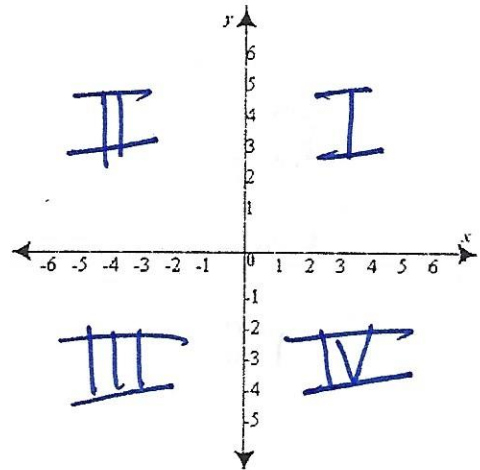


Getting Started: Identify the quadrant or axis the points lie on. Then, graph the points.

- A:  $(-2, 3)$  Quad II
- B:  $(-3, 0)$  x-axis
- C:  $(4, -6)$  Quad IV
- D:  $(0, 5)$  y-axis
- E:  $(4, 3)$  Quad I



Some important definitions:

**Relation** – A set of ordered pairs  $(x, y)$

\***Domain** – The set of all the independent variables or x-values (INPUTS) of a relation.

\***Range** – The set of all the dependent variables or y-values (OUTPUTS) of a relation.

**Function** – A relation where every element of the domain is paired with exactly one element of the range. \*each x-value is used once, no repeats

**Mapping** – an illustration showing how each element of the domain is paired with another element of the range in a relation

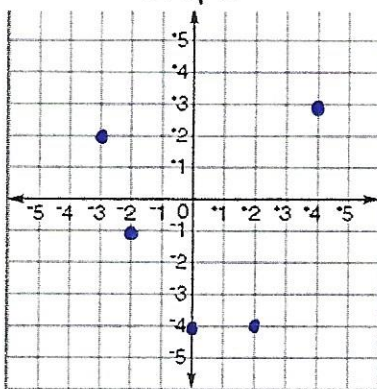
Ex. #1 – Express the relation  $\{(4, 3), (-2, -1), (-3, 2), (2, -4), (0, -4)\}$  as a table, a graph, and a mapping.

Least  $\rightarrow$  Greatest

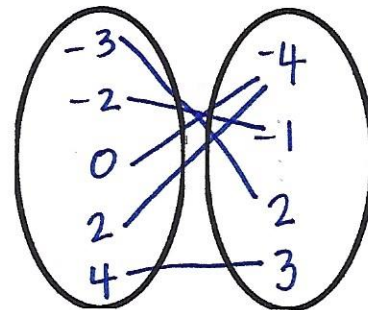
Table:

* x	y
-3	2
-2	-1
0	-4
2	-4
4	3

Graph:



Mapping:



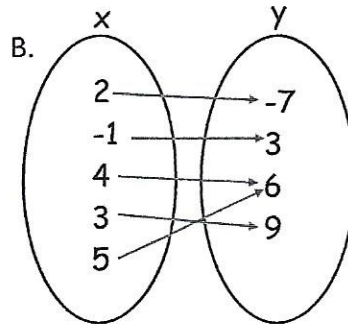
Is the relation shown a function? Yes or No Why? no x-values repeat

Ex. #2 – Determine if the following relations are functions.

A.

x	y
5	3
2	6
0	3
2	4
3	9

no



yes

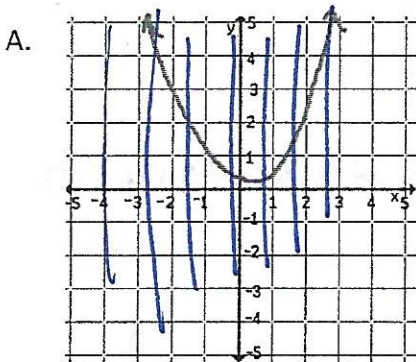
C.  $\{(-2, 4), (1, 5), (3, 6), (5, 8), (7, 10)\}$

yes

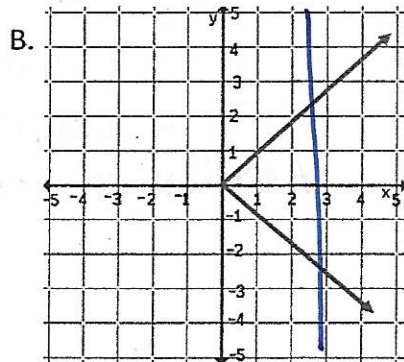
**Vertical Line Test** – A method of determining whether a graph is a function or not a function

