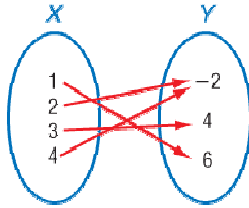


## Lesson 2-2

## Example 1

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

a.



b.

<b>x</b>	-2	-1	0	3
<b>y</b>	4	1	0	9

c.  $\{(1, 4), (2, 6), (2, 8), (4, 12)\}$ 

## Solution

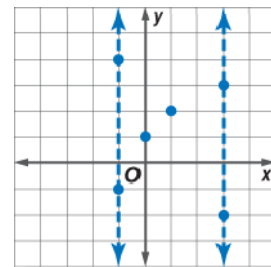
- a. Yes; each element of the domain is paired with exactly one element of the range. However, you will note that one element of the range can be paired with more than one element of the domain. Domain:  $\{1, 2, 3, 4\}$ , Range:  $\{-2, 4, 6\}$
- b. Yes; Domain:  $\{-2, -1, 0, 3\}$ , Range:  $\{4, 1, 0, 9\}$
- c. No; The element 2 in the domain is paired with two elements in the range, 6 and 8. Domain:  $\{1, 2, 4\}$ , Range:  $\{4, 6, 8, 12\}$

## Example 2

Determine whether  $\{(1, 2), (-1, 4), (3, -2), (-1, -1), (3, 3)\}$ , is a function by using the vertical line test.

## Solution

The relation is not a function. A vertical line passes through more than one point.



**Example 3**

Evaluate each function.

a.  $f(x) = 2x + 3; f(-8)$

b.  $f(x) = 4 + x^2; f(-5)$

**Solution**

a.  $f(-8) = 2(-8) + 3$   
 $= -16 + 3$   
 $= -13$

b.  $f(-5) = 4 + (-5)^2$   
 $= 4 + 25$   
 $= 29$

**Example 4**

**ENGINEERING** The air conditioner in a car should produce air that is 25 degrees below the temperature outside the car. The formula for this function is  $T(x) = x - 25$ , where  $x$  is the outside air temperature. What is the temperature inside a car when temperature outside the car is  $95^\circ\text{F}$ ?

**Solution**

$T(95) = 95 - 25 = 70$  The temperature is  $70^\circ$  inside the car.