

Relation: A relationship between a set (group) of x's and a set of y's.

Domain: A set of all possible x-values input

Range: A set of all possible y-values. Outputs

Set Notation: $\{-2, 1, 100\}$ * Don't repeat values. put all the #'s in the set

Example 1: Write the domain and range of each relation in set notation.

A. $f = \{(-1, 0), (0, 5), (7, -9)\}$

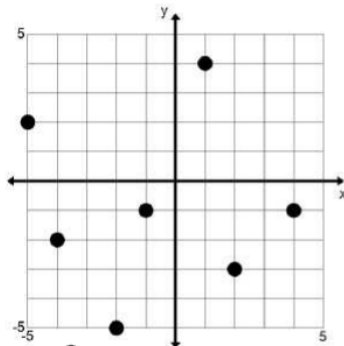
$D = \{-1, 0, 7\}$ $R = \{0, 5, -9\}$

B.

x	y
-1	6
0	9
8	15

$D = \{-1, 0, 8\}$
 $R = \{6, 9, 15\}$

C.



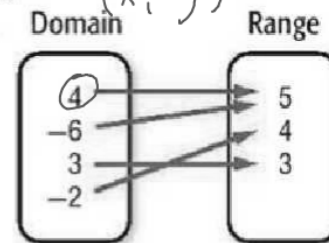
$D = \{-1, 1, -5, -4, -2, 4, 2\}$
 $R = \{-5, -3, -1, -2, 2, 4\}$

Function: A relation where every x (input) has exactly one y (output).

Mapping: example * Don't repeat values

Example 2: Write the following relations as a set of ordered pairs and then determine if it represents a function.

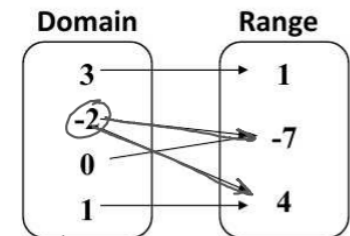
A. (x, y)



$\{(4, 5), (-6, 4), (3, 3), (-2, 3)\}$

Function

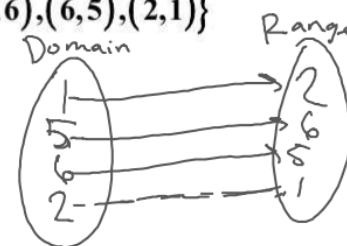
B.



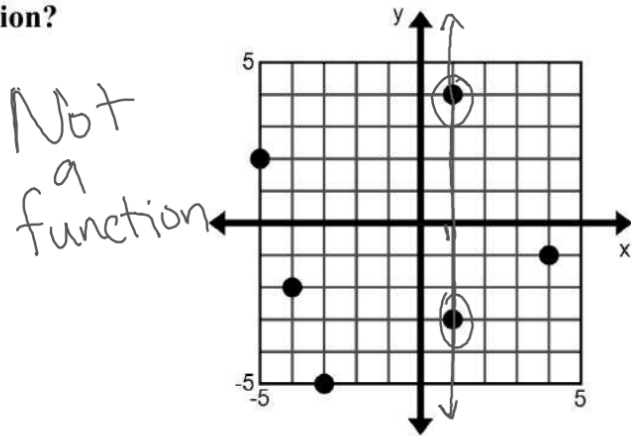
Not a Function

Example 3: Create a mapping for the following and determine if it is a function.

$\{(1, 2), (5, 6), (6, 5), (2, 1)\}$



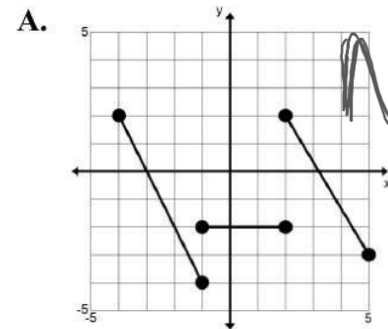
Example 4: Create a mapping for the following relation. Is it a function?



