

Enhanced End of Topic Assessment

Name _____ Date _____

Part A: Multiple-Choice Questions

1. A vendor at a craft show sold items for \$4.50, \$6.00, and \$7.50. Altogether, the vendor sold 87 items for a total of \$489. The vendor sold 5 more items for \$6.00 than for \$7.50. Which system of equations could you use to determine how many of each item were sold?

a.
$$\begin{cases} x + y + z = 489 \\ z = y + 5 \\ 4.5x + 6y + 7.5z = 87 \end{cases}$$

b.
$$\begin{cases} x + y + z = 489 \\ y = z + 5 \\ 4.5x + 6y + 7.5z = 87 \end{cases}$$

c.
$$\begin{cases} x + y + z = 87 \\ y = z + 5 \\ 4.5x + 6y + 7.5z = 489 \end{cases}$$

d.
$$\begin{cases} x + y + z = 87 \\ z = y + 5 \\ 4.5x + 6y + 7.5z = 489 \end{cases}$$

2. What is the solution to the system of equations?

$$\begin{cases} x + y + z = 18 \\ z = 2y \\ 5x + 2y + 6z = 85 \end{cases}$$

a. $x = 9, y = 4, z = 8$

b. $x = 3, y = 5, z = 10$

c. $x = 9, y = 3, z = 6$

d. $x = 12, y = 2, z = 4$

3. What is the solution to the system of equations?

$$\begin{bmatrix} -2 & 1 & -1 \\ 1 & 3 & -2 \\ 3 & 1 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \\ -6 \end{bmatrix}$$

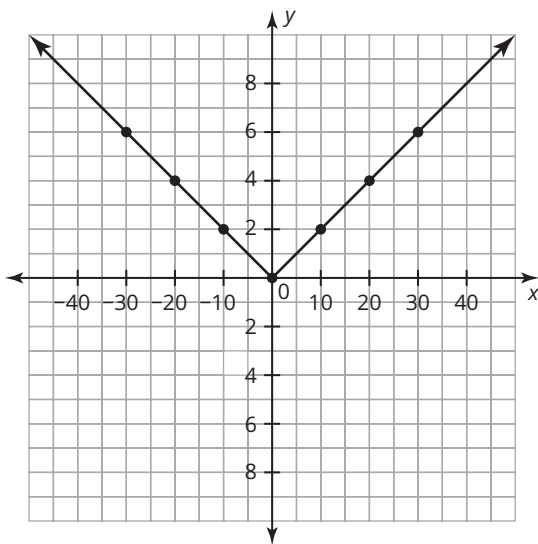
a. $(-\frac{7}{3}, 1, -\frac{2}{3})$

b. $(1, -9, -14)$

c. $(\frac{5}{3}, 1, -\frac{4}{3})$

d. $(4, 3, -2)$

4. The graph of $g(x)$ is shown.



Which statement is true?

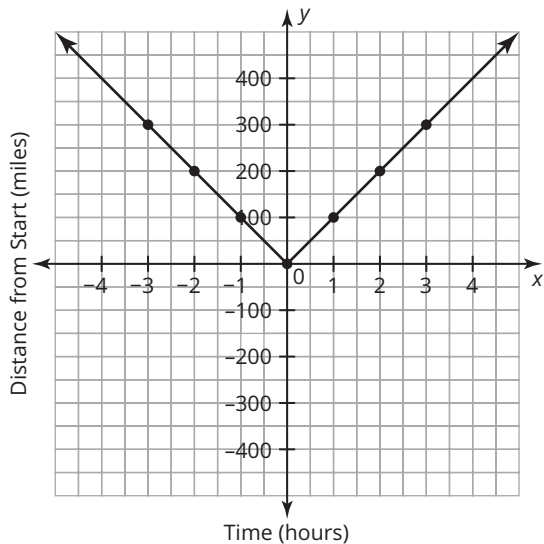
a. The domain is all real numbers.

b. The domain is $x \geq 0$.

c. The range is $f(x) \geq -2$.

d. The range is $-30 \leq f(x) \leq 30$.

5. A regional train passes by a certain train station halfway along its trip each day. The graph models the train traveling at a constant speed. Which equation best represents the graph?



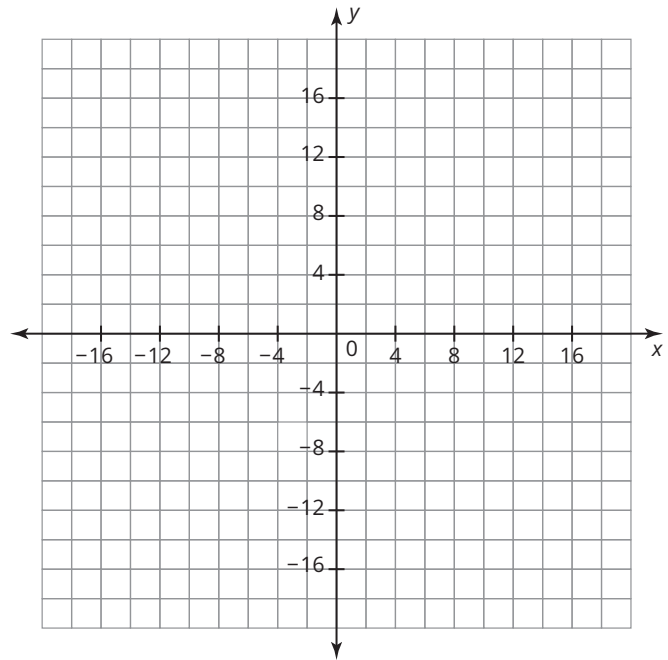
- a. $f(x) = |100x|$
- b. $f(x) = |x + 100|$
- c. $f(x) = |100 - x|$
- d. $f(x) = |x| + 100$

