

# 2-1 Study Guide and Intervention

## Relations and Functions

**Graph Relations** A **relation** can be represented as a set of ordered pairs or as an equation; the relation is then the set of all ordered pairs  $(x, y)$  that make the equation true. The **domain** of a relation is the set of all first coordinates of the ordered pairs, and the **range** is the set of all second coordinates.

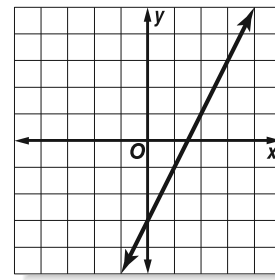
A **function** is a relation in which each element of the domain is paired with exactly one element of the range. You can tell if a relation is a function by graphing, then using the **vertical line test**. If a vertical line intersects the graph at more than one point, the relation is not a function.

**Example** Graph the equation  $y = 2x - 3$  and find the domain and range. Is the equation discrete or continuous? Does the equation represent a function?

Make a table of values to find ordered pairs that satisfy the equation. Then graph the ordered pairs.

The domain and range are both all real numbers. The equation can be graphed by line, so it is continuous. The graph passes the vertical line test, so it is a function.

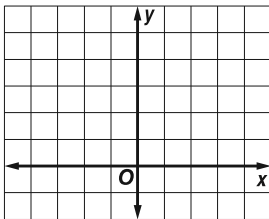
x	y
-1	-5
0	-3
1	-1
2	1
3	3



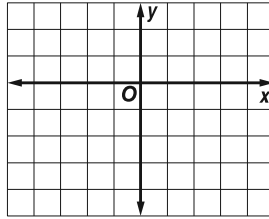
### Exercises

Graph each relation or equation and find the domain and range. Next determine if the relation is discrete or continuous. Then determine whether the relation or equation is a function.

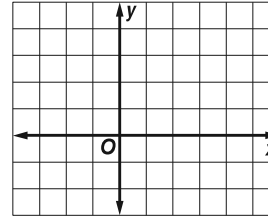
1.  $\{(1, 3), (-3, 5), (-2, 5), (2, 3)\}$



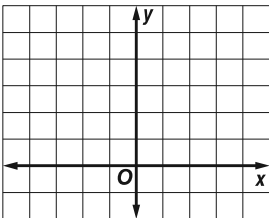
2.  $\{(3, -4), (1, 0), (2, -2), (3, 2)\}$



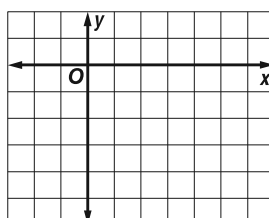
3.  $\{(0, 4), (-3, -2), (3, 2), (5, 1)\}$



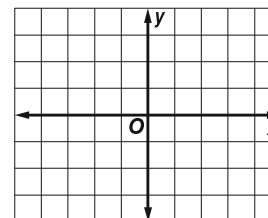
4.  $y = x^2 - 1$



5.  $y = x - 4$



6.  $y = 3x + 2$

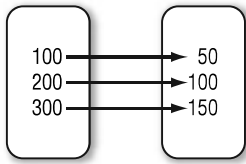


# 2-1 Skills Practice

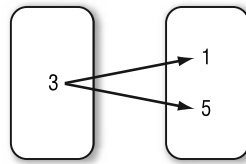
## Relations and Functions

Determine whether each relation is a function. Write *yes* or *no*.

1. Domain Range



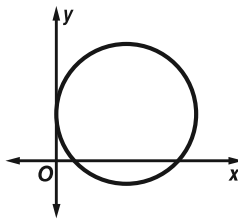
2. Domain Range



3.

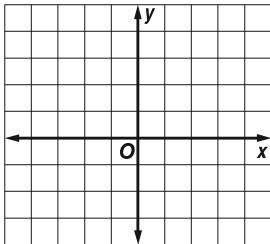
x	y
1	2
2	4
3	6

4.

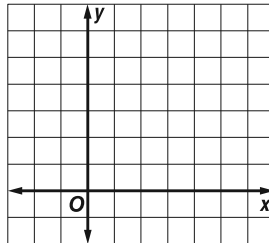


Graph each relation or equation and find the domain and range. Next determine if the relation is discrete or continuous. Then determine whether the relation or equation is a function.

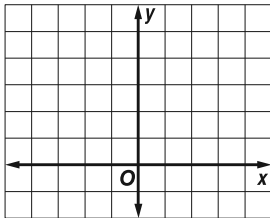
5.  $\{(2, -3), (2, 4), (2, -1)\}$



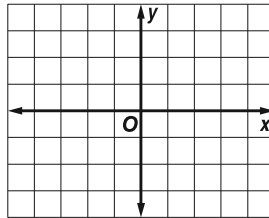
6.  $\{(2, 6), (6, 2)\}$



7.  $\{(-3, 4), (-2, 4), (-1, -1), (3, -1)\}$



8.  $x = -2$



Find each value if  $f(x) = 2x - 1$  and  $g(x) = 2 - x^2$ .

9.  $f(0)$

10.  $f(12)$

11.  $g(4)$

12.  $f(-2)$

13.  $g(-1)$

14.  $f(d)$