Algebra Quick-Quiz-04042022

Question 1

If $f(x) = 2x^2 - 8x + 9$, which statement regarding the vertex form of $f(x)$ is true?

Ⓐ In vertex form, $f(x) = 2(x - 2)^2 + 1$ and therefore has a minimum value of 1.

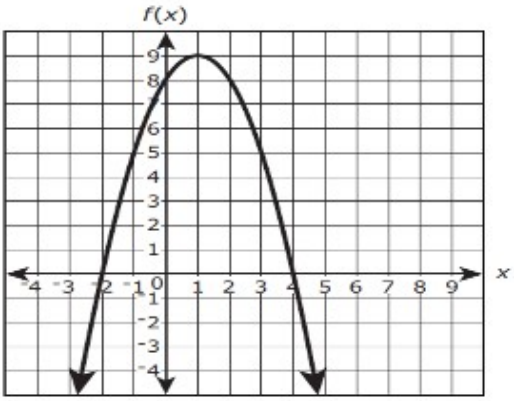
Ⓑ In vertex form, $f(x) = 2(x - 2)^2 + 1$ and therefore has a minimum value of -2.

Ⓒ In vertex form, $f(x) = 2(x - 2)^2 + 4.5$ and therefore has a minimum value of 4.5.

Ⓓ In vertex form, $f(x) = 2(x - 2)^2 + 4.5$ and therefore has a minimum value of -2.

Question 2

The figure shows a graph of the function of $f(x)$ in the xy-coordinate plane, with the vertex at $(1, 9)$ and the zeros at -2 and 4.



The function g is defined by $g(x) = -3x + 2$.

Which statements are true? Select **all** that apply.

Ⓐ $f(-2)$ is greater than $g(-2)$.

Ⓑ $f(-1)$ is less than $g(-1)$.

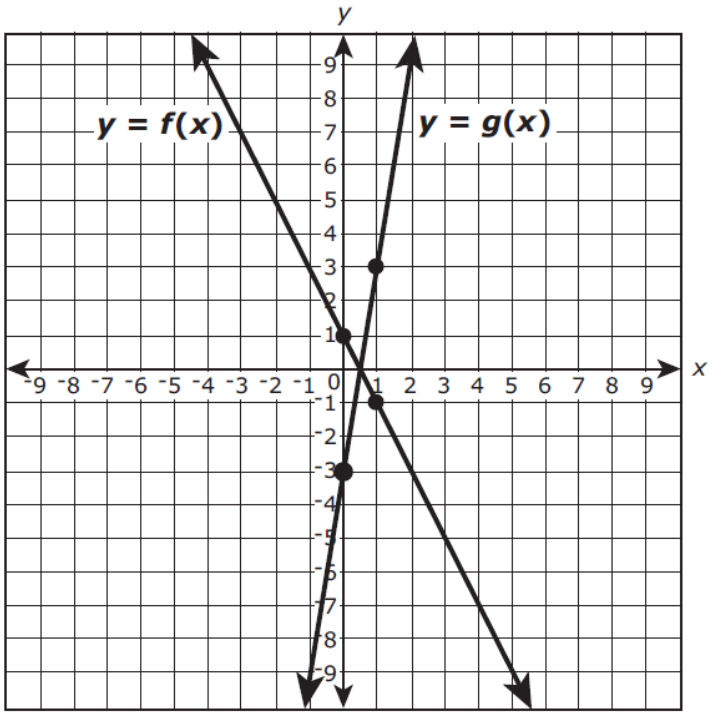
Ⓒ $f(0)$ is greater than $g(0)$.

Ⓓ $f(1)$ is less than $g(1)$.

Ⓔ $f(2)$ is greater than $g(2)$.

Question 3.

The figure shows the graphs of the functions $y = f(x)$ and $y = g(x)$. The four indicated points all have integer coordinates.



If $g(x) = k \cdot f(x)$, what is the value of k?

