SECTION 9
Time — 20 minutes
16 Questions

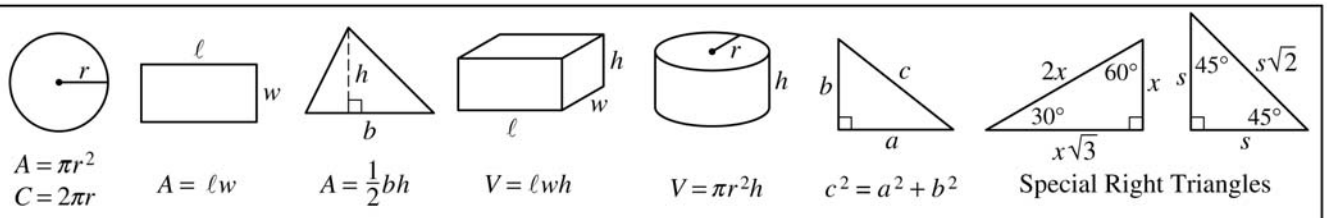
Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.

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

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

Reference Information

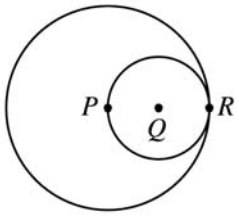


$A = \pi r^2$, $C = 2\pi r$ | $A = \ell w$ | $A = \frac{1}{2}bh$ | $V = \ell wh$ | $V = \pi r^2 h$ | $c^2 = a^2 + b^2$ | Special Right Triangles

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. If $\frac{1}{3}y + 9 = 0$, then $y =$

(A) –27
(B) –9
(C) –3
(D) 3
(E) 27



2. In the figure above, P, Q, and R lie on the same line. P is the center of the larger circle, and Q is the center of the smaller circle. If the radius of the larger circle is 4, what is the radius of the smaller circle?

(A) 1
(B) 2
(C) 4
(D) 8
(E) 16

GO ON TO THE NEXT PAGE

3. Roy planted corn on $\frac{1}{5}$ of his land. If he planted 45 acres of corn, how many acres of land does he have?

(A) 90

(B) $112\frac{1}{2}$

(C) 135

(D) 225

(E) $337\frac{1}{2}$

6, 10, 18, 34, 66

4. The first number in the list above is 6. Which of the following gives a rule for finding each successive number in the list?

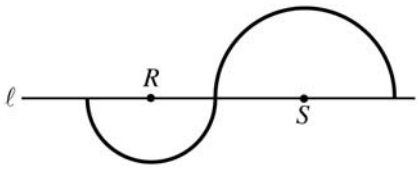
(A) Add 4 to the preceding number.

(B) Take $\frac{1}{2}$ of the preceding number and then add 7 to that result.

(C) Double the preceding number and then subtract 2 from that result.

(D) Subtract 2 from the preceding number and then double that result.

(E) Triple the preceding number and then subtract 8 from that result.



5. The two semicircles in the figure above have centers R and S, respectively. If $RS = 12$, what is the total length of the darkened curve?

(A) 8π

(B) 9π

(C) 12π

(D) 15π

(E) 16π

6. If h and k are positive numbers and $h + k = 7$, then $\frac{7-k}{h} =$

(A) 1

(B) 0

(C) -1

(D) h

(E) $k - 1$

Country	Total Population	Population Density
A	6,500,000 people	600 people per square mile
B	7,600,000 people	400 people per square mile

7. The table above shows the populations of two countries and their population densities. The number of square miles in the area of Country B is approximately how much greater than the number of square miles in the area of Country A ?

(A) 200

(B) 3,600

(C) 5,000

(D) 8,000

(E) 905,000,000

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8. If $x^2 = x + 6$, which of the following must be true?

(A) $x = 6$

(B) $x < 3$

(C) $x > 0$

(D) $x^2 < x$

(E) $x^2 > x$

GO ON TO THE NEXT PAGE

9. Let the function f be defined by $f(x) = 5x - 2a$, where a is a constant. If $f(10) + f(5) = 55$, what is the value of a ?

(A) -5
(B) 0
(C) 5
(D) 10
(E) 20

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10. A number is called "even-odd" if it is halfway between an even integer and an odd integer. If x is an even-odd number, which of the following must be true?

