

# Functions

⇒ Two functions are equal if they have same domain, same range and same mapping.

⇒ A bit change in any one of these will change the equality.

⇒ A function is called real valued function if its codomain is ~~real valued~~ set of real numbers.

⇒ And is called integer Boss

valued if it's codomain  
is integer set.

⇒ Two realvalued or integer  
valued functions can be  
added or multiplied.

$$f_1(x) = x^2$$

$$f_2(x) = x - x^2$$

$$\begin{aligned}(f_1 + f_2)(x) &= f_1(x) + f_2(x) \\ &= x^2 + x - x^2 \\ &= x\end{aligned}$$

$$\begin{aligned}(f_1 f_2)(x) &= f_1(x) \cdot f_2(x) \\ &= x^2 (x - x^2) \\ &= x^3 - x^4\end{aligned}$$

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## One - to - One

A function is said to be one-to-one or an injection - If and only if  $f(a) \neq f(b)$  implies that  $a \neq b$  for all  $a$  and  $b$  in the domain of  $f$ . A function is said to be injective if it is one to one.

## Onto Function

A function from  $A$  to  $B$  is called onto or surjective function if and only if for every element  $b \in B$  there is an element  $a \in A$  with  $f(a) = b$ . A function is called surjective if it is onto.

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→ A function is onto if  
 $\forall y \in Y \exists x (f(x) = y)$

where domain of  $x$  = domain  
domain of  $y$  = codomain  
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# One-to-One Correspondence / Bijection

The function is ~~one-to-one~~ correspondence or bijection, if it is both ~~one-to-one~~ and onto we also say that such function is bijective.

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## Partial Function

Certain function which is undefined for particular input in the destination of domain of function is called partial function

⇒ we denote it in same way as normal function  
 $f: A \rightarrow B$

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