



NAME _____

Module 9 Using Functions
Lesson 1 Defining Relations and Functions

Find the domain and range of each relation.

1. $W = \{(0, 2), (0, 1), (4, 3), (5, 2), (2, 0)\}$

Domain = $\{0, 2, 4, 5\}$ _____

Range = $\{0, 1, 2, 3\}$ _____

2. $M = \{(-1, 1), (-6, 3), (4, 5), (0, 5), (-2, 3)\}$

Domain = $\{-6, -2, -1, 0, 4\}$ _____

Range = $\{1, 3, 5\}$ _____

3.

| x | y |
|---|---|
| 0 | 1 |
| 0 | 2 |
| 0 | 5 |
| 0 | 8 |

Domain = $\{0\}$ _____

Range = $\{1, 2, 5, 8\}$ _____

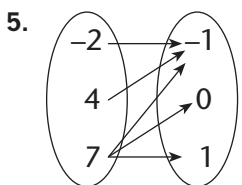
4.

| x | y |
|----|----|
| 3 | -1 |
| -1 | 3 |
| 3 | 0 |
| 0 | -1 |

Domain = $\{-1, 0, 3\}$ _____

Range = $\{-1, 0, 3\}$ _____

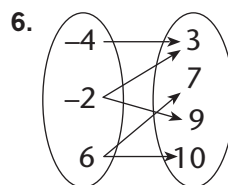
Name the ordered pairs shown by each mapping diagram. Then, name the domain and range of each relation.



$(-2, -1), (4, -1), (7, -1), (7, 0), (7, 1)$ _____

Domain = $\{-2, 4, 7\}$ _____

Range = $\{-1, 0, 1\}$ _____



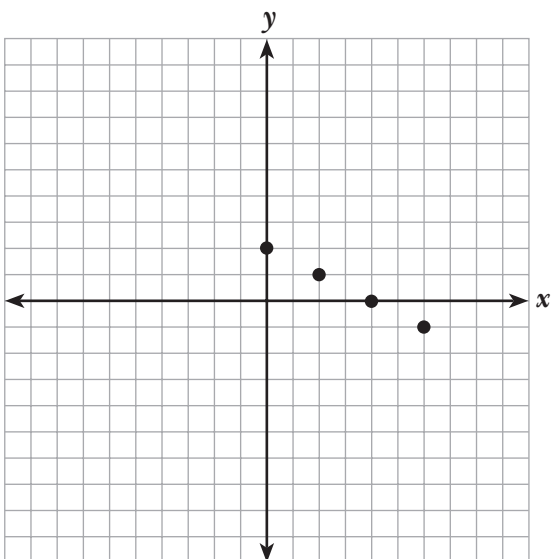
$(-4, 3), (-2, 3), (-2, 9), (6, 7), (6, 10)$ _____

Domain = $\{-4, -2, 6\}$ _____

Range = $\{3, 7, 9, 10\}$ _____

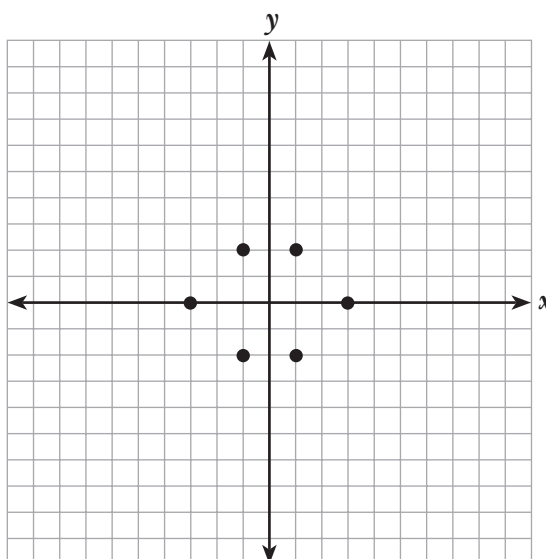
Find the domain and range of each relation.

7.



