SECTION 7
Time – 20 minutes
16 Questions

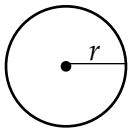
Turn to Section 7 of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

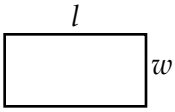
Notes

1. The use of 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 possibly 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.

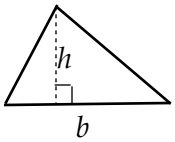
Reference Information



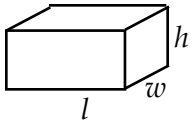
$A = \pi \cdot r^2$
$C = 2 \cdot \pi \cdot r$



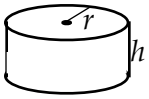
$A = l \cdot w$



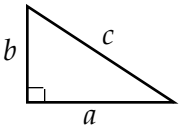
$A = \frac{1}{2} b \cdot h$



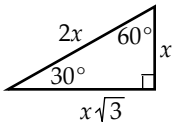
$V = l \cdot w \cdot h$

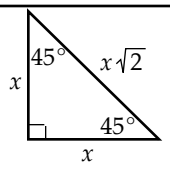


$V = \pi \cdot r^2 \cdot h$



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





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 is the equation for the following statement...

   ...the square root of $5x$ is equal to the square root of y plus the square of x.

   (A) $5x^2 = \sqrt{y + x}$
   (B) $(5x)^2 = (y + x)^2$
   (C) $5x = y^2 + x^2$
   (D) $\sqrt{5x} = y^2 + \sqrt{x}$
   (E) $\sqrt{5x} = \sqrt{y} + x^2$

2. Jack has a cell phone that can operate within a range of 500 miles from the cell tower. Jack takes his cell phone and travels 300 miles due east from the cell tower. What is the maximum number of miles Jack can travel due north and still have cellular reception?

   (A) 100 miles
   (B) 200 miles
   (C) 300 miles
   (D) 400 miles
   (E) 500 miles

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3. If $6(x + 3) = 54$, what is the value of x ?

(A) $\frac{51}{6}$

(B) $\frac{57}{6}$

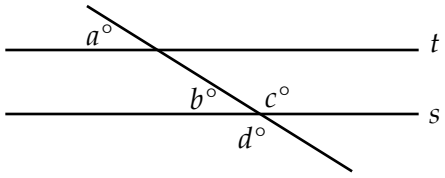
(C) 6

(D) 8

(E) 12

4. Doug wants to grow a plant in a pot over the summer. If there are 4 different types of plants to choose from and 6 different types of pots to choose from, how many combinations of plants and pots are there?

(A) 8
(B) 10
(C) 12
(D) 16
(E) 24



5. In the figure above, line t and line s are parallel. If $a = 30$, what is the value of $b + c + d$?

(A) 210
(B) 240
(C) 270
(D) 300
(E) 330

6. In the xy-coordinate plane, line l is perpendicular to line m. If the equation of line l is $y = 4$, Which of the following is a possible equation for line m ?

(A) $y = 4$
(B) $x = 4$
(C) $y = 4x$
(D) $y = 4x - 5$
(E) $y - 4 = x + 5$

7. If $\frac{a^2}{12} = \frac{3a^2}{4x}$ and $a \neq 0$, what is the value of x ?

(A) 9

(B) 6

(C) 3

(D) $\frac{1}{3}$

(E) $\frac{1}{9}$

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8. A bag contains green marbles, purple marbles, and red marbles. The probability of randomly selecting a green marble from the bag is 1:3. The probability of randomly selecting a purple marble is 1:6. If there are 24 total red marbles in the bag, how many marbles are in the bag?

(A) 32
(B) 36
(C) 42
(D) 48
(E) 56

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9. The total daily cost C, in dollars, to produce x gadgets is given by the equation $C(x) = 23x - (7x + b)$, where b is a constant. If 150 gadgets were produced and it cost a total of \$2,500, what is the value of b ?

(A) -150
(B) -100
(C) 0
(D) 100
(E) 150

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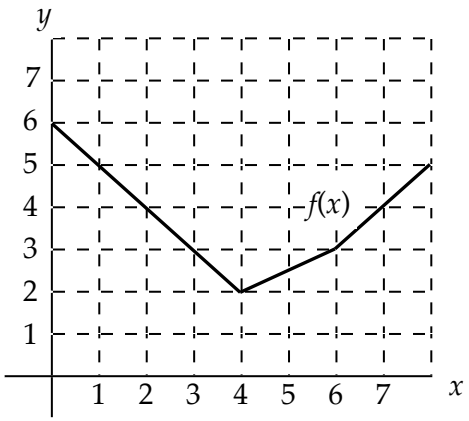
10. When n is divided by number of grades in a list, the result is the average of all the grades. What does n represent?

(A) The sum of all the grades
(B) Half the sum of the grades
(C) The average of the grades
(D) The number of grades
(E) Half of the number of grades

11. A two-digit number is multiplied by itself. The product can have a units digit of...

I. 3
II. 6
III. 8

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



12. The graph of $y = f(x)$ is shown above. If $f(4) = b$, what is the value of $f(b)$?

(A) 2
(B) 3
(C) 4
(D) 5
(E) 6

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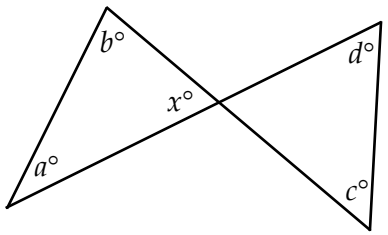
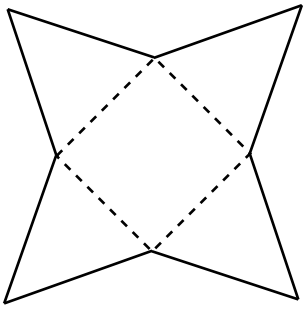


13. In the figure, what is the value of $a° + b° + c° + d°$ in terms of $x°$?

(A) $x°$
(B) $2x°$
(C) $180° - x°$
(D) $360° - x°$
(E) $360° - 2x°$



14. If the perimeter of the square in the figure above is 64 and the triangles are all equilateral triangles, what is the perimeter of the figure outlined by the solid line?

(A) 80
(B) 96
(C) 100
(D) 108
(E) 128

15. After the first term, each term in a sequence is 50% greater than the preceding term. If t is the first term of the sequence and $t \neq 0$, what is the value of the third term expressed as a fraction in terms of t ?

(A) $\frac{9t}{4}$
(B) $\frac{5t}{3}$
(C) $\frac{5t}{2}$
(D) $\frac{t}{3}$
(E) $\frac{9t}{5}$

16. If $3 \leq a \leq 10$ and $-3 \leq b \leq 3$, which of the following gives the set of all possible values of $a + b$?

(A) $a + b = 4$
(B) $0 \leq a + b \leq 7$
(C) $0 \leq a + b \leq 10$
(D) $-9 \leq a + b \leq 30$
(E) $0 \leq a + b \leq 13$

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