

Relation: A relationship between a set of x -values (input) and a set of y -values (output)

Domain: the complete set of inputs (x -values)

Range: the complete set of outputs (y -values)

Set Notation: $\{2, \Delta, X\}$ no repeats

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

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

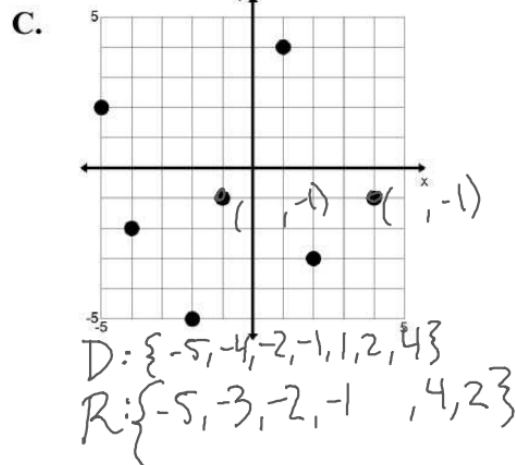
Domain: $\{-1, 0, 7\}$

Range: $\{0, 5, -9\}$

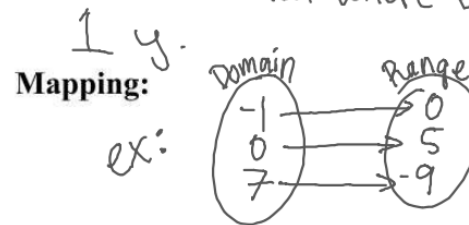
B.

x	y
-1	6
0	9
8	15

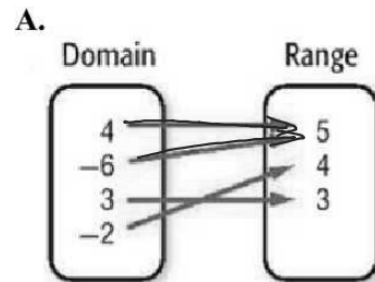
$D: \{-1, 0, 8\}$
 $R: \{6, 9, 15\}$



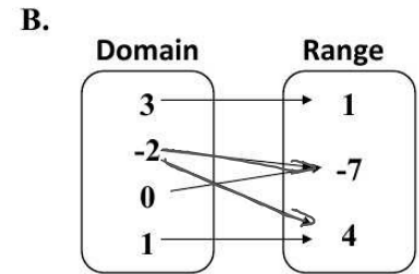
Function: a relation where every x has exactly 1 y .



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



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

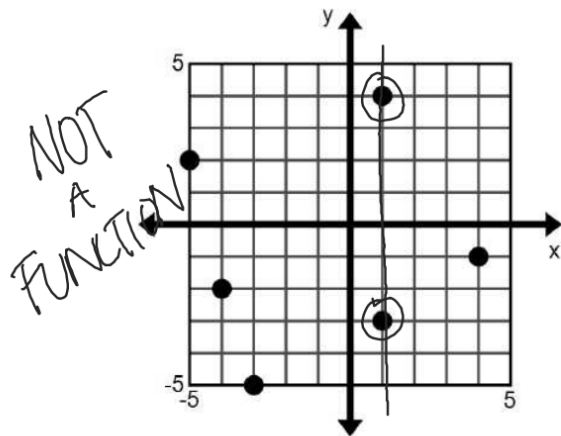


$\{(1, 2), (5, 6), (6, 5), (2, 1)\}$
Not a Function

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

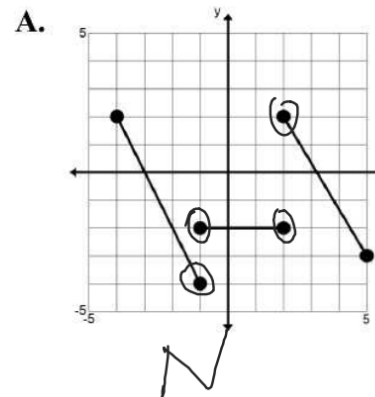
Function

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



Vertical Line Test: If the graph intersects a vertical line in 2 or more places then it is not a function