Question 4.

Caroline knows the height and the required volume of a cone-shaped vase she's designing. Which formula can she use to determine the radius of the vase? Select the correct answer.

Ⓐ $r = \sqrt{\frac{V}{3\pi h}}$

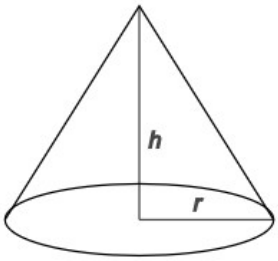
Ⓑ $r = \sqrt{\frac{3V}{\pi h}}$

Ⓒ $r = \frac{\sqrt{3V}}{\pi h}$

Ⓓ $r = \pm\sqrt{\frac{3V}{\pi h}}$

Volume of a cone:

$$V = \pi r^2 \frac{h}{3}$$

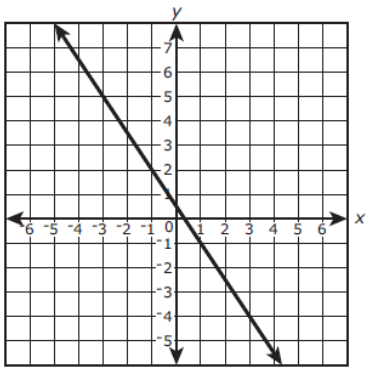


Question 5.

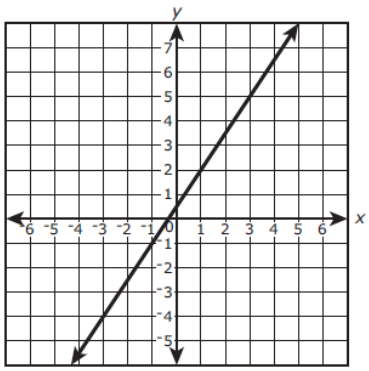
The ordered pairs (20, −29.5), (21, −31), and (22, −32.5) are points on the graph of a linear equation.

Which of the following graphs show **all** of the ordered pairs in the solution set of this linear equation?

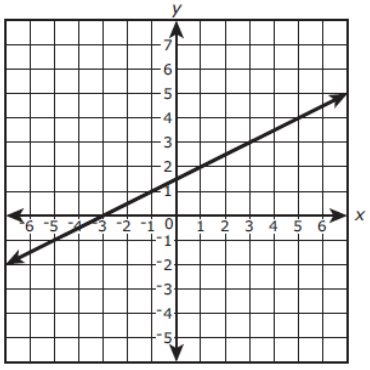
Ⓐ



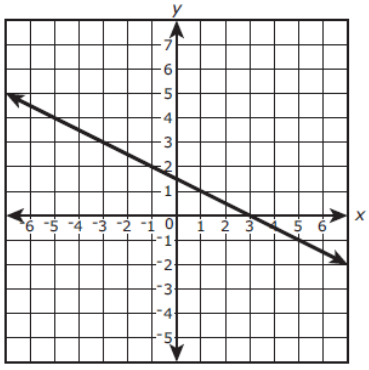
Ⓑ



Ⓒ



Ⓓ



Question 6.

A certain type of lily plant is growing in a pond in such a way that the number of plants is growing exponentially. The number of plants N in the pond at time t is modeled by the function $N(t) = ab^t$, where a and b are constants and t is measured in months. The table shows two values of the function.

t	$N(t)$
0	150
1	450

Which equation can be used to find the number of plants in the pond at time t?

Ⓐ $N(t) = 150(1)^t$

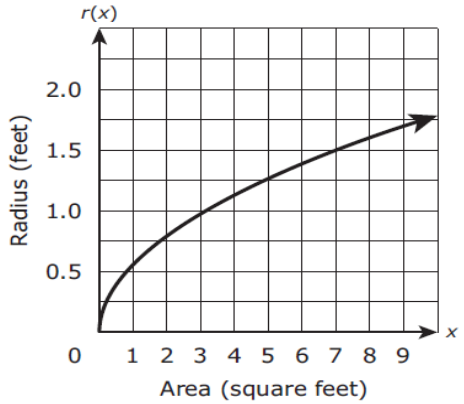
Ⓑ $N(t) = 450(1)^t$

Ⓒ $N(t) = 150(3)^t$

Ⓓ $N(t) = 450(3)^t$

Question 7.