- If no vertical line can be drawn that will intersect the graph more than once, then the graph is a function. If the vertical line intersects the graph at least twice, the graph is NOT a function.
- Why does the vertical line test work? A vertical line highlights each x-value individually

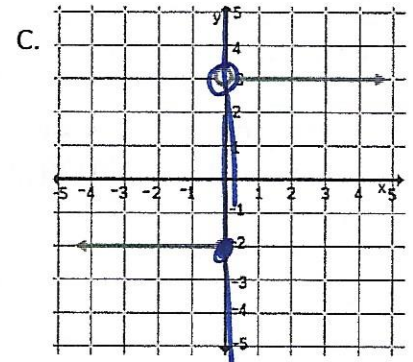
Ex. #3 – Determine whether the following graphs are functions.



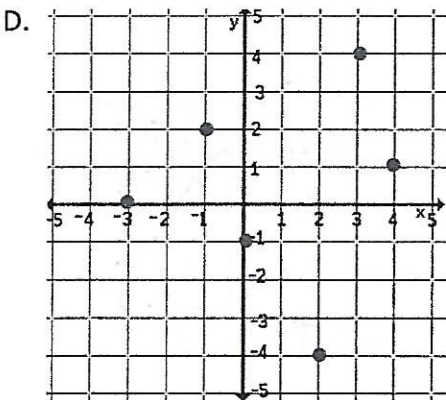
yes



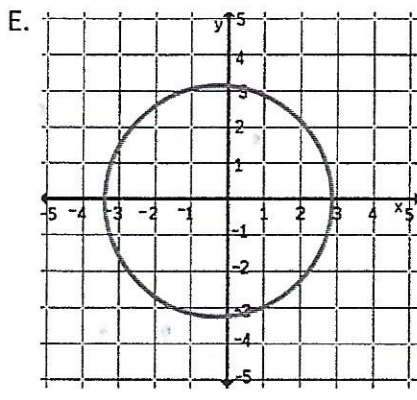
no



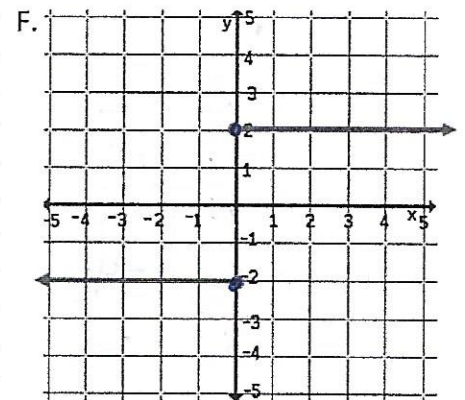
yes



yes



no



no

**Inverse Relations** – A relation that occurs when the elements of the domain <sup>are</sup> and switched with elements of the range.  $x \leftrightarrow f(x)$

Ex. #4 – See mapping to the right.

- A. Does this mapping represent a function? Why?

Yes. No x-values repeat

- B. What is the domain of the relation?

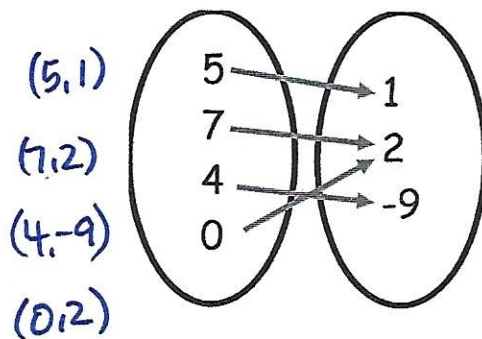
$\{0, 4, 5, 7\}$

- C. What is the range of the relation?

$\{-9, 1, 2\}$

- D. Write the inverse of this relation.

$\{(1, 5), (2, 7), (-9, 4), (2, 0)\}$



**Practice Problems:**

#5 – See the relation to the right.

$\{(4, 3), (-2, -1), (-3, 2), (2, -4), (0, -4)\}$

- A. Does this relation represent a function? Why?

Yes. no x-values repeat

- B. What is the domain of the relation?

$\{-3, -2, 0, 2, 4\}$

- C. What is the range of the relation?

$\{-4, -1, 2, 3\}$

- D. Write the inverse of this relation.

$\{(3, 4), (-1, -2), (2, -3), (-4, 2), (-4, 0)\}$

#6 – See the relation to the right.

- A. Does this relation represent a function? Why?

- B. What is the domain of the relation?

- C. What is the range of the relation?

- D. Write the inverse of this relation.

x	y
0	-19
1	-12
2	-4
3	3
4	13
5	27