Vertical Line Test:

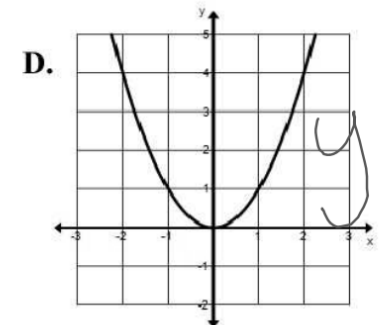
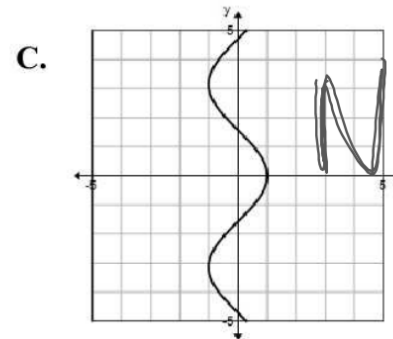
A relation is NOT a function if there is a vertical line that intersects the graph @ 2 or more spots.

Example 5: Determine which of the following relations represent functions.



B.

x	y
-1	6
0	9
8	15
10	6



E. Draw your own example of a graph that is **NOT** a function.

HOW DO YOU CHECK IF IT IS A FUNCTION?

GRAPH
Vertical
line
testTABLE or LIST
two of the
same x with
diff. y 's
Not a functionMAPPING
 2^+ arrows from
the same x Function:Function Notation: $f(x) \rightarrow f$ of x
is a function of x
Dependent: (output, $f(x)$)
the variable that
does depend on the otherIndependent: (x , input)the variable that
does not depend on the otherExample 6: Circle the equations that are correctly in function notation.

$y = 2x + 4$

$f(x) = 3x$

$f = 7x - 9$

$f(x) = 7x - 9$

$g(x) = 2x - 13$

$x = 8y - 13$

$h(x) = 15$

$y = 2x^2$

$f = 5x$

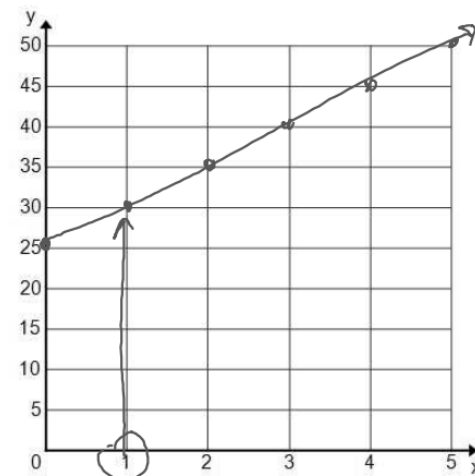
$z(x) = -8x^3$

Example 7: You are saving up money and are going to start doing extra chores each day. You already have \$25 saved and then you are going to earn \$5 a day. Write an equation in **function notation** representing how much money you will have after x days. lin.

$$f(x) = 25 + 5x$$

Complete the table and draw the graph.

Days	Money
0	25
1	30
2	35
3	40
4	45
5	50



Evaluate the following (using the equation/table/graph)

$$f(3) = 40$$

$$f(3) = 25 + 5(3)$$

$$f(2) = 35$$

$f(1) = 30$

$f(0) = 25$

Example 7 (continued): Explain what $f(3)$ means in context of the problem. *On $f(3)$ means how much money you made after 3 days.*

Example 8: Evaluate the following with the given inputs.

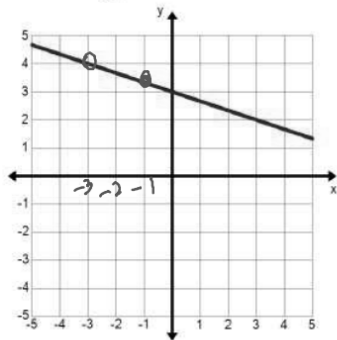
A. $f(x) = 3x - 5$ with $\{-2, 2, 3, 10\}$

$$f(-2) =$$

$$f(2) =$$

B. $g(x) = x^2 - 5$ with $\{-2, 2, 3, 10\}$

Example 9: Use the graph and the table to evaluate the following.



x	$f(x)$
-1	$\frac{10}{3}$
0	3
2	$\frac{7}{3}$
3	2

- A. $f(-3) = 4$
 B. $f(-1) = \frac{10}{3}$
 C. $f(0)$
 D. $f(2)$
 E. $f(3)$