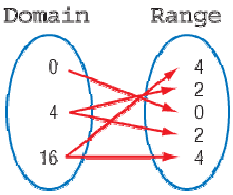
Lesson 7-3

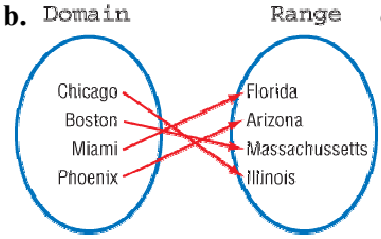
Example 1

Does the mapping show that the relation is a function?

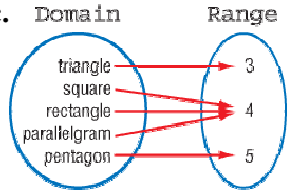
a.



b.



c.



Solution

a. Not a function. The domain values 4 and 16 are each paired with more than one range value.

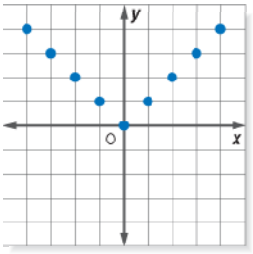
b. Function. Each city is paired with one and only one state.

c. Function. Each shape is paired with one and only one number, which represents its number of sides.

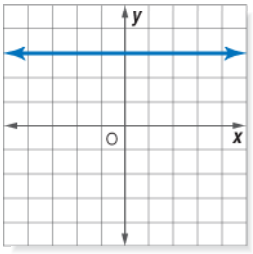
Example 2

Use the vertical line test to determine if each relation is a function.

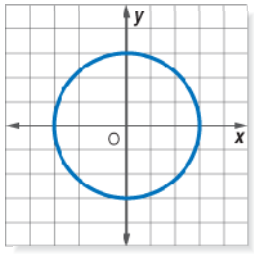
a.



b.

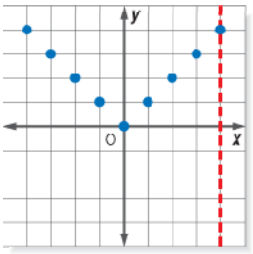


c.



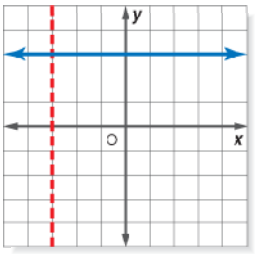
Solution

a.



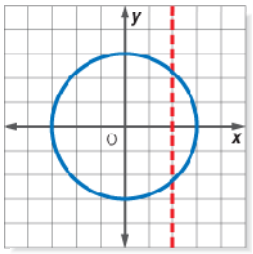
This is a function.
Any vertical line will intersect the graph of the relation at only one point.

b.



This is a function.
Any vertical line will intersect the graph of the relation at only one point.

c.



This is a not a function.
The vertical line intersects the graph of the relation at two points.

Example 3

Use the relation to determine the following.

{(16, –2), (1, –1), (0, 0), (1, 1), (16, 2)}

a. domain **b.** range **c.** Is the relation a function?

Solution

a. domain: {0, 1, 16} **b.** range: {–2, –1, 0, 1, 2}

c. No, this relation is not a function since two of the values in the domain, 1 and 16, each have two values in the range.

Example 4

FITNESS A health club charges a basic monthly membership fee of \$55 for one person, plus \$25 for each additional member from the same household. This is represented by the function $f(x) = 55 + 25(x - 1)$ where x is the number of members in a household and $f(x)$ is the monthly membership fee for the household.

a. Evaluate $f(x)$ to find the monthly fee for households in which 1, 2, 3, and 4 members join the health club.

b. In the Leoni household, 3 people joined the health club. What will be their total membership fee for 6 mo?

Solution

a. Set up a table to represent a function.

x	$f(x)$
1	55 + 25(0) = 55
2	55 + 25(1) = 80
3	55 + 25(2) = 105
4	55 + 25(3) = 130

b. For 3 people, the monthly fee is \$105. So, for 6 mo, the total fee will be $6 \cdot \$105 = \$630$.