

Algebra 1 Quick-Quiz-12112024

Question 1.

If  $f(x) = 3^x$  and  $g(x) = 2x + 5$ , at which value of  $x$  is  $f(x) < g(x)$ ?

- (1)  $-1$                                       (3)  $-3$   
(2)  $2$                                          (4)  $4$

Question 2

When directed to solve a quadratic equation by completing the square, Sam arrived at the equation  $\left(x - \frac{5}{2}\right)^2 = \frac{13}{4}$ . Which equation could have been the original equation given to Sam?

- (1)  $x^2 + 5x + 7 = 0$                       (3)  $x^2 - 5x + 7 = 0$   
(2)  $x^2 + 5x + 3 = 0$                       (4)  $x^2 - 5x + 3 = 0$

Question 3.

The distance a free falling object has traveled can be modeled by the equation  $d = \frac{1}{2}at^2$ , where  $a$  is acceleration due to gravity and  $t$  is the amount of time the object has fallen. What is  $t$  in terms of  $a$  and  $d$ ?

- (1)  $t = \sqrt{\frac{da}{2}}$                                       (3)  $t = \left(\frac{da}{d}\right)^2$   
(2)  $t = \sqrt{\frac{2d}{a}}$                                       (4)  $t = \left(\frac{2d}{a}\right)^2$

Question 4.

A student is asked to solve the equation  $4(3x - 1)^2 - 17 = 83$ .  
The student's solution to the problem starts as

$$4(3x - 1)^2 = 100$$

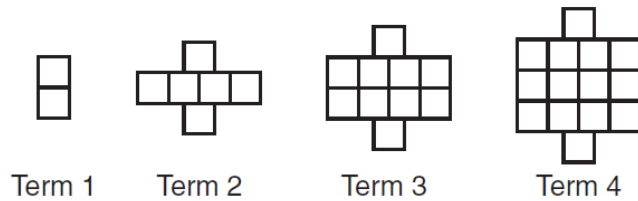
$$(3x - 1)^2 = 25$$

A correct next step in the solution of the problem is

- (1)  $3x - 1 = \pm 5$                       (3)  $9x^2 - 1 = 25$   
 (2)  $3x - 1 = \pm 25$                     (4)  $9x^2 - 6x + 1 = 5$

Question 5.

A pattern of blocks is shown below.



If the pattern of blocks continues, which formula(s) could be used to determine the number of blocks in the  $n$ th term?

I	II	III
$a_n = n + 4$	$a_1 = 2$ $a_n = a_{n-1} + 4$	$a_n = 4n - 2$

- (1) I and II                                  (3) II and III  
 (2) I and III                                (4) III, only

Question 6.

What are the solutions to the equation  $x^2 - 8x = 24$ ?

(1)  $x = 4 \pm 2\sqrt{10}$

(3)  $x = 4 \pm 2\sqrt{2}$

(2)  $x = -4 \pm 2\sqrt{10}$

(4)  $x = -4 \pm 2\sqrt{2}$

Question 7.

John and Sarah are each saving money for a car. The total amount of money John will save is given by the function  $f(x) = 60 + 5x$ . The total amount of money Sarah will save is given by the function  $g(x) = x^2 + 46$ . After how many weeks,  $x$ , will they have the same amount of money saved? Explain how you arrived at your answer.

Question 8.

Which interval represents the range of the function

$$h(x) = 2x^2 - 2x - 4?$$

(1)  $(0.5, \infty)$

(3)  $[0.5, \infty)$

(2)  $(-4.5, \infty)$

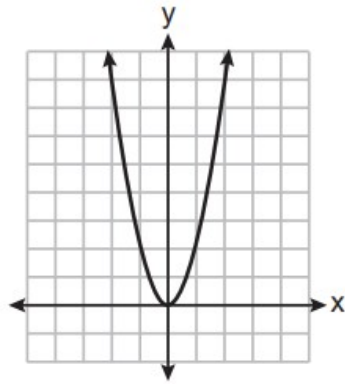
(4)  $[-4.5, \infty)$

Question 9.

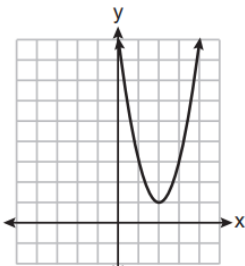
If  $g(x) = -4x^2 - 3x + 2$ , determine  $g(-2)$ .

Question 10.

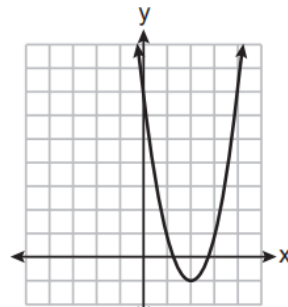
The graph of  $y = f(x)$  is shown below.



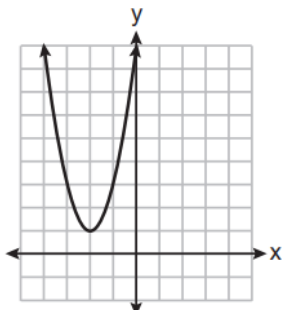
Which graph represents  $y = f(x - 2) + 1$ ?



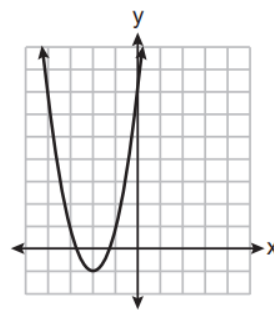
(1)



(3)



(2)



(4)

## Bonus Question

### Question 11

The function  $h(t) = -16t^2 + 48t + 160$  can be used to model the height, in feet, of an object  $t$  seconds after it is launched from the top of a building that is 160 feet tall.

Two other forms of the function are:

$$h(t) = -16(t - 5)(t + 2)$$

$$h(t) = -16(t - 1.5)^2 + 196$$

Which value of the function represents the maximum height of the object?

- A.  $h(0)$
- B.  $h(1.5)$
- C.  $h(2)$
- D.  $h(5)$