# § 2.3 Analyzing Graphs of Functions
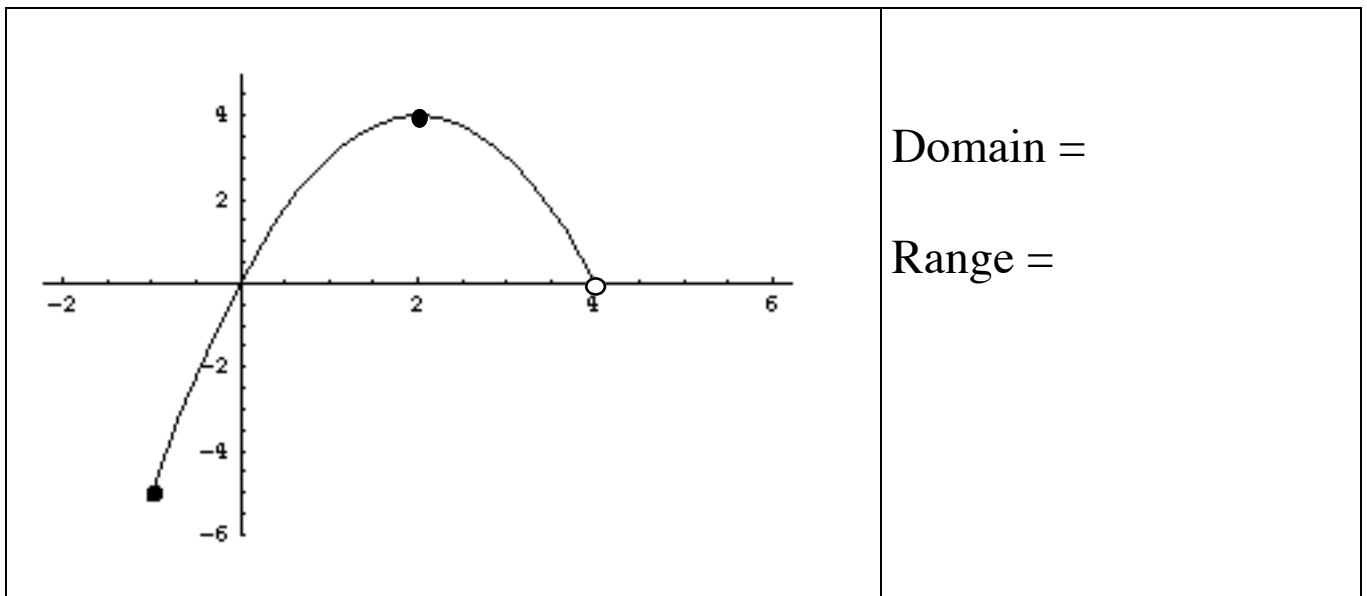
The **graph of a function f** is the collection of ordered pairs (x, f(x)) such that x is in the domain of f.

To find **domain** from graph look at the x - values (left to right)

To find **range** from graph look at the y - values (up and down)

Example:



Domain =

Range =

**Increasing Function:** A function where as x-values increase so do the y-values.
(Note: graph will rise up to the right)

Example: Graph  $y = 2x + 5$

**Decreasing Function:** A function where as x-values increase y-values decrease.
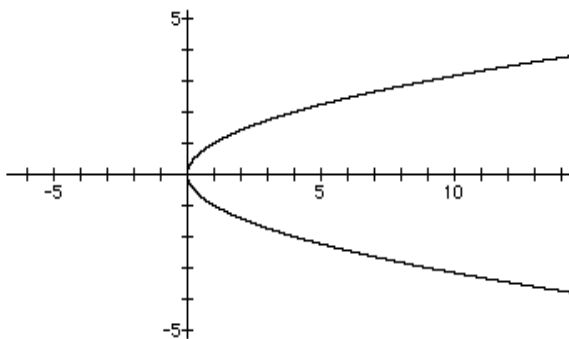(Note: graph will fall down to the right)
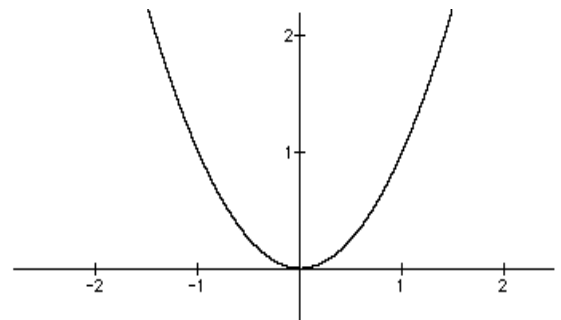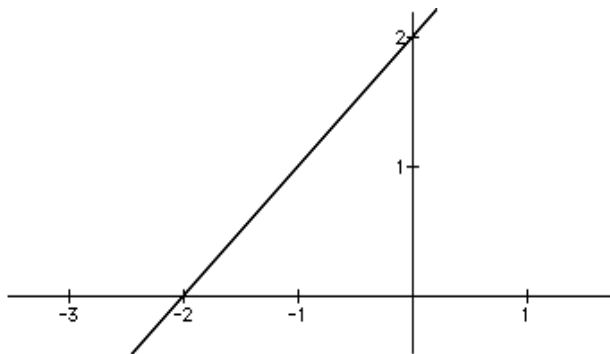
Example: Graph  $y = -x + 4$

**Constant function:**     The graph is a flat horizontal line.

Example: Graph  $y = 3$

**Vertical Line Test:**

If every vertical line drawn intersects a graph in no more than one point, the graph is the graph of a function.

Example: Are the following graphs functions ?

**Even and Odd Functions**

| A function given by y = f(x) is **even** if:<br><br>$f(-x) = f(x)$<br><br>(Note: the function will be symmetric to the y-axis.) | A function given by y = f(x) is **odd** if:<br><br>$f(-x) = -f(x)$<br><br>(Note: the function will be symmetric to the origin.) |
|---|---|

Example: Are the following functions even or odd or neither ?

a) $f(x) = x^3 - x$

b) $f(x) = x^2 + 1$