

Algebra I Semester 1 Practice Exam

1. Find the product: $-8 \begin{bmatrix} -3 & 2 & 4 \\ 0 & 5 & -7 \\ 6 & 6 & -5 \end{bmatrix}$

A. $\begin{bmatrix} 24 & -16 & -32 \\ 0 & -40 & 56 \\ -48 & -48 & 40 \end{bmatrix}$

B. $\begin{bmatrix} -3 & 2 & 4 \\ 0 & -40 & 56 \\ 6 & 6 & -5 \end{bmatrix}$

C. $\begin{bmatrix} 24 & -16 & -32 \\ 0 & 5 & -7 \\ 6 & 6 & -5 \end{bmatrix}$

D. $\begin{bmatrix} 24 & 2 & 4 \\ 0 & 5 & -7 \\ 48 & 6 & -5 \end{bmatrix}$

2. Find the difference of the matrices:

$$\begin{bmatrix} 4 & -1 \\ 7 & 5 \end{bmatrix} - \begin{bmatrix} 2 & -2 \\ 5 & -6 \end{bmatrix}$$

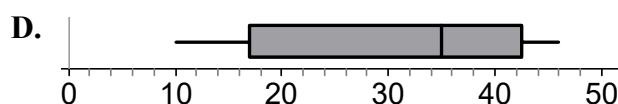
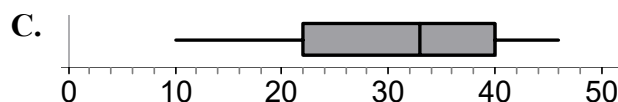
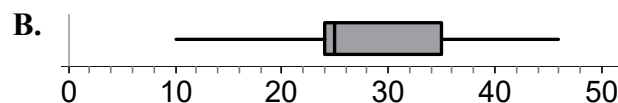
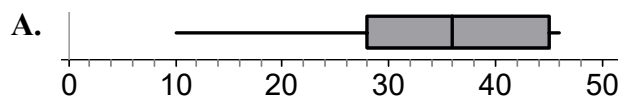
A. $\begin{bmatrix} 2 & 1 \\ 2 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 1 \\ 2 & 11 \end{bmatrix}$

C. $\begin{bmatrix} 2 & -3 \\ 2 & -1 \end{bmatrix}$

D. $\begin{bmatrix} 6 & -3 \\ 12 & -1 \end{bmatrix}$

3. Which box-and-whisker plot below represents the following set of data: {10, 14, 22, 28, 32, 34, 36, 40, 45, 46}?



4. There are 20 equally-sized sections on a spinner. There are 6 blue sections, 3 yellow sections, 9 red sections and 2 green sections. What is the probability of the spinner landing in a blue or yellow section on the first spin?

A. $\frac{1}{10}$

B. $\frac{3}{20}$

C. $\frac{3}{10}$

D. $\frac{9}{20}$

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5. There are 5 blue socks, 3 red socks, and 2 green socks in a drawer. What is the probability of randomly choosing one blue sock, then one red sock, without putting the blue sock back first?

- A. $\frac{3}{20}$
- B. $\frac{1}{2}$
- C. $\frac{1}{4}$
- D. $\frac{1}{6}$

6. Simplify the expression:

$$3 \cdot 4^2 - [24 \div (6 - 4)].$$

- A. 12
- B. 36
- C. 48
- D. 132

7. Evaluate the expression

$$4 + 2^3 [x \div 3(x - 6)] \text{ when } x = 9.$$

- A. 12
- B. 76
- C. 90
- D. 108

8. Evaluate the expression $3x - 5y + 7$ when

$$x = \frac{4}{3} \text{ and } y = 2.$$

- A. -13
- B. -5
- C. 1
- D. 9

9. Find the equation that matches the pattern represented in the table:

x	0	1	2	3	4
y	10	21	32	43	54

- A. $y = x + 10$
- B. $y = x + 11$
- C. $y = 2x + 11$
- D. $y = 11x + 10$

10. Simplify the expression $8 + 5(x + 3) - 2x$.

- A. $3x + 11$
- B. $7x + 11$
- C. $3x + 23$
- D. $-7x + 23$

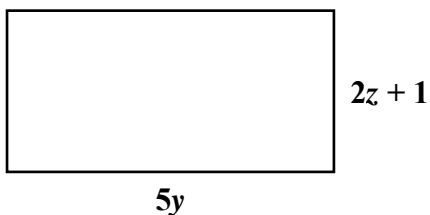
11. Simplify the expression

$$10x^2 - 8x + 20 + 3x + 4x^2 - 8.$$

- A. $14x^2 - 5x + 12$
- B. $13x^2 - 4x + 12$
- C. $14x^2 - 11x + 12$
- D. $2x^2 + 7x + 12$

