charles lifted not a finger to save her. There is no record of any ransom being offered. History, however, has recorded the comment of an English soldier who witnessed her death at the stake. "We are lost," he said. "We have burnt a saint." All this proved true. Joan of Arc perished on May 29, 1431, and thereafter the tides of war flowed remorselessly against England.

Joan was a being so uplifted from the ordinary run of humankind that she finds no equal in a thousand years. The records of her trial present us with facts alive today through all the mists of time. Out of her own mouth can she be judged in each generation. She embodied the natural goodness and valour of the human race in unexampled perfection. Unconquerable courage, infinite compassion, the virtue of the simple, the wisdom of the just, shone forth in her. She glorifies as she freed the soil from which she sprang. All soldiers should read her story and ponder on the words and deeds of the true warrior, who in one single year, though untaught in technical arts, reveals in every situation the key of victory.

¹ Joan of Arc was known as the Maid of Orléans.

² The Roman Catholic church prior to the Reformation of the sixteenth century

Passage 2

Joan of Arc, a village girl from the Vosges, was born about 1412; burnt for heresy, witchcraft, and sorcery in 1431; but finally declared a saint by the Roman Catholic church in 1920. She is the most notable Warrior Saint in the Christian calendar, and the most unusual fish among the eccentric worthies of the Middle Ages. She was the pioneer of rational dressing for women, and dressed and fought and lived as men did.

Because she contrived to assert herself in all

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- these ways with such force that she was famous throughout western Europe before she was out of her teens (indeed she never got out of them), it is hardly surprising that she was judicially burnt, ostensibly for a number of capital crimes that we no longer punish as such, but essentially for what we call unwomanly and insufferable presumption.
- (75) At eighteen Joan's pretensions were beyond those of the proudest pope or the haughtiest emperor. She claimed to be the ambassador and plenipotentiary³ of God. She patronized her own king and summoned the English king to repentance and obedience to her commands. She lectured, talked down, and overruled statesmen and prelates. She pooh-poohed the plans of generals, leading their troops to victory on plans of her own. She had an unbounded and quite unconcealed contempt for official opinion, judgment, and authority. Had she been a sage and monarch, her pretensions and proceedings would have been trying to the official mind. As her actual condition was pure upstart, there were only two opinions about her. One was that she was miraculous: the other, that she was unbearable.

³One who is given full power to act

1 Lines 10-16 portray Joan as

- (A) rebellious
- (B) courageous
- (C) compassionate
- (D) desperate
- (E) fair

2 The word "retired" in line 18 most nearly means

- (A) discarded
- (B) recalled
- (C) retreated
- (D) slept peacefully
- (E) ceased working

3 The sentence beginning "It became clear" (lines 24-26) indicates that Joan

- (A) was more interested in military affairs than in religious or political ones
- (B) preferred fighting for the underdog and lost interest once her side was winning
- (C) had no particular loyalties, only vague and abstract ideas
- (D) was devoted to God and country rather than to any religious or political institutions
- (E) fought for religious reasons that had nothing to do with her allegiance to Charles VII

4 The statement by the English soldier in lines 38-39 serves primarily to

- (A) explain the valorous behavior of the English in battle
- (B) exemplify the awe Joan inspired in the English soldiers
- (C) illustrate the affection the English really felt for Joan
- (D) indicate the religious conviction behind the English cause
- (E) provide the justification of Joan's later sainthood

5 The phrase "technical arts" (line 56) refers to

- (A) military craft
- (B) mechanical skills
- (C) formal schooling
- (D) practical affairs
- (E) scientific knowledge

6 Which of the following best describes the approach of Passage 1?

- (A) Straightforward, factual narration
- (B) Analysis of a historical theory
- (C) Comparison and contrast
- (D) Colorful, dramatic description
- (E) Criticism couched in sarcasm

7 Passage 2 views Joan's victories as stemming from her

- (A) saintly behavior toward friend and foe alike
- (B) natural goodness and essential simplicity
- (C) threats to resort to witchcraft to frighten the enemy
- (D) ability to command the respect of kings
- (E) strength of personality and determination

8 The phrase "her actual condition was pure upstart" in line 88 indicates that Joan

- (A) behaved spontaneously and optimistically
- (B) defied conventional strategies of warfare
- (C) was unaware of what was expected of her
- (D) was not a member of the elite
- (E) used illegal means to achieve her ends

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- 9** Both passages discuss which of the following regarding Joan?
- (A) Her moral and ethical philosophy
 - (B) Her military background and training
 - (C) Her relationship to the Church and to the state
 - (D) The effect of her death on the outcome of the war
 - (E) The views that English subjects had of her

- 10** Which of the following questions is NOT explicitly answered by either passage?
- (A) What was Joan charged with?
 - (B) Why did it take so long for Joan to be honored with sainthood?
 - (C) Where did Joan come from?
 - (D) What part did Joan personally play in the battle between the English and the French?
 - (E) How valuable was Joan to her country?