Part B: Open-Response Questions

6. Solve the system of equations. Verify each solution graphically.

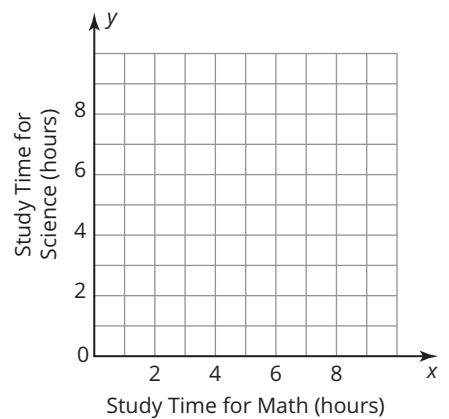
$$y = 2x + 4$$

$$y = x^2 - 4$$



- 7.** Rachel plans to study at most 8 hours total for her math and science exams. She feels that she should spend at least 3 hours studying math. She wants to spend at least twice as much time studying math as science.
- a.** Write a system of inequalities to represent the constraints of this problem situation. Be sure to define your unknowns.

- b.** Solve the system of inequalities by graphing on the coordinate plane.
- c.** Suppose Rachael decides to spend 4 hours studying math and 3 hours studying science. Is this solution reasonable?



- 8.** At a bake sale, bags of cookies sold for \$2.00, \$2.50, or \$3.00, depending on the size. Altogether, 106 cookies were sold, and \$256 was earned for the sales. Twice as many cookies were sold at the \$2.00 charge than at the \$3.00 charge.
- a.** Write a system of equations to represent this situation. Be sure to define your variables.
- b.** Solve the system using substitution. How many cookies were sold at each price?

9. Solve the system of linear equations using Gaussian elimination.

$$\begin{cases} x + 2y + z = 10 \\ 3x + y = 9 \\ -x + 2y = 4 \end{cases}$$

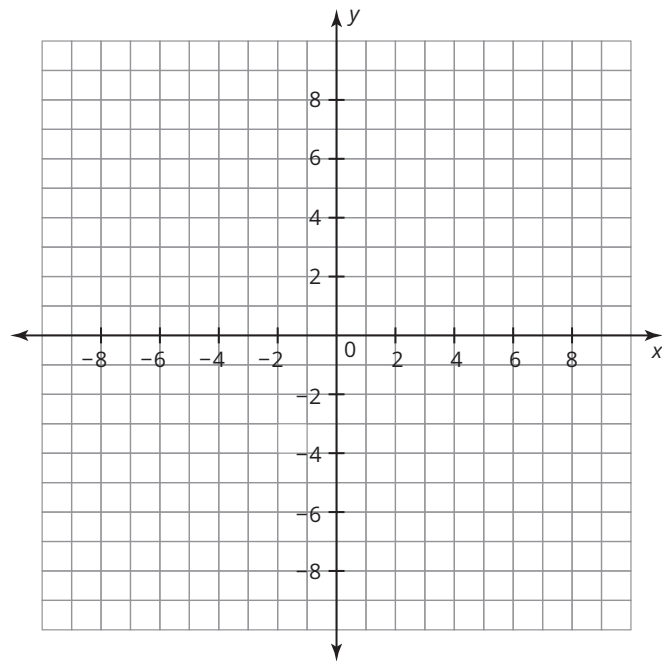
10. Calculate the solution to the system of equations using matrices.

$$\begin{cases} 2x - y = 6 \\ -x + 2y + 3z = 3 \\ x + 4z = 8 \end{cases}$$

11. Consider $f(x) = |x|$.

a. Graph $g(x) = |x - 3| - 2$.

b. Use your graph of $g(x)$ to identify the domain, range, and maximum or minimum of the function.

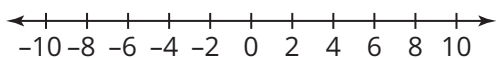


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c. Explain the difference between the graph of $f(x)$ and the graph of $g(x)$.

12. Solve the absolute value equation $|2x - 4| = 10$.

13. Solve the inequality $|-2x + 6| - 8 < 4$ and graph the solution on the number line.



Part C: Griddable Response Questions

Record your answers and fill in the bubbles.

14. What value of b would make the function $f(x) = |bx|$ compress horizontally by a factor of $\frac{1}{3}$ and reflect across the y -axis.

+	0	0	0	0	0	0	0
-	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	6	6	6	6
	7	7	7	7	7	7	7
	8	8	8	8	8	8	8
	9	9	9	9	9	9	9

15. Consider the equation $|x| - 8 = a$. What value of a would make the equation have only one solution?

+	0	0	0	0	0	0	0
-	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	6	6	6	6
	7	7	7	7	7	7	7
	8	8	8	8	8	8	8
	9	9	9	9	9	9	9