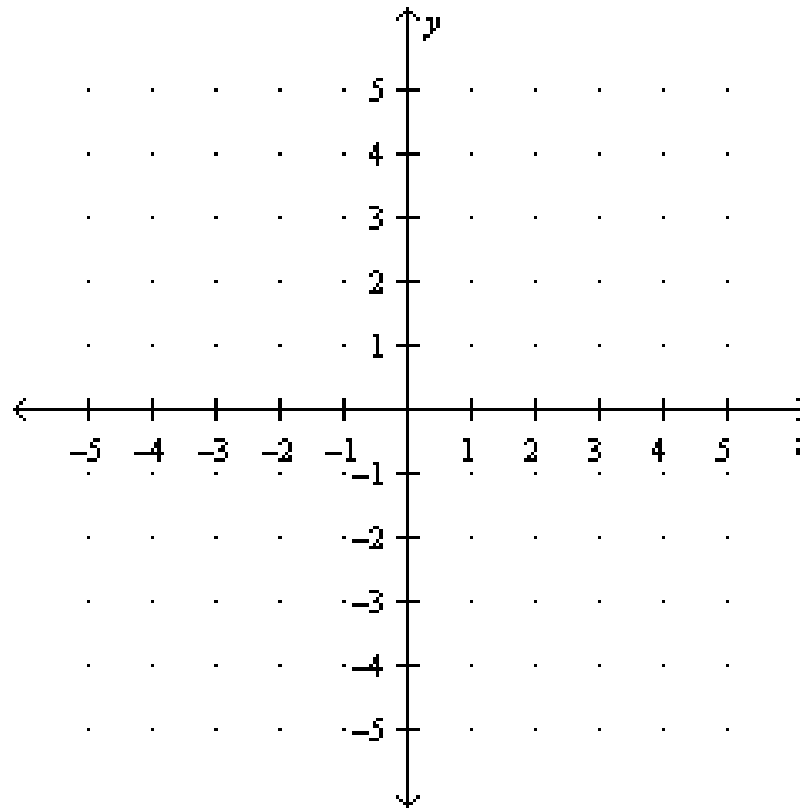


Notes #5 ~ Sect. 2.1: Relations & Functions

Relation : A set of ordered pairs.

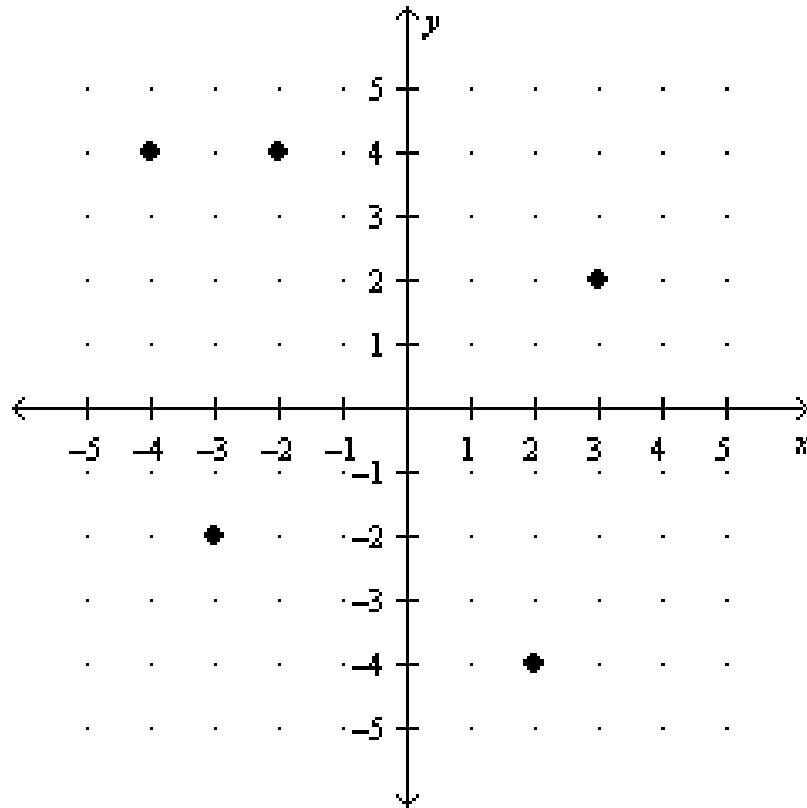
Ex. 1 : Graph the relation $\{(-3, 3), (2, 2), (-2, -2), (0, 4), (1, -2)\}$.



Domain (Input) : The set of all x-coordinates of an ordered pair.

Range (Output) : The set of all y-coordinates of an ordered pair.

Ex. 2: Write the ordered pairs for the relation. Find the domain and range.