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12. Write an expression for the perimeter of the rectangle:



- A. $10yz + 5y$
- B. $10y + 4z + 2$
- C. $7yz + 1$
- D. $14yz + 2$

13. Which of the following tables represent functions?

I.

Input	Output
1	4
2	3
3	2
4	1

II.

Input	Output
1	1
2	2
3	□3
3	□4

III.

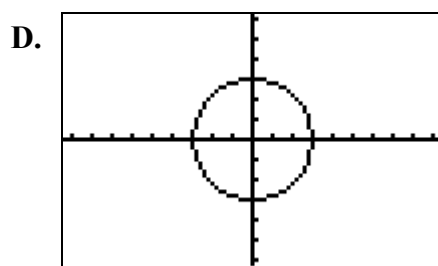
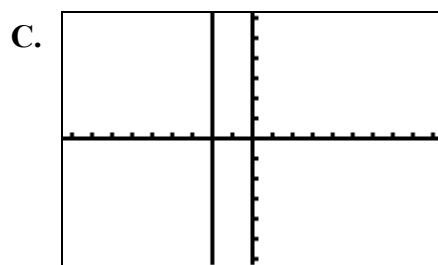
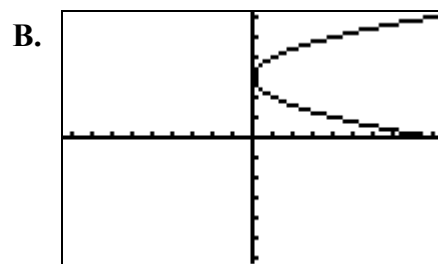
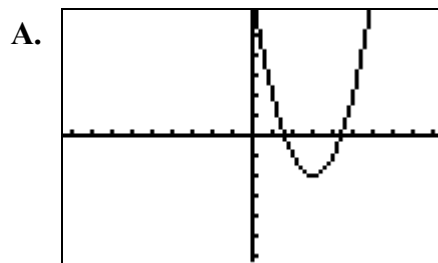
Input	Output
-1	2
0	2
1	3
5	3

IV.

Input	Output
-4	3
0	1
2	12
4	7

- A. II only
- B. I and IV only
- C. III and IV only
- D. I, III, and IV only

14. Which graph below represents a function?



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15. Which input-output table represents the function $f(x) = 5x - 4$?

A.

Input	Output
2	-10
3	-5
6	10
8	20

B.

Input	Output
2	6
3	11
6	16
8	21

C.

Input	Output
2	6
3	11
6	26
8	36

D.

Input	Output
2	14
3	19
6	34
8	44

16. For $f(x) = -2x^2 + 4x - 1$, what is $f(3)$?

- A. -29
- B. -7
- C. -1
- D. 17

17. Translate the table into words:

Input	3	4	5	6	7
Output	5	7	9	11	13

- A. The output is four less than triple the input.
- B. The output is one less than double the input.
- C. The output is one greater than double the input.
- D. The output is two greater than the input.

18. Which sentence represents the equation $y = 2x + 5$, where y represents Karla's age and x represents the age of her cousin?

- A. Karla's age is 2 years older than 5 times the age of her cousin.
- B. Karla's age is 2 years younger than 5 times the age of her cousin.
- C. Karla's age is 5 years older than twice the age of her cousin.
- D. Karla's age is 5 years younger than twice the age of her cousin.

19. What is the domain of the following function? $\{(-3, 1), (-2, 7), (4, 2), (2, 5)\}$

- A. $\{-3 \leq x \leq 4\}$
- B. $\{1 \leq x \leq 7\}$
- C. $\{1, 2, 5, 7\}$
- D. $\{-3, -2, 2, 4\}$

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20. Solve the equation $64 = 3x + 22$ for x .

