## : Relations and Functions
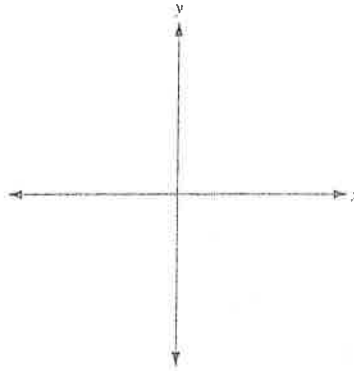
___ew of **quadrants** and **axes** of the Cartesian coordinate plane:



A _____ is a set of ordered pairs (x, y).

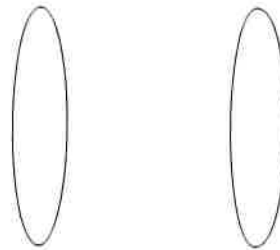    Example:

The _____ is the set of all x-values on the graph.

    Example:

Th _____ is the set of y-values on the graph.

    Example:

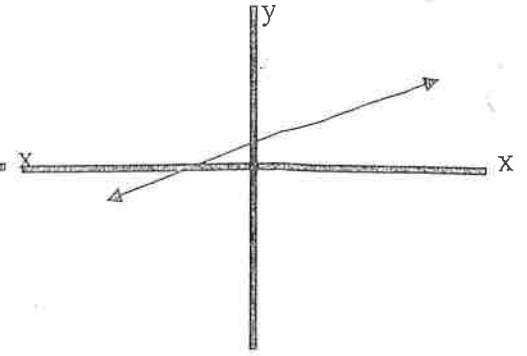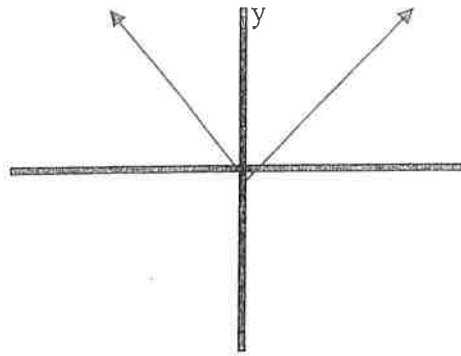A _____ shows how each member of the domain (x) pairs up with each member of the range (y)
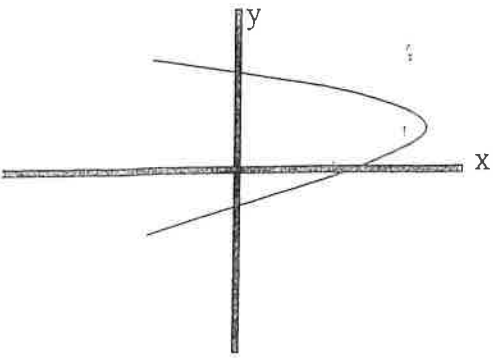
    Example:

An equation is a _____ if any _____ that can be plugged into the equation will yield exactly one _____ out of the equation.

A relation is NOT a function if a _____ _____ crosses the graph at more than o__ __int. This is called the _____ _____ _____.

Which of the following is/are functions?

Determine if the following relations are functions. If so, find the domain. If not, describe why not.

**1.)**

| Input | 1 | 2 | 5 | 2 | 4 |
|---|---|---|---|---|---|
| Output | 0 | 7 | 4 | 1 | 7 |

Function: YES          NO                    Domain:                              Range:

**2.)**  { (1, 2) (2, 4) (3, 6) (4, 2) }

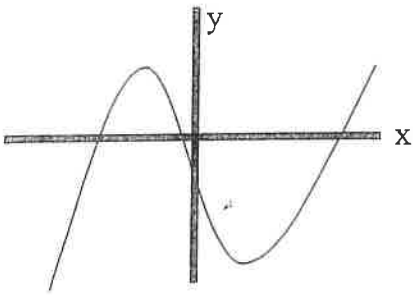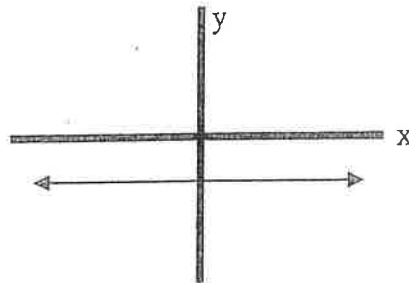Function: YES          NO                    Domain:                              Range:

**3.)**

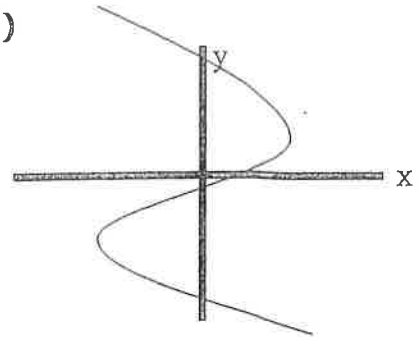Function: YES      NO

Domain:

Range:

**4.)**

Function: YES      NO

Domain:
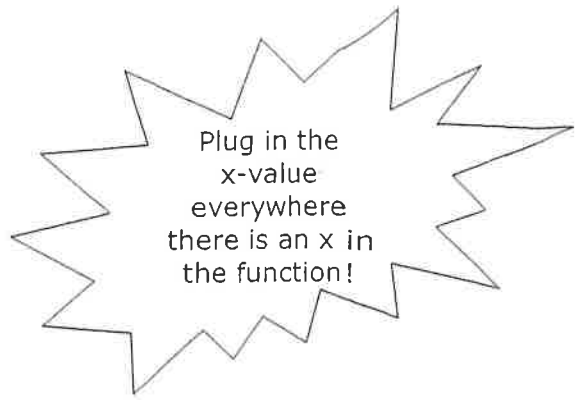
Range:

**5.)**

Function: YES      NO

Domain:

Range:

## Function Notation:

We can replace y= with f(x)=

The way to read this notation is "f of x"

This notation means we want the value of function f at point x. When x=#, what is f(x) or y?

It DOES NOT mean "f times x"

### EX 1: $y = 3x + 2 \rightarrow f(x) = 3x + 2$. Evaluate…

| x | f(x) | (x, y) |
|---|------|--------|
| 1 | f(   )= 3(   ) + 2= | |
| 2 | f(   )= 3(   ) + 2= | |
| 3 | f(   )= 3(   ) + 2= | |

### EX 2: $f(x) = x^2 + 2x - 3$. Find $f(2)$ and $f(-2)$.

| f(2) | f(-2) |
|------|-------|
| | |

## Writing and Evaluating a Function:

Write a function rule to model the cost per month of a long distance cell phone calling plan. Then evaluate the function for the given number of minutes.

a) Monthly service fee: $4.52
   Rate: $.12 per minute
   Minutes Used: 250

b) Monthly service fee: $3.12
   Rate: $.18 per minute
   Minutes Used: 175