

## Basic Skills

### Mathematics Sample Items

1. If the sum of two nonzero whole numbers is odd and their product is even, which of the following statements about the numbers must be true?

- A. Neither number is prime.
- B. Only one number is prime.
- C. Both numbers are odd.
- D. Only one number is odd.

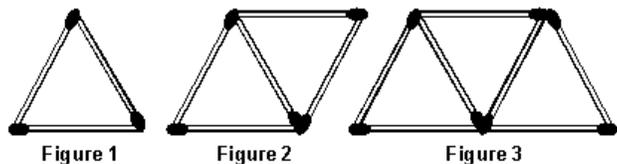
2. Use the table below to answer the question that follows.

$x$	$y$
1	4
2	3
3	2
4	1
5	0

The table above gives several points on the graph of a line. Which of the following points will also be on the graph of the line?

- A. (6, 1)
- B. (0, 3)
- C. (7, -2)
- D. (0, -3)

3. Use the diagram below to answer the question that follows.



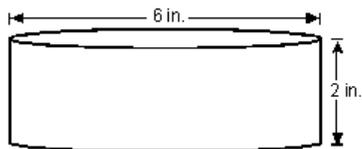
A pattern of triangles is constructed using matchsticks of equal length, as shown above. If the pattern of triangles is continued, and  $t$  equals the number of triangles in each figure, which of the following expressions will give the total number of matchsticks used to draw a given figure?

- A.  $5t - 4$
- B.  $4t + 1$
- C.  $3t$
- D.  $2t + 1$

4. A laser printer purchased for \$3350 is expected to be worth only \$800 in 6 years. If the value of the printer is modeled by an equation of the form  $y = mx + b$ , where  $y$  equals the value and  $x$  equals the number of years, which of the following describes the significance of  $m$ ?

- A. the initial value of the printer
- B. the rate of change in value of the printer
- C. the average value of the printer
- D. the minimum value of the printer

5. Use the diagram below to answer the question that follows.



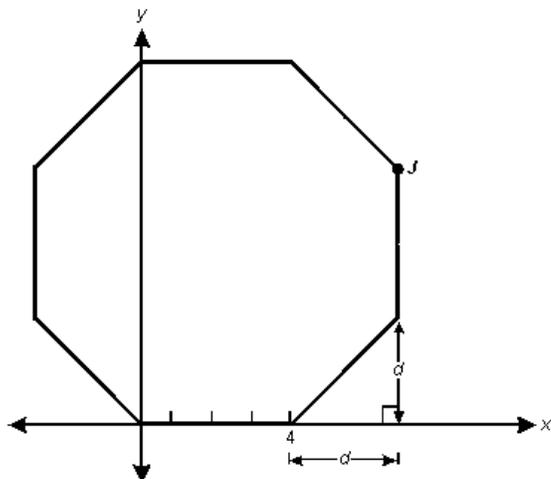
A piece of cheese in the shape of a right circular cylinder, as shown above, is divided equally among 9 people. What is the volume of each person's portion?

- A.  $2\pi$  cubic inches
- B.  $6\pi$  cubic inches
- C.  $12\pi$  cubic inches
- D.  $18\pi$  cubic inches

6. A cube is built from a length of pipe 192 centimeters long. The pipe is cut into pieces of equal length so that each piece is the edge of the cube. Assuming no waste, what is the side length of the cube?

- A. 16 centimeters
- B. 24 centimeters
- C. 32 centimeters
- D. 48 centimeters

7. Use the graph below to answer the question that follows.



If the figure shown above is a regular octagon, what is the  $y$ -coordinate of point  $J$ ?

- A. 4
- B.  $2 + 2\sqrt{2}$
- C.  $4 + 2\sqrt{2}$
- D. 8

8. Five students are to present projects to the class. One of the students has asked to go first. Allowing for this request, in how many ways can the students be ordered for making their presentations?

- A. 24
- B. 48
- C. 96
- D. 120

9. Which of the following mathematical concepts are being applied when a photographer enlarges 4-inch by 6-inch photos to 12-inch by 18-inch photos?

- A. analyzing patterns
- B. ratios and proportions
- C. applying percents
- D. estimation and rounding

10. Use the table below to answer the question that follows.

Input ( $x$ )	Output ( $f(x)$ )
1	-4
2	-1
3	2

Which of the following functions represents the input  $x$  and output  $f(x)$  from the table of values above?

- A.  $f(x) = 2x - 3$
- B.  $f(x) = -4x$
- C.  $f(x) = x - 1$
- D.  $f(x) = 3x - 7$

### Answer Key

Item Number	Correct Response	Objective
1	D	0011
2	C	0012
3	D	0012
4	B	0013
5	A	0014
6	A	0015
7	C	0015
8	A	0016
9	B	0017
10	D	0017

[↑ Top of Page](#)

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