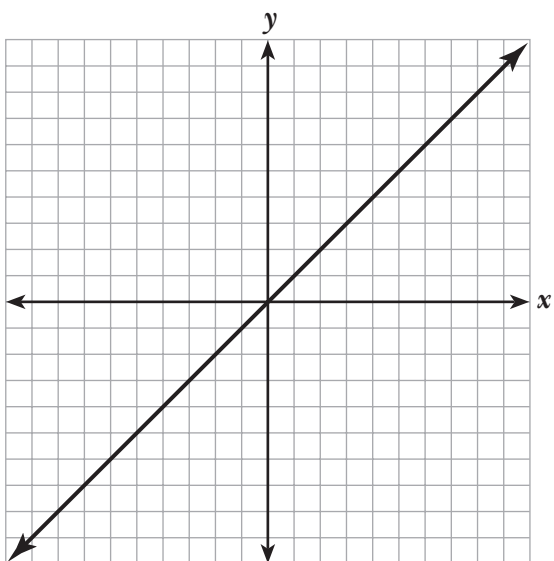
Domain = {0, 2, 4, 6}; Range = {-1, 0, 1, 2}

8.



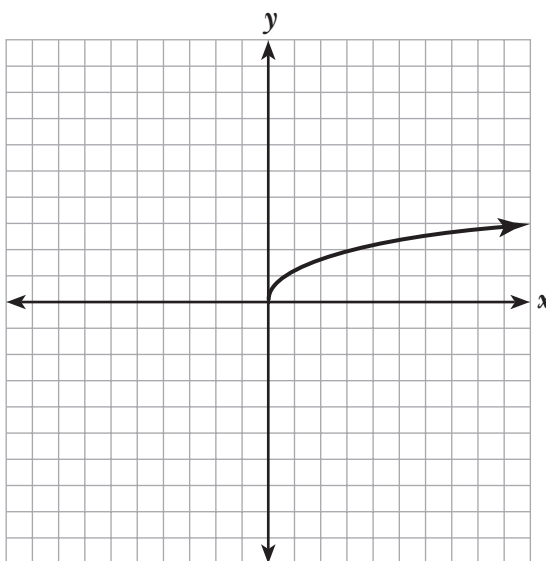
Domain = {-3, -1, 1, 3}; Range = {-2, 0, 2}

9. $y = x$



Domain = \mathcal{R} ; Range = \mathcal{R}

10. $y = \sqrt{x}$



Domain = $\{x: x \geq 0\}$; Range = $\{y: y \geq 0\}$

Determine whether each relation is a function. If the relation is not a function, justify your answer.

11. $K = \{(3, 1), (0, 5), (3, -5), (1, -1), (5, 1)\}$

K is not a function. The x-coordinate 3 is mapped to 2 different y-coordinates.

12. $B = \{(-3, 0), (-2, 0), (-4, -9), (-10, 0)\}$

B is a function.

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13.

| x | y |
|---|---|
| 0 | 1 |
| 0 | 2 |
| 0 | 5 |
| 0 | 8 |

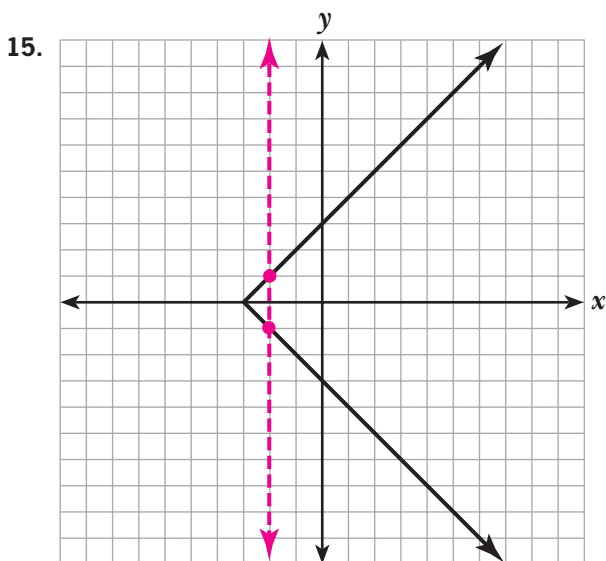
The relation is not a function.
The x-coordinate 0 is mapped
to 4 different y-coordinates.