- A. $x = 14$
- B. $x = 21.33$
- C. $x = 24$
- D. $x = 28.67$

21. Solve $4x - 2 + 5x = -29$ for x .

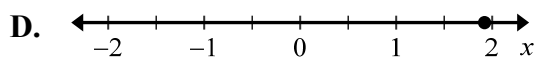
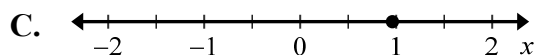
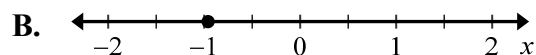
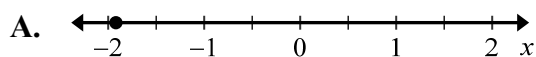
- A. -27
- B. -3
- C. 3
- D. 27

22. Solve the equation

$$4(3x - 4) + 2 = -2(-6x + 1) \text{ for } x.$$

- A. $x = \frac{2}{3}$
- B. $x = 1$
- C. No solution
- D. Infinitely many solutions

23. Which graph represents the solution of $2.5x + 1.2 = -3.6$?



24. Solve the equation $A = 2\pi rh + 2\pi r^2$ for the variable h .

- A. $h = A - 4\pi r^2$
- B. $h = A - r$
- C. $h = \frac{A - \pi r^2}{\pi r}$
- D. $h = \frac{A - 2\pi r^2}{2\pi r}$

25. Hope uses the equation $C = 3h + 9$ to find the total cost, C , in dollars, of renting a bike for h hours. Hope cannot spend more than \$30. What is the maximum number of hours she can rent the bike?

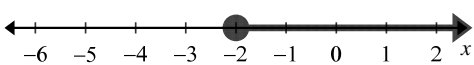
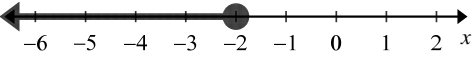
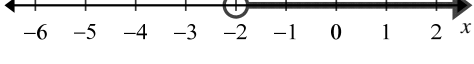
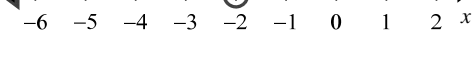
- A. 7
- B. 10
- C. 13
- D. 18

26. The number of cars in the student parking lot is 384, which is 12 more than 3 times the number of cars in the teacher parking lot. How many cars are in the teacher parking lot?

- A. 124
- B. 132
- C. 348
- D. 372

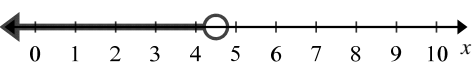
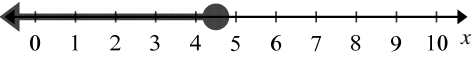
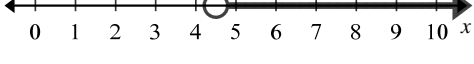
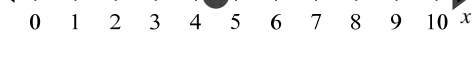
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27. Which graph below illustrates the inequality $x \leq -2$?

- A. 
- B. 
- C. 
- D. 

28. Graph the solution to the inequality:

$$4x - 3 \geq 2(x + 3)$$

- A. 
- B. 
- C. 
- D. 

29. What is the solution set of $|8x - 3| = 13$?

- A. $\left\{-2, \frac{5}{4}\right\}$
- B. $\left\{-\frac{5}{4}, 2\right\}$
- C. $\left\{\frac{5}{4}\right\}$
- D. $\{2\}$

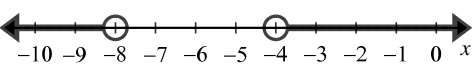
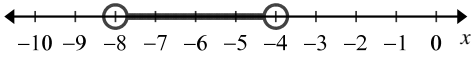
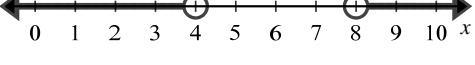
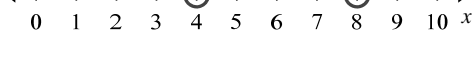
30. Solve the compound inequality:

$$6n - 5 < -35 \text{ or } -10n + 1 < -59$$

- A. $-6 < n < 5$
- B. $-5 < n < 6$
- C. $n < -5$ or $n > 6$
- D. $n < -6$ or $n > 5$

31. Which graph below represents the solution to the inequality below?

$$-38 < 10 - 6k < -14$$

- A. 
- B. 
- C. 
- D. 

