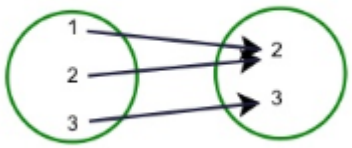
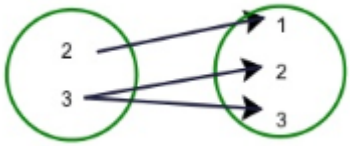
1.2 Functions and Graphs

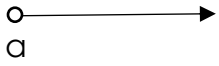
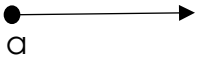
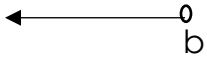
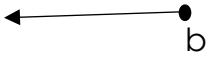
Function: For each independent variable x, there is exactly one variable y.

Function	Not Function
	

Domain: Input of function, the independent variables.

Range: Output of function, the dependent variables.

Natural Domain: The largest set of x-values for which the formula gives real y-values.
***We can restrict the domain.

Notation		
The set of all real numbers  $-\infty < x < \infty, (-\infty, \infty)$	The set of numbers greater than *a*.  $a < x, or\ (a, \infty)$	The set of numbers greater than or equal to *a*.  $a \leq x, or\ [a, \infty)$
The set of numbers less than *b*.  $x < b, or\ (-\infty, b)$	The set of numbers less than or equal to *b*.  $x \leq b, or\ (-\infty, b]$	Open Interval *ab*.  $a < x < b, or\ (a, b)$
Closed Interval *ab*.  $a \leq x \leq b, or\ [a, b]$	Closed at *a* and open at *b*.  $a \leq x < or\ [a, b)$	Open at *a* and closed at *b*.  $a < x \leq b\ or\ (a, b]$

Boundary Points: End points of the interval.
Interior Points: All other points besides the boundary points.

Closed Intervals: Contain boundary points.

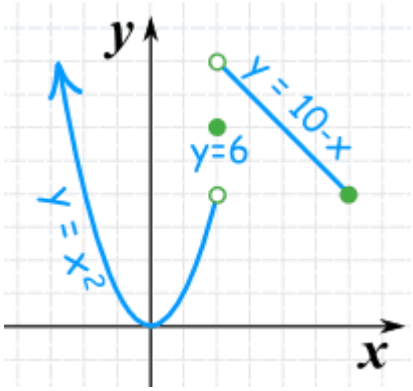
Open Interval: contains no boundary points.

Even Function or Odd Function: A function $y = f(x)$ is an

Even Function of x if $f(-x) = f(x)$, which are symmetric about the y-axis.

Odd Function of x if $f(-x) = -f(x)$, which are symmetric about the origin.

Piecewise Functions: A function that is defined on a sequence of intervals.



$$f(x) = \begin{cases} x^2 & x < 2 \\ 6 & x = 2 \\ 10 - x & 2 < x \leq 6 \end{cases}$$