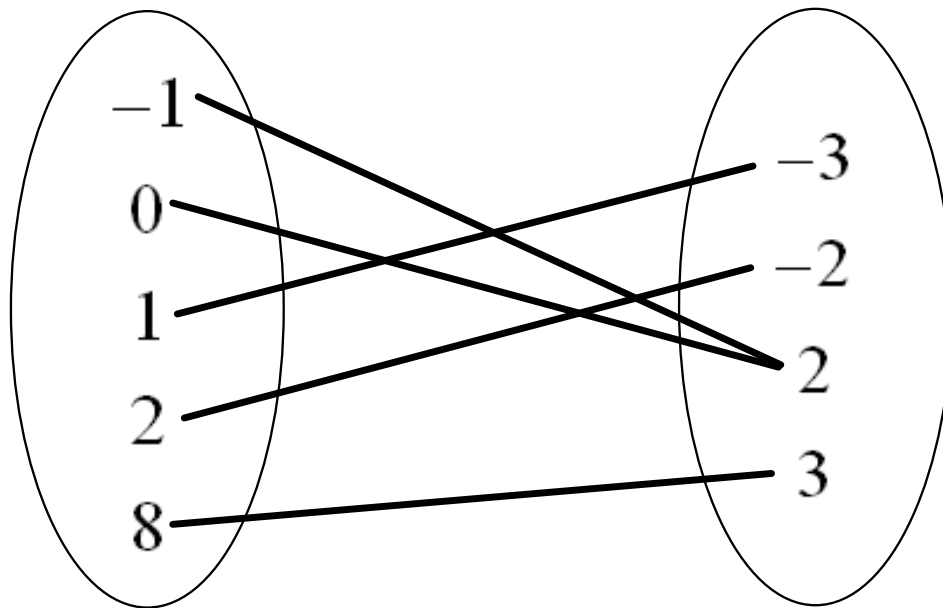
Mapping Diagram : Links elements of the domain with corresponding elements of the range.

Ex. 3: Make a mapping diagram for the relation.

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

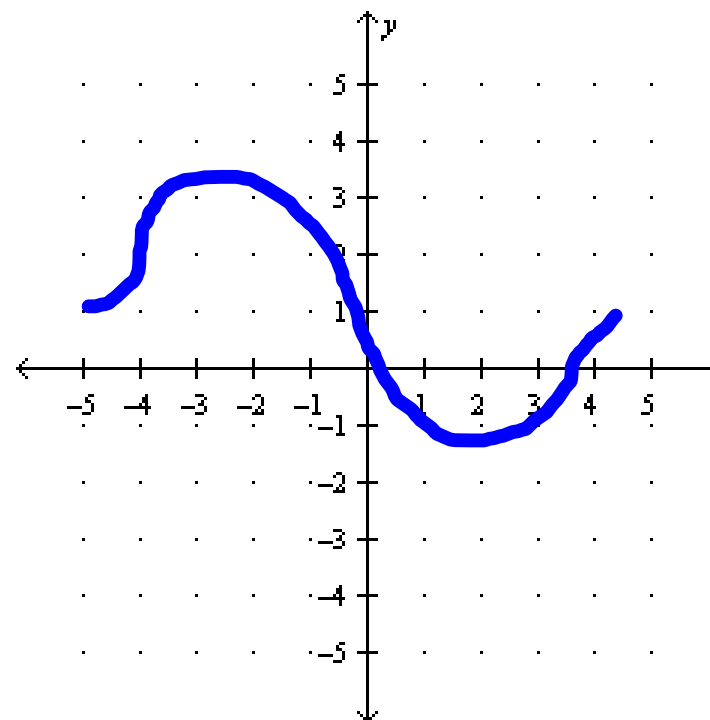
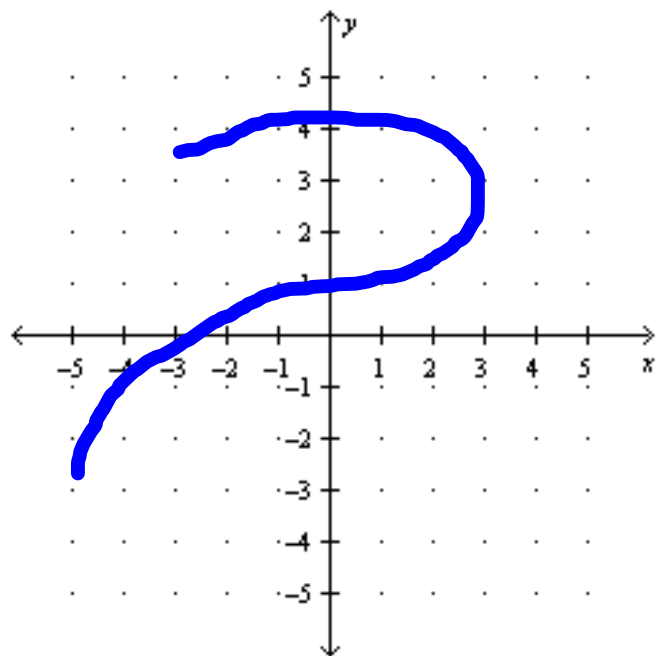
Functions : A relation in which each element of the domain is paired with exactly one element in the range. (For every "x" there is only one "y".)

Ex. 4 : Determine whether the relation is a function.



Vertical Line Test : If a vertical line passes through two or more points on a graph, then the relation is not a function.

Ex. 5: Use the vertical line test to determine whether the graph represents a function.



Function Notation : You read $f(x)$ as "f of x" or "a function of x". Note that $f(x)$ does not mean "f times x". When the value of x is 3, $f(3)$ reads "f of 3," represents the value of the function when $x=3$.

Ex. 6 : Find $f(2)$ for each function.

$$a) f(x) = -x^2 + 1$$

$$b) f(x) = |3x|$$

$$c) f(x) = \frac{9}{1-x}$$