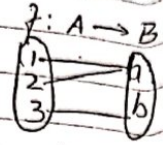
Calculus:

Function(f): is a rule which associates every element of set A to a unique element of set B.

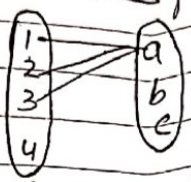
Eg:

i) $f: A \to B$



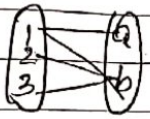
∴ It is a function.

ii)



∴ It is not a function because 4 does not have an image.

iii)



∴ It is not a function as 1 does not have a unique image.

iv) $f(x) = 2x+3$ is a function on Natural nos.

v) $x = f(p)$ is a demand function, where $x \to$ quantity, $p \to$ price.

Limit of a function:

$f(x)$ is said to have a limit as $x \to a$ if $\lim_{x \to a^+} f(x) = f(a) = \lim_{x \to a^-} f(x)$

Properties of limits

- $\lim_{x \to a} (f(x) \pm g(x)) = \lim_{x \to a} f(x) \pm \lim_{x \to a} g(x)$
- $\lim_{x \to a} (f(x)\, g(x)) = \lim_{x \to a} f(x) \cdot \lim_{x \to a} g(x)$
- $\lim_{x \to a} \left[\frac{f(x)}{g(x)}\right] = \frac{\lim_{x \to a} f(x)}{\lim_{x \to a} g(x)}$