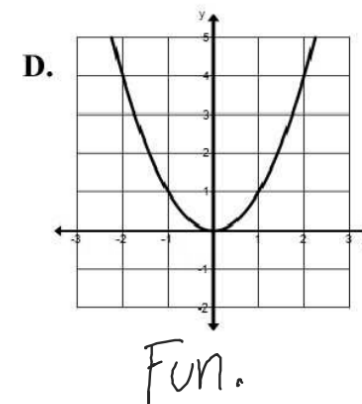
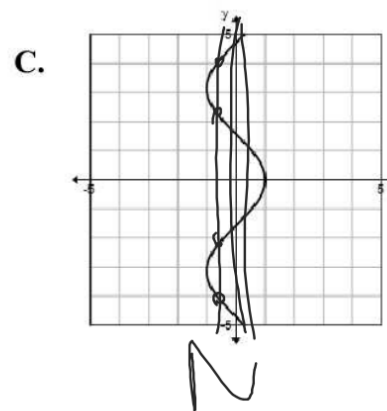
Example 5: Determine which of the following relations represent functions.



B.

x	y
-1	6
0	9
8	15
10	6

Fun.



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

HOW DO YOU CHECK IF IT IS A FUNCTION?

GRAPH	TABLE or LIST	MAPPING
Vertical line test	check for repeated x's	2 arrows from 1 x

Function:**Function Notation:** $f(x)$ "f of x"

f is a function of x

Independent: (x, input)**Dependent:** (outputs, $f(x)$)

a variable that does NOT depend on the other

a variable that does depend on the other

Example 6: Circle the equations that are correctly in function notation.

$y = 2x + 4$

$f(x) = 3x$

$f = 7x - 9$

$g(x) = 2x - 13$

$x = 8y - 13$

$h(x) = 15$

$y = 2x^2$

$f = 5x$

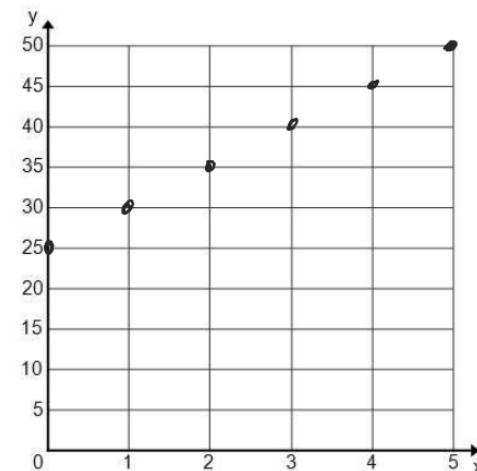
$z(x) = -8x^3$

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.

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

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)

$f(3) = 40$

$f(1) = 30$

$f(2) = 25 + 5(2)$
 $= 25 + 10 = 35$

$f(0) = 25$

Example 7 (continued): Explain what $f(3)$ means in context of the problem.

After 3 days, there is \$40 in the account.

Example 8: Evaluate the following with the given inputs.

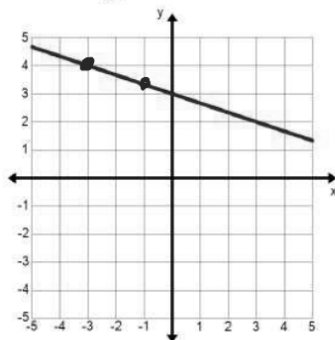
A. $f(x) = 3x - 5$ with $\{-2, 2, 3, 10\}$

$$f(-2) = 3(-2) - 5 = f(3) =$$

$$f(2) = \quad f(10) =$$

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	$\frac{10}{3} = 3\frac{1}{3}$
0	3
2	$\frac{7}{3}$
3	2

A. $f(-3) = 4$
B. $f(-1) = 10/3$

C. $f(0)$

D. $f(2)$

E. $f(3)$