The function $r(x)$ represents the radius of a circle for a given area x. A graph of the function is shown in the figure.



According to the graph what is the approximate average rate of change in the radius of the circle as the area increases from 3 square feet to 7 square feet?

Ⓐ 0.125 foot per square foot

Ⓑ 0.25 foot per square foot

Ⓒ 0.5 foot per square foot

Ⓓ 8 feet per square foot

Question 8.

The cost to manufacture x pairs of sunglasses can be represented by a function $C(x)$. If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true?

Select the correct equation.

Ⓐ $C(4) = 99.50$

Ⓑ $C(398) = 4$

Ⓒ $C(4) = 398$

Ⓓ $C(99.50) = 1$

Question 9.

In a basketball game, Marlene made 16 field goals. Each of the field goals were worth either 2 points or 3 points, and Marlene scored a total of 39 points from field goals.

25. Part A

Let x represent the number of two-point field goals and y represent the number of three-point field goals. Which equations can be used as a system to model the situation?

Select **all** that apply.

Ⓐ $x + y = 16$

Ⓑ $x + y = 39$

Ⓒ $2x + 3y = 16$

Ⓓ $2x + 3y = 39$

Ⓔ $3x + 2y = 16$

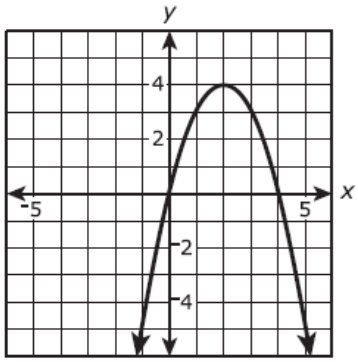
Ⓕ $3x + 2y = 39$

Part B

How many three-point field goals did Marlene make in the game?

Question 10.

The function $f(x) = 4x - x^2$ is graphed in the xy-coordinate plane as shown.



27. Part A

Based on the graph of the function, which statements are true?

Select **all** that apply.

Ⓐ f is increasing on the interval $x < 0$.

Ⓑ f is decreasing on the interval $x < 0$.

Ⓒ f is increasing on the interval $0 < x < 2$.

Ⓓ f is decreasing on the interval $0 < x < 2$.

Ⓔ f is increasing on the interval $2 < x < 4$.

Ⓕ f is decreasing on the interval $2 < x < 4$.

Ⓖ f is increasing on the interval $x > 4$.

Ⓗ f is decreasing on the interval $x > 4$.

Bonus Question

Question 11a.

The area, A, in square feet, of a rectangular storage bin in a warehouse is given by the function $A(x) = -2x^2 + 36x$, where x is the width, in feet, of the storage bin.

31. Part A

If the function is graphed in a coordinate plane, which statement would be true?

Ⓐ The x-intercepts of the function are 0 and 8, which are a lower bound and an upper bound for the possible values of the length of the storage bin.

Ⓑ The x-intercepts of the function are 0 and 8, which are a lower bound and an upper bound for the possible values of the width of the storage bin.

Ⓒ The x-intercepts of the function are 0 and 18, which are a lower bound and an upper bound for the possible values of the length of the storage bin.

Ⓓ The x-intercepts of the function are 0 and 18, which are a lower bound and an upper bound for the possible values of the width of the storage bin.

Question 11b.

Part B

The process of completing the square can be used to calculate the width, in feet, of the storage bin that gives a maximum area. What is the missing value?

$A = -2x^2 + 36x$

$A = -2(x - 9)^2 + ?$