

SECTION 5

Time – 25 minutes

18 Questions

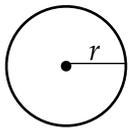
Turn to Section 5 of your answer sheet to answer the questions in this section.

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

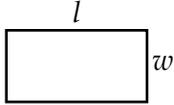
- The use of calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possibly EXCEPT when it is stated in a specific problem that the figure is not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

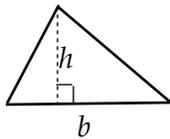


$$A = \pi \cdot r^2$$

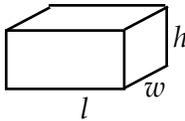
$$C = 2 \cdot \pi \cdot r$$



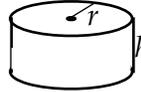
$$A = l \cdot w$$



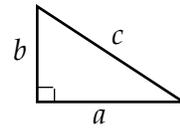
$$A = \frac{1}{2} b \cdot h$$



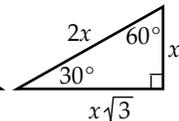
$$V = l \cdot w \cdot h$$



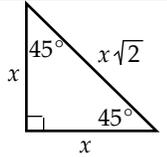
$$V = \pi \cdot r^2 \cdot h$$



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



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.

- Nate is smaller than Beth but taller than Sam. Let n , b , and s represent the height, in inches, of Nate, Beth, and Sam. Which of the following is a true inequality statement?
 - $n < b < s$
 - $s < n < b$
 - $s < b < n$
 - $b < n < s$
 - $b < s < n$
- If $2a + 3b = 22$, $b = -3c$, and $c = -2$, what is the value of a ?
 - 6
 - 2
 - 2
 - 3
 - 8
- Three different line segments are equal and the sum of their lengths is 20. What is the average (arithmetic mean) of the lengths of the three line segments?
 - 0
 - $\frac{10}{3}$
 - $\frac{20}{3}$
 - 20
 - 60

GO ON THE THE NEXT PAGE 

4. A "prime square" is a perfect square that has only three positive integer factors, 1, itself, and a prime number. Which of the following is NOT a "prime square"?

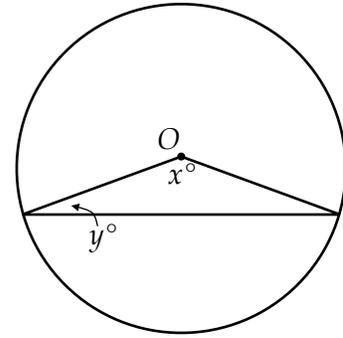
(A) 9
 (B) 25
 (C) 36
 (D) 49
 (E) 121

-
5. Set A contains all integers that can be written as $n^2 - 3$, where n is a nonzero integer. All of the following integers are in Set A EXCEPT?

(A) 13
 (B) 22
 (C) 33
 (D) 52
 (E) 61

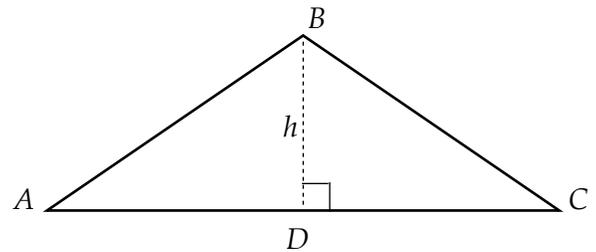
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6. Let x and y be positive integers. If $x^2y^3 = 288$, what is the value of $x - y$?

(A) 2
 (B) 4
 (C) 6
 (D) 7
 (E) 8



7. In the figure above, point O is the center of the circle. If $y = 20$, what is the value of x ?

(A) 130
 (B) 140
 (C) 150
 (D) 160
 (E) 165



Note: Figure not drawn to scale

8. In $\triangle ABC$, $\angle A = 45^\circ$ and $\angle C = 45^\circ$. What is the area of $\triangle ABC$ in terms of h ?

