SECTION 3
Time- 25 minutes
20 Questions

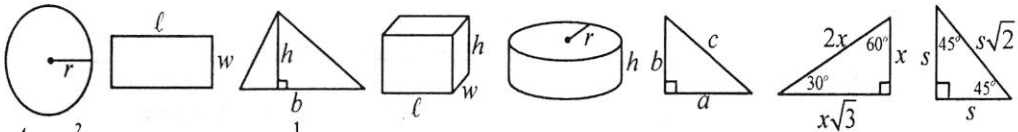
Turn to Section 3 (Page 1) of your answer sheet to answer the questions in this section.

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 figure lie in a plane unless other indicated.
4. Unless otherwise specified, the domain of any function f is assumed to be 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 numbers of degrees of arc in a circle is 360°.

The sum of the measures in degrees of the angles is 180°.

1. If p pencils cost d dollars, x pencils cost how many dollars?

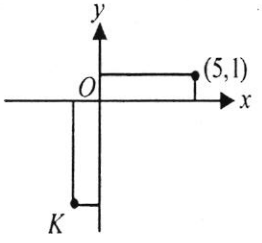
(A) $\frac{dp}{x}$

(B) $\frac{x+d}{p}$

(C) $\frac{x+p}{d}$

(D) $\frac{xp}{d}$

(E) $\frac{dx}{p}$



2. If the two rectangles in the figure are identical, which of the following are the coordinates of point K ?

(A) $(-5,1)$

(B) $(-5,5)$

(C) $(-1,1)$

(D) $(-1,-5)$

(E) $(-5,-1)$

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3. If p percent of 40 percent of 1000 is k, what is p in terms of k?

(A) $400k$
(B) $\frac{k}{4}$
(C) $\frac{40}{k}$
(D) $40k$
(E) $\frac{400}{k}$

$A = \{2, 4, 6\}$
$B = \{1, 2, 3, 4\}$

4. Set A and B are shown above. If a is a member of set A and b is a member of set B, how many different values are possible for ab?

(A) 6
(B) 8
(C) 10
(D) 12
(E) 14

5. If $-1 \leq p \leq 1$, and $-3 \leq q \leq -2$, and $r = (p-q)^2$, what is the smallest possible value of r?

(A) 0
(B) 1
(C) 4
(D) 9
(E) 16

6. If a and b are integers and $a^2 - b^2 = 16$, which of the following cannot be a value of a?

(A) –5
(B) –4
(C) 0
(D) 4
(E) 5

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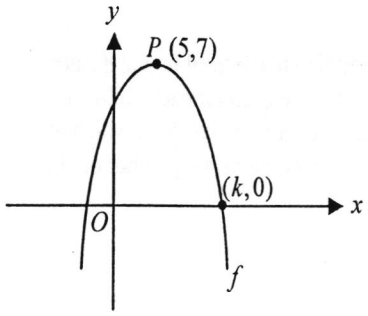

Note: Figure not drawn to scale.

7. The figure above shows the graph of $f(x) = a(x-5)^2 + 7$. Which of the following could be a possible value of k?

(A) 7
(B) 8
(C) 9
(D) 10
(E) 11

8. If $\frac{m+m}{m \times m} = \frac{1}{5}$, which of the following must be true?

I. $m = 0$
II. $m = 5$
III. $m = 10$

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

Questions 9-10 refer to the following definition.

Let $\otimes$ be defined by $a \otimes b = a + 2b + 4ab$ for all numbers a and b.

9. If $5 \otimes k = 93$, what is the value of k?

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

10. For what value of x is $x \otimes y = x$ could be true?

(A) -1
(B) $-\frac{1}{2}$
(C) 0
(D) $\frac{1}{2}$
(E) 1

11. The weight of a box of apples ranges from 1.75 pounds to 2.25 pounds. If p is the weight, in pounds, of the box, which of the following must be true?