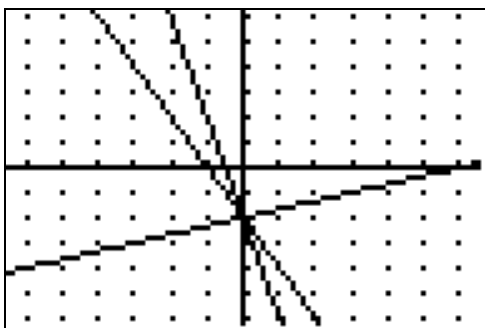
32. Solve the inequality below for x :

$$|3x - 5| < 6$$

- A. $x < -\frac{11}{3}$ or $x > \frac{1}{3}$
- B. $-\frac{11}{3} < x < \frac{1}{3}$
- C. $x < -\frac{1}{3}$ or $x > \frac{11}{3}$
- D. $-\frac{1}{3} < x < \frac{11}{3}$

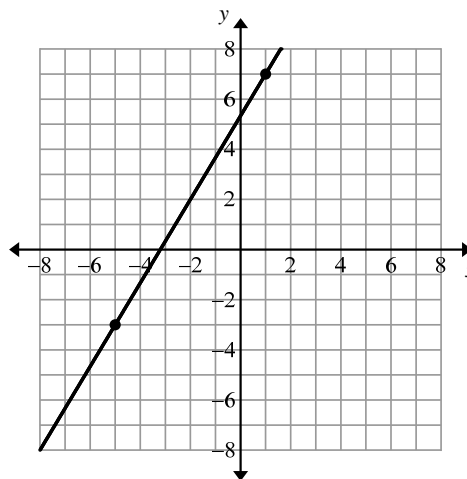
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33. What do the following lines have in common?



- A. They have the same x -intercept.
 B. They have the same y -intercept.
 C. They have the same slope.
 D. They are the same function.
34. Which statement about the comparison between the graphs of $y = 2x - 1$ and $y = 5x - 1$ is correct?
- A. The graph of $y = 5x - 1$ is steeper than the graph of $y = 2x - 1$
 B. The graph of $y = 5x - 1$ is less steep than the graph of $y = 2x - 1$
 C. The graph of $y = 5x - 1$ is shifted 3 units up from the graph of $y = 2x - 1$
 D. The graph of $y = 5x - 1$ is shifted 3 units down from the graph of $y = 2x - 1$

35. Find the slope of the line in the graph.



- A. $\frac{3}{5}$
 B. $\frac{2}{3}$
 C. $\frac{3}{2}$
 D. $\frac{5}{3}$
36. What is the slope of the line that passes through the points $(4, 6)$ and $(-4, 9)$?
- A. $-\frac{3}{8}$
 B. 0
 C. $-\frac{8}{3}$
 D. Undefined

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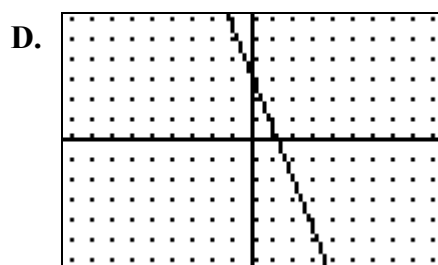
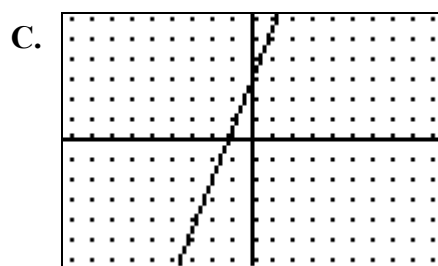
37. What is the slope of the line that passes through the points $(3, -1)$ and $(5, -1)$?

