Algebra Quick-Quiz-04012022
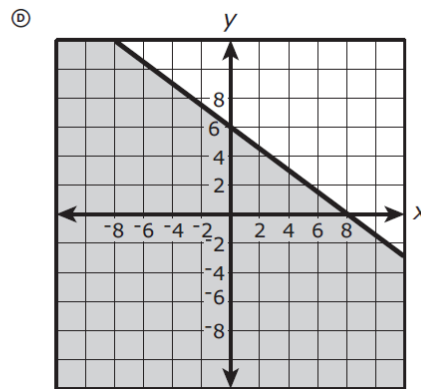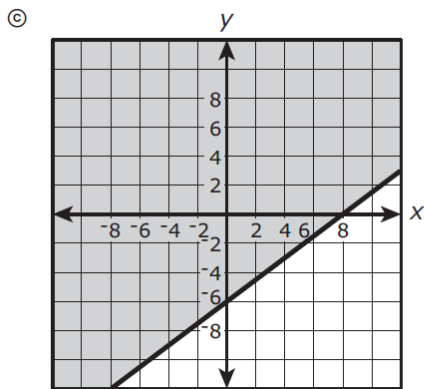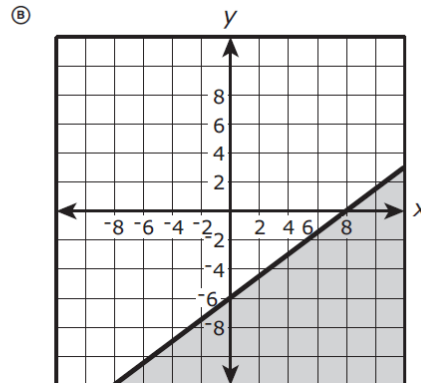
Question 1

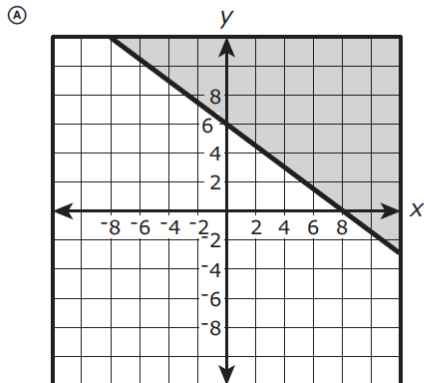In the xy-coordinate plane, the graph of the equation $y = 3x^2 - 12x - 36$ has zeros at $x = a$ and $x = b$, where $a < b$. The graph has a minimum at $(c, -48)$. What are the values of a, b, and c ?

Ⓐ $a = 2$, $b = 4$, $c = 2$

Ⓑ $a = -2$, $b = 6$, $c = 2$

Ⓒ $a = -3$, $b = 3$, $c = 0$

Ⓓ $a = 3$, $b = 6$, $c = 2$

Question 2

Which is a graph of the solution set of the inequality $3x - 4y \le 24$?

Question 3.

Elephant Population Estimates—Namibia

Combined estimates for Etosha National Park and the Northwestern Population

Year	Base Year	Estimated Number of Elephants
1998	3	3,218
2000	5	3,628
2002	7	3,721
2004	9	3,571

The elephant population in northwestern Namibia and Etosha National Park can be predicted by the expression $2{,}649(1.045)^{b}$, where b is the number of years since 1995.

What does the value 2,649 represent?

Ⓐ the predicted increase in the number of elephants in the region each year

Ⓑ the predicted number of elephants in the region in 1995

Ⓒ the year when the elephant population is predicted to stop increasing

Ⓓ the percentage the elephant population is predicted to increase each year

Question 4.

Jerome is constructing a table of values that satisfies the definition of a function.

Input	−13	20	0	−4	11	−1	17	
Output	−15	−11	−9	−2	−1	5	5	13

Which number(s) can be placed in the empty cell so that the table of values satisfies the definition of a function?

Select **all** that apply.