(A) $|p| \leq 2$
(B) $|p-2| \geq 0.25$
(C) $|p+2| \leq 0.25$
(D) $|p-2| \leq 0.25$
(E) $|p-1.75| \leq 0.25$

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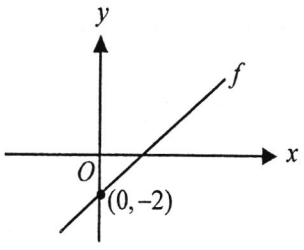

x	$f(x)$
–1	–5
0	a
5	b

12. The table above shows the coordinates of some points on the function f graphed in the xy-coordinate plane. Which of the following is the value of b?

(A) 5
(B) 10
(C) 13
(D) 15
(E) 20

13. There are 3 Republicans and 2 Democrats on a Senate committee. If a 3-person subcommittee is to be formed from this committee, what is the probability of selecting two Republicans and one Democrat?

(A) $\frac{1}{20}$
(B) $\frac{3}{20}$
(C) $\frac{3}{10}$
(D) $\frac{3}{5}$
(E) $\frac{2}{3}$

14. Admission to the local movie theater for a group of 12 people is \$3 for each child and \$7 for each adult. If the group pays \$64, which of the following could be the number of children in the group?

(A) 4
(B) 5
(C) 6
(D) 7
(E) 8

15. When two people shake hands with one another, that counts as one handshake. Every person in a room shakes hands with each other person in the room exactly once. If there are total of 15 handshakes, which of following could be the number of people in the room?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

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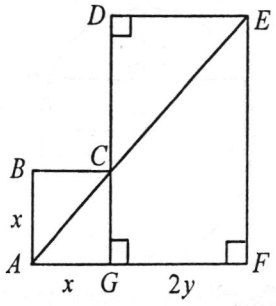
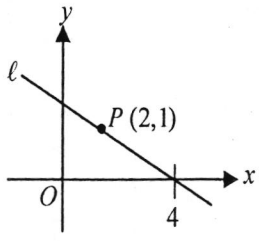


Note: Figure not drawn to scale.

16. In the figure above, the length of $\overline{AB}$, a side of the square, is x and the length of $\overline{FG}$ is $2y$. Which of the following represents the area of the figure $ABCDEFG$?

(A) $x^2 + xy$
(B) $x^2 + 4y^2$
(C) $x^2 + xy + 4y^2$
(D) $(x+2y)^2$
(E) $x^2 + 2xy + 4y^2$



Note: Figure not drawn to scale.

17. The figure above shows line ℓ in the xy-coordinate plane. Line m (not shown) has the equation $y = ax + b$, where a and b are constants. If line m is perpendicular to line ℓ, and passes through the point P, which of the following must be true?

(A) $ab < 0$
(B) $a < 0$
(C) $b > 0$
(D) $b = 0$
(E) $ab > 0$

18. If $(x + y)(x - y) = 0$, which of the following must be true?

(A) $x = 0$ and $y = 0$
(B) $x = y$
(C) $x = -y$
(D) $x^3 = y^3$
(E) $x^2 = y^2$

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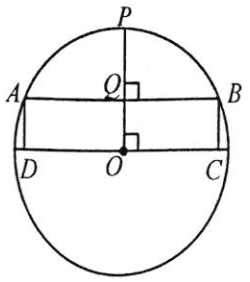
MATH TEST RESULTS

Scores	Number of Students
100	2
90	4
80	6
70	n
60	5
50	1

19. The table above shows the number of students and the scores on a math test. If the median of the test is 75, which of the following could be the value of n?

(A) 8
(B) 7
(C) 6
(D) 5
(E) 4



Note: Figure not drawn to scale.

20. In the figure above, the area of $ABCD$ is 64, and $AQ = 2AD$. What is the area of the circle?

(A) 52π
(B) 60π
(C) 80π
(D) 84π
(E) 90π

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.