I. $2x$ is an integer.
II. $2x$ is even-odd.
III. x is halfway between two even integers.

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

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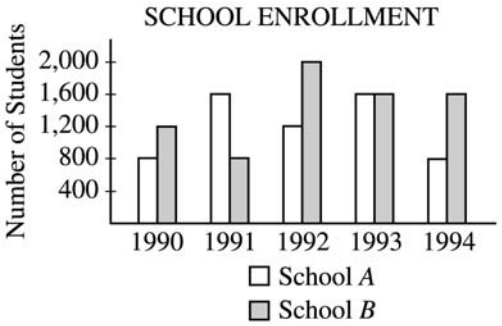
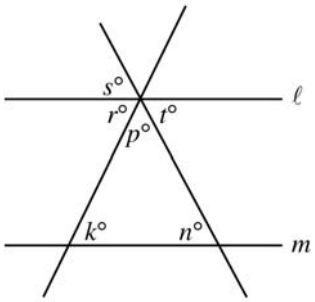
11. If m is a positive integer, which of the following is NOT equal to $\left(2^4\right)^m$?

(A) 2^{4m}
(B) 4^{2m}
(C) $2^m\left(2^{3m}\right)$
(D) $4^m\left(2^m\right)$
(E) 16^m



12. According to the graph above, in which year was the ratio of the number of students enrolled at School B to the number of students enrolled at School A the greatest?

(A) 1990
(B) 1991
(C) 1992
(D) 1993
(E) 1994



13. In the figure above, $\ell \parallel m$. Which of the following must equal 180 ?

(A) $k + n + r$
(B) $k + p + s$
(C) $n + p + s$
(D) $n + p + t$
(E) $r + s + t$

GO ON TO THE NEXT PAGE

14. How many different ordered pairs (x, y) are there such that x is an even integer, where $4 \le x \le 10$, and y is an integer, where $4 < y < 10$?

(A) 8
(B) 12
(C) 20
(D) 30
(E) 36

$$n(t) = 500(0.81)^t$$

15. The function above can be used to model the population of a certain endangered species of animal. If $n(t)$ gives the number of the species living t decades after the year 1900, which of the following is true about the population of the species from 1900 to 1920 ?

(A) It increased by about 1,000.
(B) It increased by about 320.
(C) It decreased by about 180.
(D) It decreased by about 320.
(E) It decreased by about 1,000.

16. A sphere of radius r inside a cube touches each one of the six sides of the cube. What is the volume of the cube, in terms of r ?

(A) r^3
(B) $2r^3$
(C) $4r^3$
(D) $\frac{4}{3}\pi r^3$
(E) $8r^3$

S T O P

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

Correct Answers and Difficulty Levels

Critical Reading

Section 4

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

Number correct

Number incorrect

Section 7

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

Number correct

Number incorrect

Section 8

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

Number correct

Number incorrect

Math

Section 2

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

Number correct

Number incorrect

Section 6

Multiple-Choice Questions

	COR. ANS.	DIFF. LEV.
1.	A	1
2.	C	1
3.	B	2
4.	B	2
5.	A	3
6.	E	5
7.	E	4
8.	A	4

Number correct

Number incorrect

Student-Produced Response Questions

	COR. ANS.	DIFF. LEV.
9.	12	1
10.	2	2
11.	120 < x < 125	2
12.	2035	3
13.	5	3
14.	89	3
15.	13/2 or 6.5	4
16.	5/9, .555 or .556	4
17.	700	5
18.	120	4

Number correct (9-18)

Section 9

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

Number correct

Number incorrect

Writing

Section 5

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

Number correct

Number incorrect

Section 10

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

Number correct

Number incorrect

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

SAT Score Conversion Table

Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score*	Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score*
67	800			31	510	560	54
66	800			30	500	550	54
65	800			29	500	540	53
64	780			28	490	530	52
63	760			27	480	530	51
62	750			26	480	520	50
61	730			25	470	510	49
60	720			24	460	500	48
59	710			23	460	490	47
58	700			22	450	480	47
57	690			21	450	470	46
56	680			20	440	460	45
55	670			19	430	450	44
54	660	800		18	430	440	43
53	650	800		17	420	430	42
52	640	780		16	410	420	41
51	640	760		15	410	420	41
50	630	740		14	400	410	40
49	620	730	80	13	390	400	39
48	610	720	78	12	380	390	38
47	610	710	75	11	380	380	37
46	600	700	73	10	370	370	36
45	590	690	71	9	360	360	35
44	590	680	69	8	350	350	34
43	580	670	67	7	340	330	33
42	580	660	66	6	330	320	32
41	570	650	65	5	320	310	31
40	560	640	64	4	310	290	30
39	560	630	62	3	300	280	28
38	550	620	61	2	280	260	27
37	540	620	60	1	270	240	25
36	540	610	59	0	250	210	24
35	530	600	58	-1	230	200	22
34	530	590	57	-2	210	200	20
33	520	580	56	-3	200	200	20
32	510	570	55	and below			

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

*The writing multiple-choice score is reported on a 20-80 scale. Use the table on the following page for the writing composite scaled score.