Algebra Quick Quiz 12092019

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) $t = \sqrt{\dfrac{da}{2}}$

(3) $t = \left(\dfrac{da}{d}\right)^2$

(2) $t = \sqrt{\dfrac{2d}{a}}$

(4) $t = \left(\dfrac{2d}{a}\right)^2$

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

$$4(3x - 1)^2 = 100$$
$$(3x - 1)^2 = 25$$

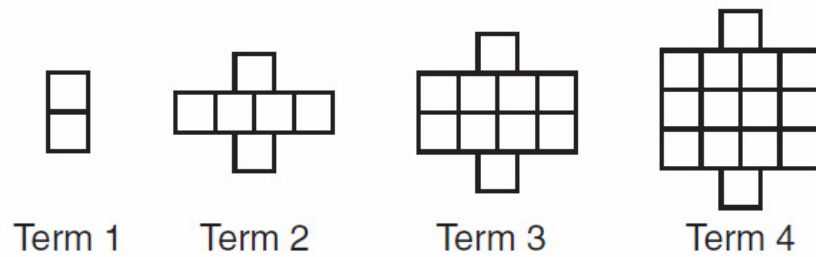A correct next step in the solution of the problem is

(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.

Term 1   Term 2   Term 3   Term 4

If the pattern of blocks continues, which formula(s) could be used to determine the number of blocks in the nth 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

(2) I and III

(3) II 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.

Determine the smallest integer that makes $-3x + 7 - 5x < 15$ true.

Question 9.

You should be able to figure this out without graphing software but you will need to use a calculator though.

A landscaper is creating a rectangular flower bed such that the width is half of the length. The area of the flower bed is 34 square feet. Write and solve an equation to determine the width of the flower bed, to the *nearest tenth of a foot*.

Question 10.

The equation to determine the weekly earnings of an employee at The Hamburger Shack is given by $w(x)$, where x is the number of hours worked.

$$w(x) = \begin{cases} 10x, & 0 \leq x \leq 40 \\ 15(x - 40) + 400, & x > 40 \end{cases}$$

Determine the difference in salary, *in dollars*, for an employee who works 52 hours versus one who works 38 hours.

Bonus Question

Question 11

Beverly did a study this past spring using data she collected from a cafeteria. She recorded data weekly for ice cream sales and soda sales. Beverly found the line of best fit and the correlation coefficient, as shown in the diagram below.

Beverly's Cafeteria Study
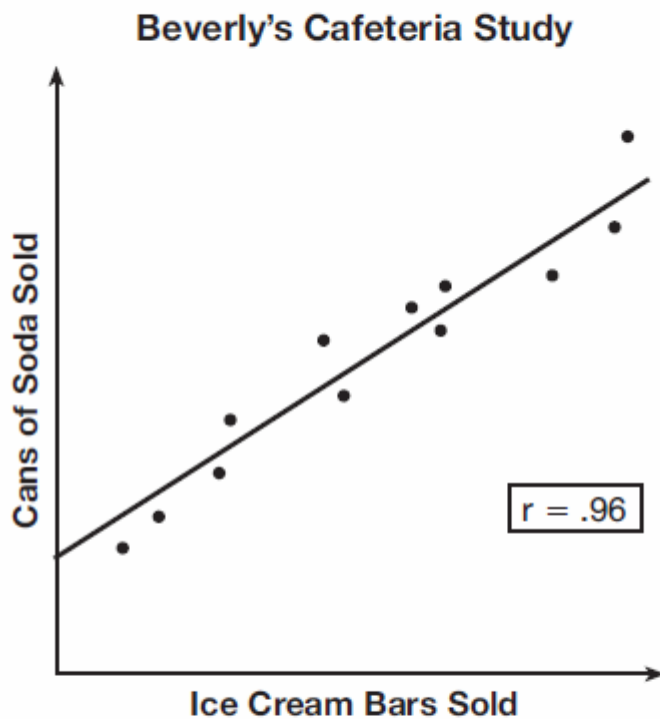
Given this information, which statement(s) can correctly be concluded?

I.   Eating more ice cream causes a person to become thirsty.

II. Drinking more soda causes a person to become hungry.

III. There is a strong correlation between ice cream sales and soda sales.

(1) I, only

(2) III, only

(3) I and III

(4) II and III