14.

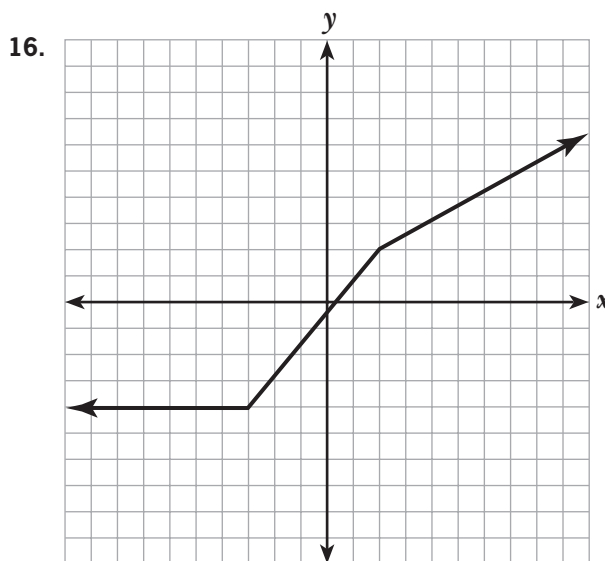
| x | y |
|----|----|
| 3 | -1 |
| -1 | 3 |
| 3 | 0 |
| 0 | -1 |

The relation is not a function.
The x-coordinate 3 is mapped
to 2 different y-coordinates.

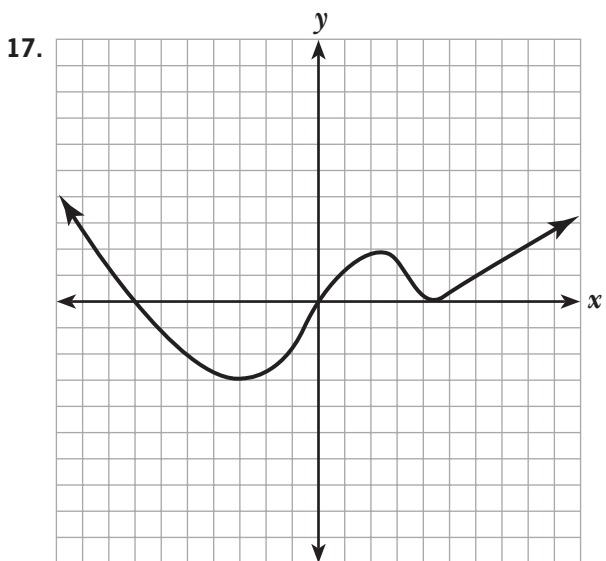
Use the vertical line test to determine whether each graph represents a function.



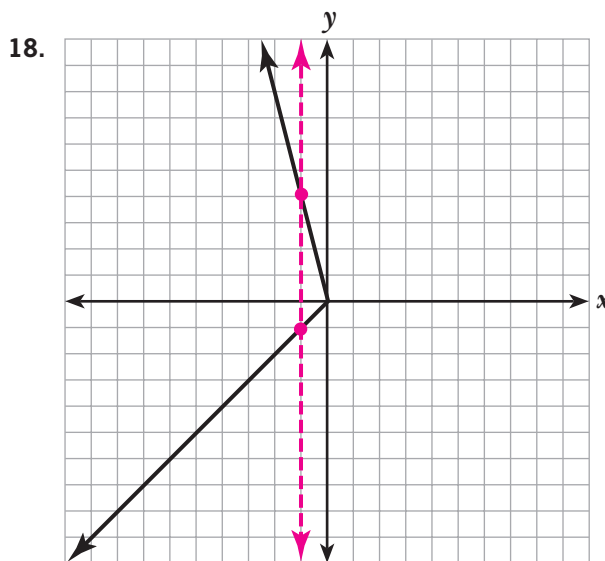
The graph does not represent a function.



The graph represents a function.



The graph represents a function.



The graph does not represent a function.