Ⓐ −5

Ⓑ −1

Ⓒ 0

Ⓓ 2

Ⓔ 11

Ⓕ 17

Question 5.

The expression $3x^2 - 33x - 180$ can be factored into the form $a(x + b)(x + c)$, where a, b, and c are constants, to reveal the zeros of the function defined by the expression. What are the zeros of the function defined by $3x^2 - 33x - 180$?

Select **all** that apply.

Ⓐ −15

Ⓑ −10

© −6

Ⓓ −4

Ⓔ 4

Ⓕ 6

Ⓖ 10

Ⓗ 15

Question 6.

Find the equation that is equivalent to the quadratic equation shown.

$$x^2 - 6x - 27 = 0$$

Ⓐ $x(x - 3) = 27$

Ⓑ $(x - 6)^2 = 63$

© $(x - 3)^2 = 36$

Ⓓ $(x - 3)^2 = 28$

Question 7.

An expression is shown.

$$-3a(a + b - 5) + 4(-2a + 2b) + b(a + 3b - 7)$$

Which expression is equivalent to the expression shown?

Ⓐ $-11a^2 + 3b^2 - 2ab + 7a + b$

Ⓑ $-11a^2 + 3b^2 - 4ab + 7a + b$

Ⓒ $-3a^2 + 3b^2 - 2ab + 7a + b$

Ⓓ $-3a^2 + 3b^2 - 4ab + 7a + b$

Question 8.

A ball was thrown upward into the air. The height, in feet, of the ball above the ground t seconds after being thrown can be determined by the expression $-16t^2 + 40t + 3$. What is the meaning of the 3 in the expression? Select the correct answer.

Ⓐ The ball takes 3 seconds to reach its maximum height.

Ⓑ The ball takes 3 seconds to reach the ground.

Ⓒ The ball was thrown from a height of 3 feet.

Ⓓ The ball reaches a maximum height of 3 feet.

Question 9.

A local theater sells admission tickets for $9.00 on Thursday nights. At capacity, the theater holds 100 customers. The function $M(n) = 9n$ represents the amount of money the theater takes in on Thursday nights, where n is the number of customers. What is the domain of $M(n)$ in this context? Select the correct answer.

Ⓐ all whole numbers

Ⓑ all non-negative rational numbers

Ⓒ all non-negative integers that are multiples of 9

Ⓓ all non-negative integers less than or equal to 100

Question 10.

$$y = x^2 - 2x - 5$$
$$y = x^3 - 2x^2 - 5x - 9$$

When the solutions to each of the two equations shown are graphed in the xy-coordinate plane, the graphs of the solutions intersect at a point. What is the y-coordinate of the point of intersection?

Bonus Question

Question 11a

Use the method of completing the square to determine the exact values of x for the equation $x^2 - 8x + 6 = 0$.

Question 11b.

Use the information provided to answer Part A and Part B for question 24.

During the 1st day of a canned-goods drive, Jasmine's homeroom teacher collected 2 cans. During the 3rd day, the teacher collected 8 cans. Let D represent each collection day, and let N represent the number of canned goods collected on that day.

24. **Part A**

   Based on the situation, Jasmine claims that the number of canned goods collected can be modeled by an exponential function. What is the number of canned goods collected on the 6th day based on an exponential model?

   Part B

   Ramon disagrees with Jasmine and claims that the number of canned goods collected can be modeled by a linear function.

   Which statement is true about the number of cans predicted to be collected on the 6th day based on the two models?

   Ⓐ The number of cans predicted to be collected on the 6th day using a linear model is greater than that predicted using an exponential model.

   Ⓑ The number of cans predicted to be collected on the 6th day using a linear model is less than that predicted using an exponential model.

   Ⓒ The number of cans predicted to be collected on the 6th day using a linear model is equal to that predicted using an exponential model.

   Ⓓ There is not enough information to determine the relationship between the number of cans predicted to be collected on the 6th day using a linear model and that predicted using an exponential model.