

## Section 0-1 Representing Functions

A **Relation** is a set of ordered pairs.

The **domain** of a relation is the set of all first coordinates (x-coordinates) from the ordered pairs, and the **range** is the set of all second coordinates (y-coordinates) from the ordered pairs.

State the domain and the range of the relation.

$\{(-3, 3), (0, -7), (1, -5), (2, 4)\}$   $(-3, 4)$

$D: \{ -3, 0, 1, 2 \}$

$R: \{ 3, -7, -5, 4 \}$

State the domain and range of the relation.

$\{(-2, -1), (-1, 0), (1, -5), (2, 7)\}$

$D: \{ -2, -1, 1, 2 \}$

$R: \{ -1, 0, -5, 7 \}$

A relation can also be represented by a table or a mapping. A **mapping** illustrates how each element of the domain is paired with an element in the range.

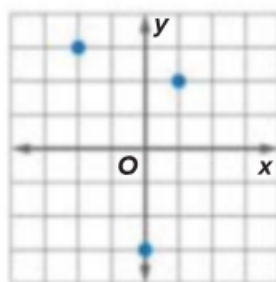
Ordered Pairs

- (1, 2)
- (-2, 3)
- (0, -3)

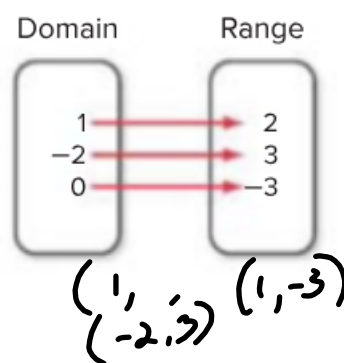
Table

x	y
1	2
-2	3
0	-3

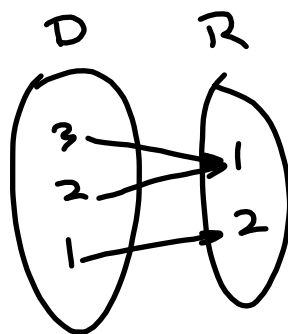
Graph



Mapping



A **function** is a relation in which each element of the domain is paired with *exactly one* element of the range.



State the domain and range of each relation. Then determine whether each relation is a function.

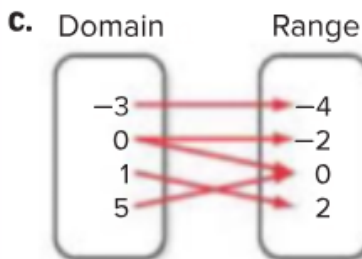
a.  $\{(10, 3), (6, -2), (7, 4), (-8, -9)\}$

NO Repeats in Domain It is a function

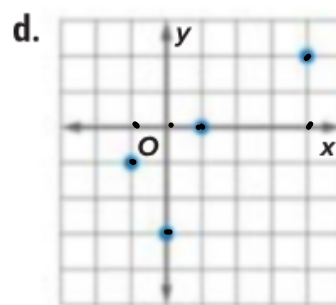
b. *NOT Function*

x	y
1	3, 4
2	7
3	4

$D: \{1, 2, 3\}$   
 $R: \{3, 4, 7\}$



*NO Function*



*Function*

State the domain and range of each relation. Then determine whether each relation is a function. Write *yes* or *no*.

1.  $\{(2, 7), (3, 10), (1, 6)\}$

2.  $\{(-6, 0), (5, 5), (9, -2), (-2, -9)\}$

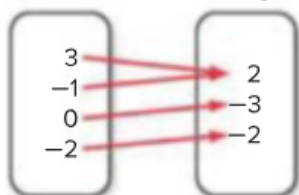
3.

x	y
1	5
2	7
1	9

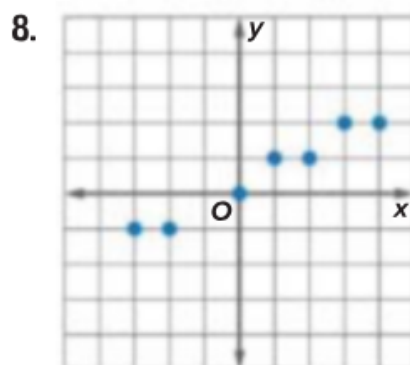
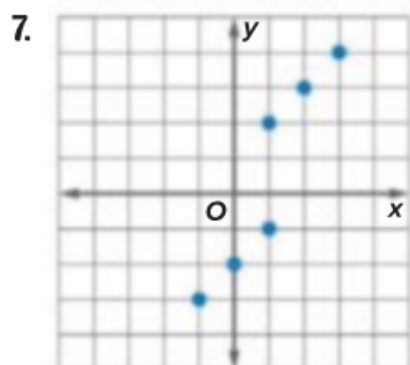
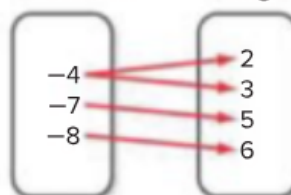
4.

x	y
-12	0
-10	1
-8	2
-6	4

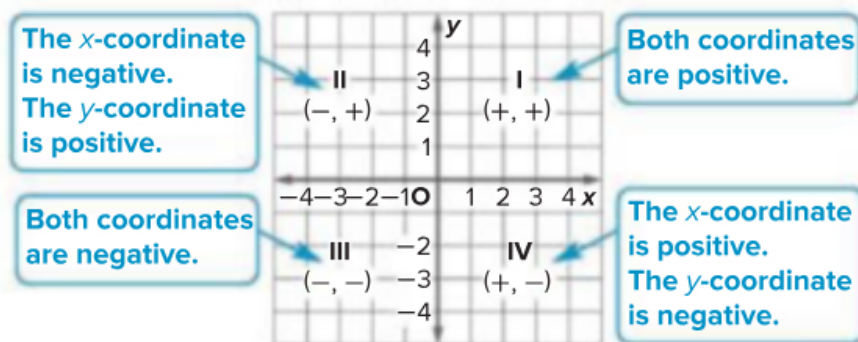
5. Domain                  Range



6. Domain                  Range



A relation can be graphed on a coordinate plane. A coordinate plane is formed by the intersection of the horizontal axis, or  $x$ -axis, and the vertical axis, or  $y$ -axis. The axes meet at the origin  $(0, 0)$  and divide the plane into four **quadrants**. Any ordered pair in the coordinate plane can be written in the form  $(x, y)$ .



Name the quadrant in which  $T(-8, 5)$  is located.

Name the quadrant in which each point is located.

9.  $(5, 3)$

10.  $(8, -6)$

11.  $(2, 0)$

12.  $(-7, -1)$