Enhanced Mid-Topic Assessment

Name _____ Date _____

Part A: Multiple-Choice Questions

1. What is the solution set of the quadratic inequality $x^2 + 2x - 21 < 14$?

a. $x \in (-5, 7)$

b. $x \in (-7, 5)$

c. $x \in [-5, 7]$

d. $x \in [-7, 5]$

2. What is the solution set of the quadratic inequality $x^2 - 5x - 35 \geq 15$?

a. $x \in (-\infty, -5)$ or $x \in (10, \infty)$

b. $x \in (-\infty, -10)$ or $x \in (5, \infty)$

c. $x \in (-\infty, -5]$ or $x \in [10, \infty)$

d. $x \in (-\infty, -10]$ or $x \in [5, \infty)$

3. Which statement about the relationship between a function and its inverse is true?

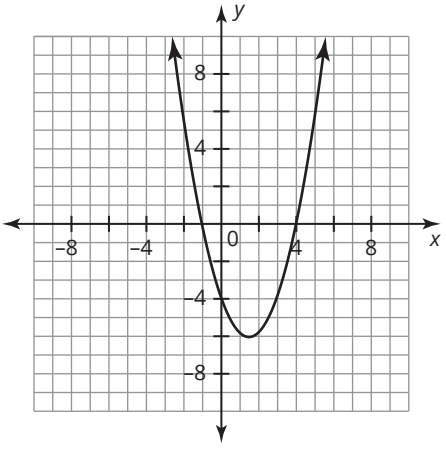
a. The point $(-x, -y)$ is on the graph of the inverse function.

b. The graph of the inverse function is the reflection of the function across the y-axis.

c. The graph of the inverse function is the reflection of the function across the line $y = x$.

d. The point $(x, -y)$ is on the graph of the inverse function.

4. The function $h(x)$ is graphed. Which point will be on the graph of its inverse?



a. (–5, 6)

b. (2, –6)

c. (4, –3)

d. (–4, 3)

Part B: Open-Response Questions

5. A golf ball is hit upward from a height of 0.1 feet with an initial vertical velocity of 150 feet per second. When is the golf ball above 100 feet? Round to the nearest tenth. Recall that vertical motion can be represented by the equation $h(t) = -16t^2 + v_0t + h_0$.

6. Brendan and his brother are playing a guessing game. Brendan tells his brother that he is thinking of two negative integers. The first number minus the second number is 3. The square of the first number minus 3 times the second number is equal to 19.

a. Write a system of equations for the situation.

b. Solve the system of equations for the situation.

c. Explain if the solution(s) to the system make sense in the problem situation.

7. Solve the system of equations algebraically over the set of real numbers.

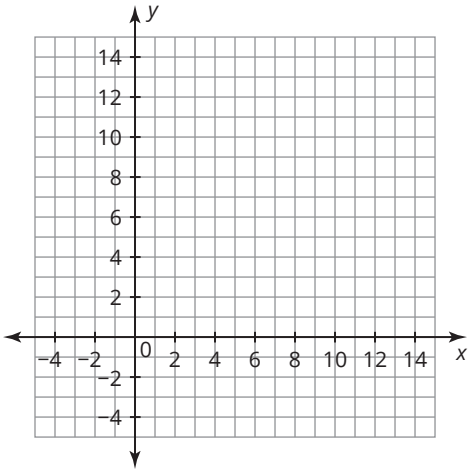
$$\begin{cases} y = 3x + 3 \\ y = -x^2 - 3x + 3 \end{cases}$$

8. Determine the inverse of the function.

$f(x) = 4x^2 - 16$

9. Analyze the function $f(x) = \frac{1}{2}x^2 + 7$.

a. Sketch a graph of the function and its inverse. Use a solid line for the function and a dashed line for its inverse.

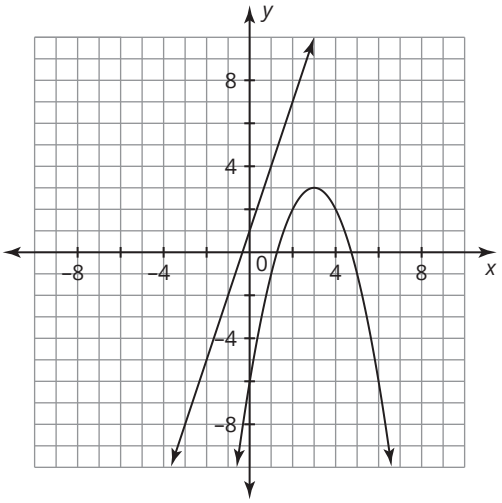


b. Is the inverse of $f(x)$ a function? If yes, explain your reasoning. If no, explain how can you restrict the domain of $f(x)$ so that $f^{-1}(x)$ is a function.

Part C: Griddable Response Questions

Record your answers and fill in the bubbles.

10. How many solutions does this system of equations have?



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	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
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