- A. 0
- B. 2
- C. -2
- D. undefined

38. What are the intercepts of the graph of the equation $5x + 4y = 12$?

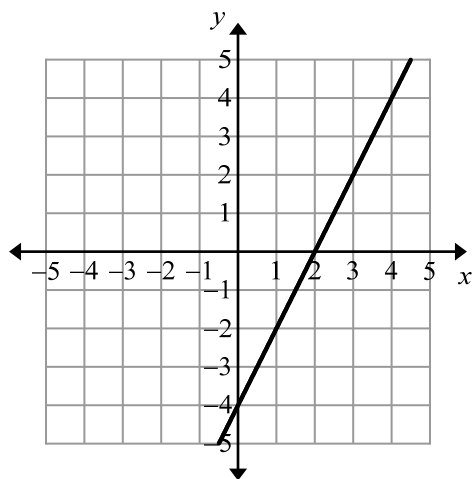
- A. x -intercept = $\frac{12}{5}$, y -intercept = 4
- B. x -intercept = 5, y -intercept = 4
- C. x -intercept = $\frac{12}{5}$, y -intercept = 3
- D. x -intercept = 5, y -intercept = 3

39. Which graph best represents the equation $y = \frac{2}{5}x + 3$? (Assume the scales on both axes are one unit per tick mark.)



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40. Use the graph below.



What is the equation of the line in the graph?

- A. $-2x - 4y = 8$
- B. $-4x + 2y = 8$
- C. $2x - 4y = 8$
- D. $4x - 2y = 8$

41. Rewrite the following equation in standard form:

$$y - 8 = \frac{1}{2}(x + 6)$$

- A. $x - 2y = -11$
- B. $x - 2y = -14$
- C. $x - 2y = -22$
- D. $2x - 2y = -28$

42. Rewrite the following equation in slope-intercept form:

$$6x - 7y = -84$$

- A. $y = \frac{6}{7}x + 12$
- B. $y = \frac{6}{7}x - 12$
- C. $y = -\frac{6}{7} + 12$
- D. $y = -\frac{6}{7} - 12$

43. Which equation below, in point-slope form, represents the line that passes through the point $(-1, 2)$ with a slope of 3?

- A. $y - 1 = 3(x + 2)$
- B. $y + 1 = 3(x - 2)$
- C. $y - 2 = 3(x + 1)$
- D. $y + 2 = 3(x - 1)$

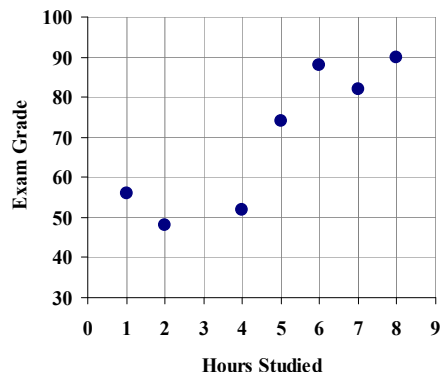
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44. What is the equation of the line in slope-intercept form passing through the points in the table?

x	-3	0	3	6	9
y	2.5	2	1.5	1	0.5

- A. $y = -\frac{1}{6}x + 2$
- B. $y = -\frac{1}{6}x - 2$
- C. $y = -\frac{1}{3}x - 2$
- D. $y = -\frac{1}{3}x + 2$
45. Which line is parallel to the line $y = 3x - 4$?
- A. $y = 4x + 2$
- B. $y = 3x + 2$
- C. $y = -\frac{1}{3}x + 2$
- D. $y = -\frac{1}{4}x + 2$
46. Which equation represents the line that contains the point (0,4) and is perpendicular to the line represented by $y = 3x + 2$?
- A. $y = 3x + 4$
- B. $y = -\frac{1}{3}x + 4$
- C. $y = 3x + 2$
- D. $y = -\frac{1}{3}x + 2$

47. The scatterplot below shows the times seven students studied for their final exam and their grades on that exam.

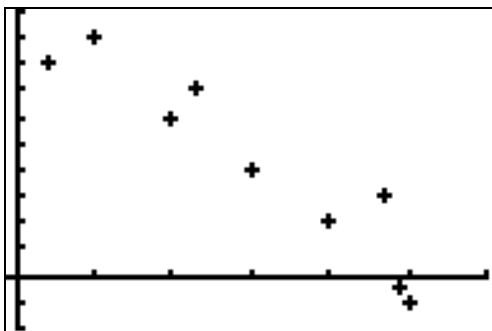


Based on a linear relationship between the variables, what is the best prediction of the final exam grade for a student who studies for 3 hours?