- 11** Both passages agree that Joan met with resistance primarily because of her
- (A) attempt to undermine the Church and its teachings
 - (B) headstrong behavior and unwillingness to compromise
 - (C) petty squabbling with officials
 - (D) inability to continue to win military victories
 - (E) refusal to accept the typical female role of her time

- 12** Both passages suggest which of the following about the French and English monarchies?
- (A) Both monarchies felt threatened by the power that Joan was able to command.
 - (B) The two monarchies were unable to settle their differences because of Joan's influence.
 - (C) Both monarchies were torn by internal strife.
 - (D) The English monarchy was more intent on waging war than was the French monarchy.
 - (E) Religion played a more significant role in the French monarchy than in that of the English.

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

SAT I: Reasoning Test Answer Key

Sunday, May 1996

VERB

MATHEMATICAL

Section 2	Section 5	Section 7	Section 1	Section 3	Section 6
Five-choice Questions	Five-choice Questions	Five-choice Questions	Five-choice Questions	Four-choice Questions	Five-choice Questions
COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.	COR. DIFF. ANS. LEV.
1. A 2	1. D 2	1. B 1	1. E 1	1. A 1	1. A 1
2. D 2	2. C 2	2. C 1	2. C 1	2. A 2	2. C 2
3. E 2	3. C 2	3. D 1	3. C 1	3. D 2	3. E 3
4. B 1	4. A 3	4. B 3	4. D 1	4. B 3	4. B 1
5. D 3	5. E 2	5. A 2	5. B 2	5. D 3	5. E 3
6. E 3	6. C 2	6. D 3	6. E 2	6. B 3	6. B 3
7. E 4	7. C 4	7. E 2	7. C 1	7. A 2	7. C 3
8. C 4	8. D 4	8. D 5	8. A 2	8. A 3	8. E 3
9. C 5	9. B 5	9. C 4	9. D 3	9. D 4	9. D 3
10. B 1	10. A 5	10. B 3	10. D 2	10. B 3	10. C 5
11. B 2	11. E 1	11. B 4	11. E 3	11. C 5	
12. A 3	12. B 1	12. A 3	12. C 3	12. D 4	
13. A 5	13. D 2		13. A 3	13. C 2	
14. D 5	14. A 3		14. C 3	14. A 3	no. correct
15. C 5	15. E 3		15. E 3	15. B 5	
16. E 2	16. C 3	no. correct	16. E 5		
17. B 3	17. D 4		17. C 4		
18. C 2	18. D 3		18. B 4		no. incorrect
19. D 4	19. B 3		19. A 4	no. correct	
20. C 4	20. C 4	no. incorrect	20. B 4		
21. A 3	21. D 5		21. A 4		
22. C 3	22. E 5		22. A 3		
23. E 3	23. A 5		23. B 5	no. incorrect	
24. C 3	24. E 5		24. D 5		
25. A 5	25. C 3		25. A 5		
26. B 4	26. B 3				
27. A 3	27. B 3				
28. D 3	28. E 3				
29. D 3	29. A 3		no. correct		
30. A 3	30. A 2				
	31. B 3				
	32. B 4				
	33. D 3		no. incorrect		
no. correct	34. D 5				
	35. E 3				
	36. A 3				
no. incorrect					
	no. correct				
	no. incorrect				
</					

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

Score Conversion Table
SAT I: Reasoning Test
Sunday, May 1996
Recentered Scale

Raw Score	Verbal Scaled Score	Math Scaled Score	Raw Score	Verbal Scaled Score	Math Scaled Score
78	800		37	520	580
77	800		36	510	570
76	800		35	510	560
75	800		34	500	550
74	800		33	490	550
73	800		32	490	540
72	780		31	480	530
71	770		30	480	530
70	750		29	470	520
69	740		28	460	510
68	730		27	460	510
67	720		26	450	500
66	710		25	450	490
65	700		24	440	490
64	690		23	430	480
63	680		22	430	470
62	670		21	420	460
61	670		20	410	460
60	660	800	19	410	450
59	650	800	18	400	440
58	640	780	17	390	430
57	640	760	16	390	430
56	630	740	15	380	420
55	620	730	14	370	410
54	620	720	13	360	400
53	610	710	12	360	390
52	600	700	11	350	380
51	600	690	10	340	370
50	590	680	9	330	360
49	590	670	8	320	350
48	580	660	7	310	340
47	570	650	6	300	330
46	570	640	5	290	320
45	560	640	4	280	310
44	560	630	3	270	290
43	550	620	2	250	280
42	550	610	1	240	270
41	540	600	0	220	250
40	530	600	-1	200	240
39	530	590	-2	200	220
38	520	580	-3	200	200
			and below		

This table is for use only with this test.