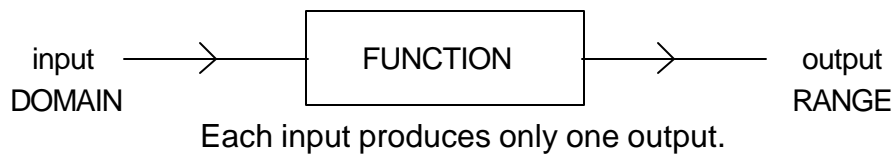


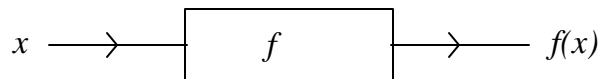
FUNCTIONS

- A *function* is a relation which is **1 : 1** or **n : 1** ie. no two ordered pairs have the same first element.
- A function can be thought of as a *machine*.



☺ Which of the following are functions $x = 2$, $y = 2$, $y = 3x$, $y = x^2$, $y^2 = x$, $x^2 + y^2 = 25$?

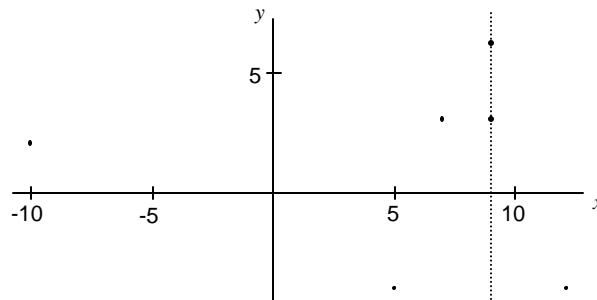
- A function can be represented by *function notation*.



eg. The function $y = x^3$ can be written as $f(x) = x^3$.
 The function $s = 20t - 5t^2$ can be written as $g(t) = 20t - 5t^2$.

Function notation allows "when $x = 4$, $y = 4^3 = 64$ " to be replaced with " $f(4) = 4^3 = 64$ ".

- The input of a function is called the *independent variable*.
 The output of a function is called the *dependent variable*.
 eg. The function $V = 20 - 10T$ has dependent variable V and independent variable T .
 V is a function of T ie. the value of V depends on the value of T .
- The *vertical line test* can be used to determine whether a graph represents a function. *Any vertical line must pass through at most one point.*



In the above example, the vertical line passes through two points. Therefore the graph does not represent a function as two ordered pairs have the same first element.

- A *discrete function* has a graph which consists of a set of distinct points.
 eg. $C = 1.2n$ where \$ C is the cost of buying n chocolate bars.
- A *continuous function* has a graph which contains no breaks.
 eg. $P = 0.7m$ where \$ P is the cost of buying m kg of potatoes.
- A *discontinuous function* has a graph which contains a break.
 eg. $y = \frac{1}{x}$ where x is any real number except 0 (Why is 0 excluded?)