Functions

Among several relations that exist between two non-empty sets, some special relations are important for further exploration. Such relations are called "Functions".

Points to Remember related to functions :-

If $f : X \to Y$ is a function then

- The set X is called the domain of the function f and the set Y is called its co-domain.
- If $f(a) = b$, then b is called 'image' of a under f and a is called a 'pre-image' of b.
- The set of all images of the elements of X under f is called the 'range' of f.
- $f : X \to Y$ is a function only if
  (i) every element in the domain of f has an image.
  (ii) the image is unique.
- If A and B are finite sets such that $n(A) = p$, $n(B) = q$ then the total number of functions that exist between A and B is q^p.
- In this chapter we always consider f to be a real valued function.
- Describing domain of a function

(i) Let $f(x) = \frac{1}{x+1}$. If $x = -1$ then $f(-1)$ is not defined. Hence f is defined for all real numbers except at $x = -1$. So domain of f is $\mathbb{R} - \{-1\}$.

(ii) Let $f(x) = \frac{1}{x^2 - 5x + 6}$; If $x = 2, 3$ then $f(2)$ and $f(3)$ are not defined. Hence f is defined for all real numbers except at $x = 2$ and 3. So domain of $f = \mathbb{R} - \{2, 3\}$.