

A **relation** is any set of ordered pairs. The set of all first components of the ordered pairs is called the **domain** of the relation and the set of all second components is called the **range** of the relation.

In class: find the domain and the range of the relation: $\{(5, 12.8), (10, 16.2), (15, 18.9), (20, 20.7), (25, 21.8)\}$

Mapping diagram:

Function:

Determine whether each relation is a function:

- a. $\{(1, 6), (2, 6), (3, 8), (4, 9)\}$ b. $\{(6, 1), (6, 2), (8, 3), (9, 4)\}$

****A function can have two different first components with the same second component!**

Independent variable:

Dependent variable:

Determining whether an equation represents a function.

**Solve each equation below to determine whether the equation defines y as a function of x :

a. $2x + y = 6$

b. $x^2 + y^2 = 1$

The special notation $f(x)$, read "f of x" or "f at x", represents the value of a function at the number x.

- When we substitute a value in for x, then we are **evaluating the function**.

- If a function is named f and x represents the independent variable, the notation $f(x)$ corresponds to the y-value for a given x. This would also be the dependent variable.

In class:

Evaluate the function $f(x)=x^2+3x+5$ for the following:

a. $f(2)$

b. $f(x+3)$

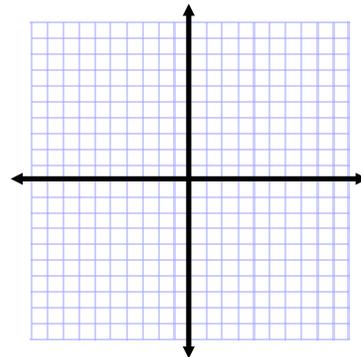
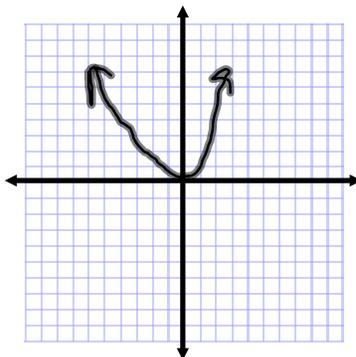
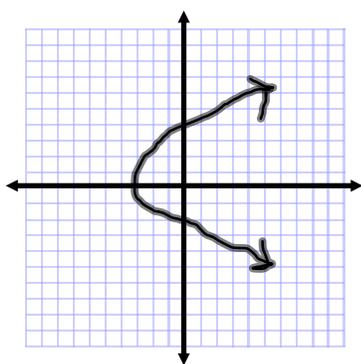
c. $f(-x)$

Determining if a function by graphing:

- **Vertical line test**

If any vertical line intersects a graph more than one point, the graph does not define y as a function of x .

In class: Determine if the following graphs are functions of x .



Information from Graphs

- a closed dot indicates that the graph does not extend beyond this point and the point belongs to the graph.
- An open dot indicates that the graph does not extend beyond this point and the point does not belong to the graph.
- An arrow indicates that the graph extends indefinitely in the direction in which the arrows points.

Zeroes of a function:

Note: A function can have more than one x -intercept but at most one y intercept

Domain and range revisited:

In class: pg 199 #77-80

Assignment