

## Lesson 25 Differentiating Between Relations and Functions

**domain-** Is the set of possible values for the independent variable (x values)

**range-** is the set of all values for the dependent variable (y values)

**relation-** any set of ordered pairs

Examples:

- a) Give the domain and range of the relation.

$\{(2,6), (2,10), (8,6), (5,1), (4,6), (3,9)\}$

$$D = \{2, 3, 4, 5, 8\}$$

$$R = \{1, 6, 9, 10\}$$

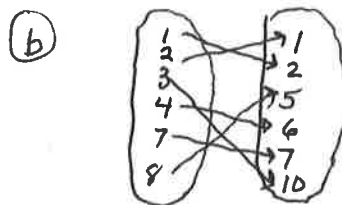
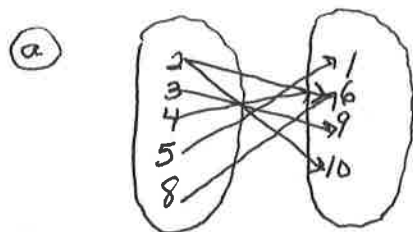
- b) Give the domain and range of the relation.

$\{(1,2), (2,1), (4,6), (8,5), (7,7), (3,10)\}$

$$D = \{1, 2, 3, 4, 7, 8\}$$

$$R = \{1, 2, 5, 6, 7, 10\}$$

- c) Using examples a and b, make a mapping diagram of each relation.

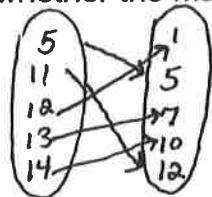


A **function** is a mathematical relationship pairing each value in the domain with exactly one value in the range.

- d) Determine whether  $\{(3,3), (10,1), (0,3), (8,9), (4,4), (10,2)\}$  represents a function.

no because  $(10,1)$   $(10,2)$

- e) Determine whether the mapping diagram represents a function.



yes, all x values have only one y value

- f) Determine whether  $y = 3x - 1$  represents a function.

yes, it is an oblique line. All oblique lines are functions

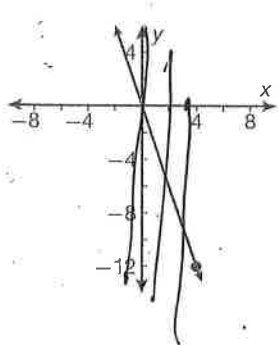
- g) Determine whether  $y = \frac{1}{2}x - 1$  represents a function.

Yes, oblique line

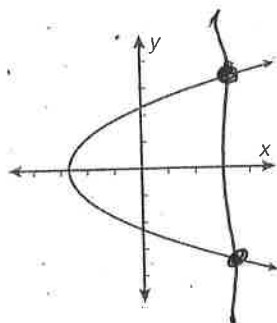
### Vertical Line Test

A graph on the coordinate plane represents a function if any vertical line intersects the graph in exactly one point.

- h) Do each of the following graphs represent a function?



yes



no, intersects at 2 different points

- i) Write  $x + 2y = 5$  in function form.

$$\frac{-x}{2} = \frac{-x}{2} + \frac{5}{2}$$

$$\frac{2y}{2} = \frac{-x}{2} + \frac{5}{2}$$

$$y = -\frac{1}{2}x + \frac{5}{2} \quad f(x) = -\frac{1}{2}x + \frac{5}{2}$$

① solve for "y"

② replace y with f(x)

- j) A brochure costs \$0.07 per page to print. Write a rule in function notation to represent the cost of printing c copies of the brochure.

$$y = 0.07c$$

$$f(c) = 0.07c$$

- k) An author writes 30 pages per day. Write a function rule that the author can use to find out how many pages she has left to write before reaching page 400.

$$y = 400 - 30d$$

$$f(d) = 400 - 30d$$