

Use this space for computations.

- 12 Olivia entered a baking contest. As part of the contest, she needs to demonstrate how to measure a gallon of milk if she only has a teaspoon measure. She converts the measurement using the ratios below:

$$\frac{4 \text{ quarts}}{1 \text{ gallon}} \cdot \frac{2 \text{ pints}}{1 \text{ quart}} \cdot \frac{2 \text{ cups}}{1 \text{ pint}} \cdot \frac{\frac{1}{4} \text{ cup}}{4 \text{ tablespoons}} \cdot \frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}$$

Which ratio is *incorrectly* written in Olivia's conversion?

- (1)  $\frac{4 \text{ quarts}}{1 \text{ gallon}}$                       (3)  $\frac{\frac{1}{4} \text{ cup}}{4 \text{ tablespoons}}$
- (2)  $\frac{2 \text{ pints}}{1 \text{ quart}}$                       (4)  $\frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}$

- 13 If  $y = 3x^3 + x^2 - 5$  and  $z = x^2 - 12$ , which polynomial is equivalent to  $2(y + z)$ ?

- (1)  $6x^3 + 4x^2 - 34$                       (3)  $6x^3 + 3x^2 - 22$
- (2)  $6x^3 + 3x^2 - 17$                       (4)  $6x^3 + 2x^2 - 17$

- 14 An outdoor club conducted a survey of its members. The members were asked to state their preference between skiing and snowboarding. Each member had to pick one. Of the 60 males, 45 stated they preferred to snowboard. Twenty-two of the 60 females preferred to ski. What is the relative frequency that a male prefers to ski?

- (1) 0.125                      (3)  $\overline{0.333}$
- (2) 0.25                      (4)  $\overline{0.405}$

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15 When the function  $g(x) = \begin{cases} 5x, & x \leq 3 \\ x^2 + 4, & x > 3 \end{cases}$  is graphed correctly, how should the points be drawn on the graph for an  $x$ -value of 3?

- (1) open circles at (3,15) and (3,13)
- (2) closed circles at (3,15) and (3,13)
- (3) an open circle at (3,15) and a closed circle at (3,13)
- (4) a closed circle at (3,15) and an open circle at (3,13)

16 If  $f(x) = 2x^2 + x - 3$ , which equation can be used to determine the zeros of the function?

- (1)  $0 = (2x - 3)(x + 1)$
- (2)  $0 = (2x + 3)(x - 1)$
- (3)  $0 = 2x(x + 1) - 3$
- (4)  $0 = 2x(x - 1) - 3(x + 1)$

17 Each day, a local dog shelter spends an average of \$2.40 on food per dog. The manager estimates the shelter's daily expenses, assuming there is at least one dog in the shelter, using the function  $E(x) = 30 + 2.40x$ .

Which statements regarding the function  $E(x)$  are correct?

- I.  $x$  represents the number of dogs at the shelter per day.
- II.  $x$  represents the number of volunteers at the shelter per day.
- III. 30 represents the shelter's total expenses per day.
- IV. 30 represents the shelter's nonfood expenses per day.

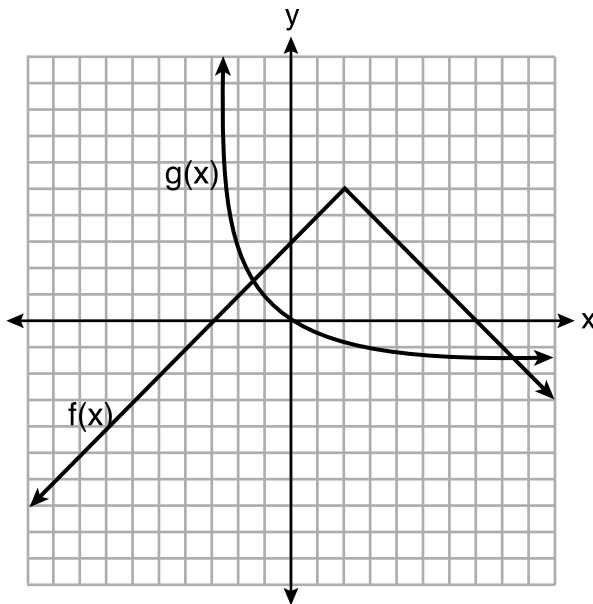
- (1) I and III
- (2) I and IV
- (3) II and III
- (4) II and IV

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18 Which point is *not* in the solution set of the equation  $3y + 2 = x^2 - 5x + 17$ ?

- (1)  $(-2, 10)$                       (3)  $(2, 3)$   
(2)  $(-1, 7)$                       (4)  $(5, 5)$

19 The functions  $f(x)$  and  $g(x)$  are graphed below.



Based on the graph, the solutions to the equation  $f(x) = g(x)$  are

- (1) the  $x$ -intercepts  
(2) the  $y$ -intercepts  
(3) the  $x$ -values of the points of intersection  
(4) the  $y$ -values of the points of intersection

20 For the sequence  $-27, -12, 3, 18, \dots$ , the expression that defines the  $n$ th term where  $a_1 = -27$  is

- (1)  $15 - 27n$                       (3)  $-27 + 15n$   
(2)  $15 - 27(n - 1)$               (4)  $-27 + 15(n - 1)$