(A) $\frac{h^2}{2}$
 (B) $\frac{2h^2}{3}$
 (C) $2h$
 (D) $2h^2$
 (E) h^2

Directions: For Student-Produce Response questions 9-18, use the grids at the bottom of the answer sheet page on which you have answered questions 1-8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Write answer in boxes →

Answer: $\frac{5}{13}$

5	/	1	3
○	●	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

← Fraction Line

Grid in results

Answer: 7.4

	7	.	4
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

← Decimal Line

Answer: 231
Either position is correct

2	3	1	
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

	2	3	1
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

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

- Mark no more than one circle in any column.
 - Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
 - Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
 - Some problems may have more than one correct answer. In such cases, grid only one answer.
 - No question has a negative answer.
- Mixed numbers such as $4\frac{1}{2}$ must be gridded as 4.5 or 9/2. (If

4	1	/	2
○	○	○	○

 is gridded, it will be interpreted as $\frac{41}{2}$, not $4\frac{1}{2}$.)

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

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

	2	/	3
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

.	6	6	6
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

	6	6	7
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

9. What is the smallest two-digit integer that is a factor of 72?

10. When a positive odd integer n is decrease by 50 percent of itself, the result is between 4 and 7. What is one possible value of n ?



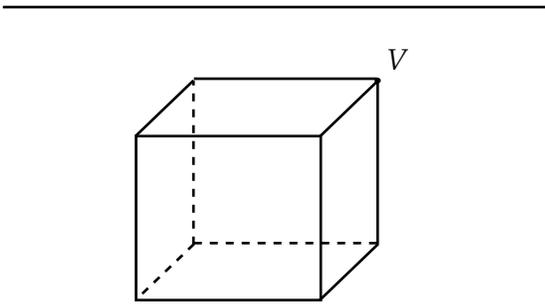
11. A candy store ordered \$1,200 worth of candy. Lolly Pops cost \$2 each and Suckers cost \$4 each. If three times as many Lolly Pops were ordered than Suckers, how many pieces of candy were ordered all together?
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12. If a recipe calls for 6 cups of sugar to make 14 cookies, how many cups of sugar are required to make 63 cookies?

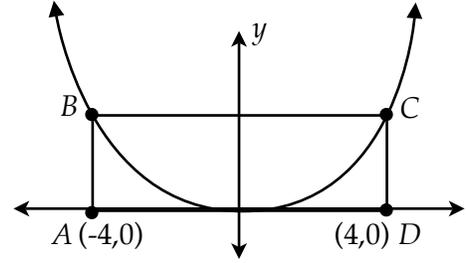
13. In the xy -coordinate system, the center of a circle is at point $(-3,4)$, and the circle goes through the origin $(0,0)$. What is the diameter of the circle?
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14. The area of a rectangular plot of land is $240 y^2$. If the length of one side is 12 yards, what is the perimeter of the plot, in yards?

15. If $3(a + b)(a + b) = 120$, and $a^2 + b^2 = 10$, what is the value of ab ?

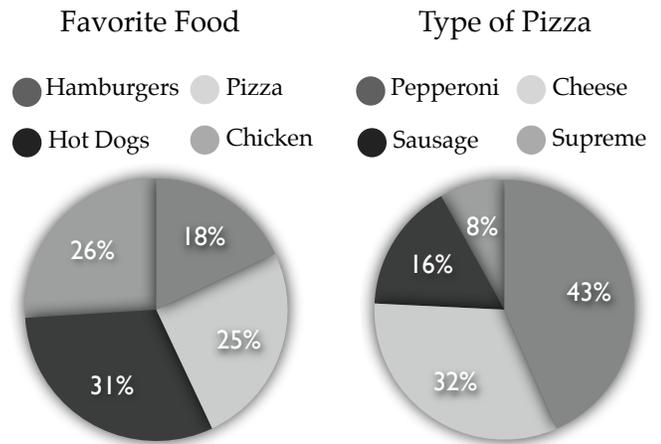


16. The three-dimensional cube above has 6 faces, 8 vertices, and 12 edges. If line segments are to be drawn connecting vertex V with each of the other 7 vertices in the figure, how many of these line segments will not lie on an edge of the cube?



Note: figure not drawn to scale

17. In the figure above, $ABCD$ is a rectangle. Points B and C lie on the graph of $y = px^2$, where p is a constant. If the area of the $ABCD$ is 32, what is the value of p ?



18. If 500 students were asked what their favorite food was, how many students prefer Cheese Pizza?

