

Name: _____

Date: _____

3.1 Functions

Essential Question: _____

Relation: Set of _____ and _____ (set of _____ pairs)

Function: Is a _____ that pairs each _____ with exactly one _____

EXAMPLE 1 Determining Whether Relations Are Functions

Determine whether each relation is a function. Explain.

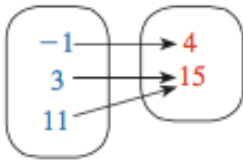
a. $(-2, 2), (-1, 2), (0, 2), (1, 0), (2, 0)$

b. $(4, 0), (8, 7), (6, 4), (4, 3), (5, 2)$

c.

| | | | | | | |
|-------------|----|----|---|---|---|---|
| Input, x | -2 | -1 | 0 | 0 | 1 | 2 |
| Output, y | 3 | 4 | 5 | 6 | 7 | 8 |

d. Input, x Output, y

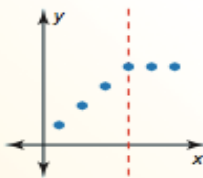


Core Concept

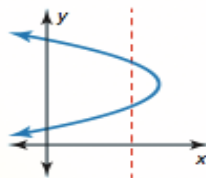
Vertical Line Test

Words A graph represents a function when no vertical line passes through more than one point on the graph.

Examples Function



Not a function



Example 2 Using Vertical Line Test

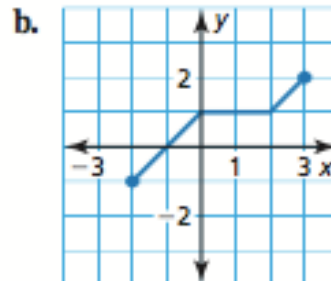
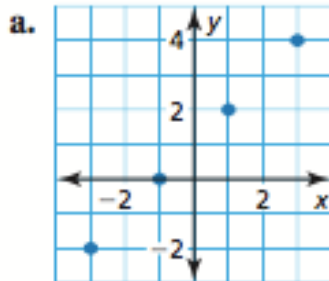
Four coordinate planes are shown, each with a graph. The top-left graph shows a discrete set of points: (1,0), (2,2), (2,4), (4,1), (5,1), (5,3). The top-right graph shows a straight line with a positive slope. The bottom-left graph shows a V-shaped graph opening upwards. The bottom-right graph shows a circle. A vertical dashed line is drawn through the circle, intersecting it at two points.

Domain and Range of a Function

Domain: set of _____ (___-values) Range: set of _____ (___- values)

EXAMPLE 3 Finding the Domain and Range from a Graph

Find the domain and range of the function represented by the graph.



How to determine X or Y

Independent variable: _____, x, domain

Dependent variable: output, y, _____ (because it _____ on the input)

“y is a function of x” \rightarrow y varies _____ on x

$$y = -x + 10$$

EXAMPLE 4 Identifying Independent and Dependent Variables

The function $y = -3x + 12$ represents the amount y (in fluid ounces) of juice remaining in a bottle after you take x gulps.

- Identify the independent and dependent variables.
- The domain is 0, 1, 2, 3, and 4. What is the range?