- A. 40
- B. 50
- C. 60
- D. 70

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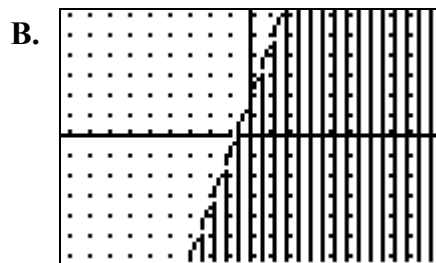
48. Use the scatterplot below. Assume the scales on each axis are one unit per tick mark.



Which of the equations would most accurately represent the line of best fit for the data?

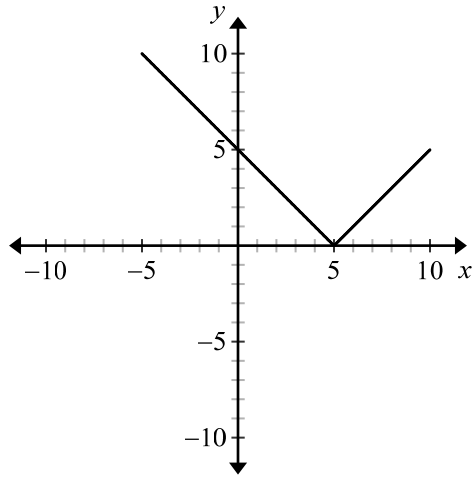
- A. $y = -2x + 10$
- B. $y = 2x + 10$
- C. $y = -2x - 10$
- D. $y = 2x - 10$

49. Which graph correctly represents $-3y < 8x - 6$? (Assume the scales on both axes are one unit per tick mark.)



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50. Use the graph below.



What is the equation of the function?

- A. $y = |x| - 5$
- B. $y = |x| + 5$
- C. $y = |x - 5|$
- D. $y = |x + 5|$

**Algebra I Semester 1 Practice Exam
Free Response**

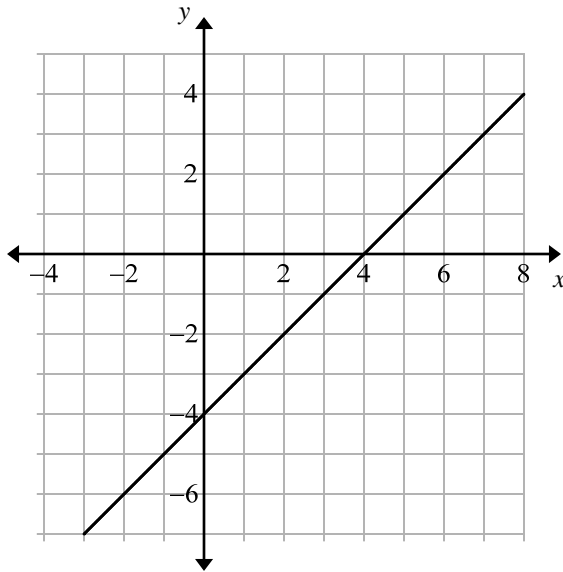
1. Justify each step used to solve the algebraic equation $4 - 10x = 5x + 2(3x - 5)$.

List each step

Justification for each step

Algebra I Semester 1 Practice Exam Free Response

2. Use the following graph to answer the questions below.



A. Complete the table of values below:

x	-2	1	4	7
y				

B. According to the table and graph above, is this relation a function? Justify your answer.

C. Model the graph with a linear equation in function notation.

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3. Sam rented a moving truck for a \$45.00 fee and an additional \$0.35 per mile driven.

A. Write a linear equation to model the cost (C) for the number of miles driven (m).

B. Sam paid \$59.00 when he returned the truck. How many miles did he drive?

C. How would the graph of the cost equation from Part A look different from the graph of $C = 0.7m + 55$? What would this mean in the context of the rental truck problem?

