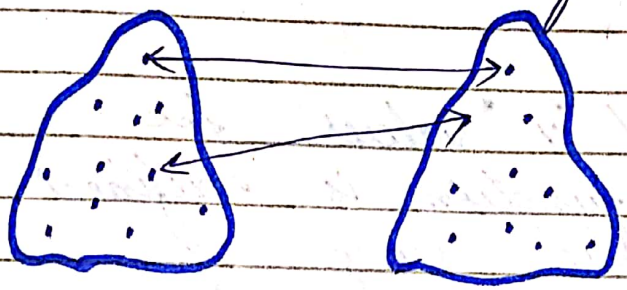
FUNCTIONS:

"For every value of x in a relation if their is an exactly one value of 'y'. Then the relation is called a function."



y
range
→ output
→ depent variable

x.
domain
→ Input
→ Independent variables
→ ایک سے زیادہ بھی ہو سکتے ہیں
Function defined.

$\because V = kT$

$V = f(T)$

This means 'V' is the f of T.

FUNCTION NOTATION (represented as):

y is a function of x

$y = f(x)$

output, input

In maths value of x is called as domain.

DOMAIN:

Set of x values for which their are real values of y is called domain of function.

'x' ki wo values jis k zaye hm y ki real values hasil kr skty hn.

RANGE:

Set of 'y' values for which function is defined is called range of function.

$$V = \frac{nRT}{P}$$

$$V = f(n, T, P)$$

EXAMPLES:

1) $y = \frac{4}{3-x}$ ⇒ minus is not part of function

If $x = 1$ then

$$y = \frac{4}{3-1}$$

$$y = \frac{4}{2}, \quad y = 2$$

This means $x = 1$ is a part of domain.

If $x = 2$ then

$$y = \frac{4}{3-2}$$

$$y = \frac{4}{1}$$

This means $x = 2$ is also domain and $y = 4$ is a defined function.

If $x = 3$ then:

$$y = \frac{4}{3-3}$$

$$y = \frac{4}{0}$$

$\boxed{y = \infty}$

⇒ Something divided by zero is infinity

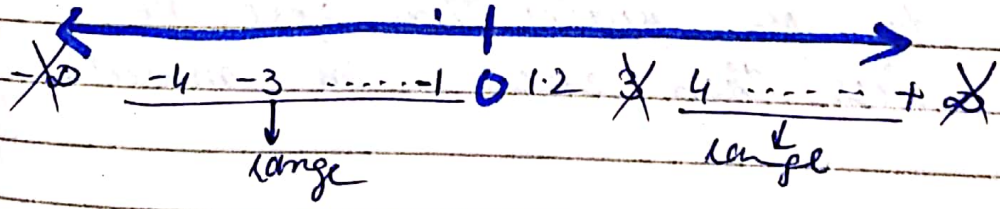
This is not the part of domain and function is undefined.

$-\infty$, $+\infty$, 3 are not domain functions.

⇒ $(-\infty, 3)$ $-\infty$ se 3 K domain waly no. domain ka hissa hn, or 3 se $+\infty$ B K domain K no. b domain ka hissa hn.

⇒ $-\infty$ or 3 small bracket k sat hn is ka mtlb ye domain nai hn.

$$(-\infty, 3) \cup (3, +\infty)$$



denominator ko zero nai hona chahiya warna ∞ ho jaey ga. Ar function undefined ho ga. Jis point pe wo zero hota h wo point ya value ko nikal den wo do main ka hissa nai h.

2) $y = \sqrt{4-3x}$

If $x = 1$ then

$y = \sqrt{4-3(1)}$

$= \sqrt{4-3}$

$y = \sqrt{1}$ ye domain ka hissa ha kyu k ye possible h.

If $x = 2$ then:

$y = \sqrt{4-3(2)}$

$= \sqrt{4-6}$

$y = \sqrt{-2}$ This is not part of domain because $\sqrt{-2}$ is not calculate able. x must have value equal to or greater than zero not less then zero in minus.

$4 - 3x \geq 0$

$4 \geq 3x$

$x \leq \frac{4}{3}$

It means value of 'x' must be equal to or less then $\frac{4}{3}$ not above then $4/3$.

$4/3 = 1.33333.$

Put it in eqn.

$y = \sqrt{4 - 3(1.3333)}$

$= \sqrt{4 - 4}$

$y = \sqrt{0}$ possible.

if $x = 1.444$ Then

$y = \sqrt{4 - 3(1.44)}$

$y = \sqrt{\quad}$ The function undefined coz greater then $4/3$.

24 Oct — Thurs

→ Matrices
- Huckle MO
- Symmetry

→ Function:
- Binary relation

$y = f(x)$

e.g.; $V = kT$

$V = f(T)$

→ Domain: Set of 'x' values for which function is defined

→ Range: Set of 'y' values for which function is defined

⇒ According to the logic the value of 'T' is in kelvin it is temp. It will never be less than zero. The value is zero or above the zero.

⇒ According to math all -ve & +ve values are involved except $-\infty$ & $+\infty$.

TYPES OF FUNCTIONS:

i) POLYNOMIAL FUNCTION:

$$P(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} \cdots a_0 x^0$$

highest power of independent variable = degree of polynomial

e.g; $y = 3x^{2} + 7x + 9$

degree = 2

= 2nd degree

Cubic equation:

$y = 3x^{3} + 5x^{2} + 4x + 100$

degree = 3rd

$y = mx^{1} + c$

degree = 1

ii) LINEAR FUNCTION: used in physical chemistry

$y = mx + c$

iii) RATIONAL FUNCTION:

rational function of x

$$R(x) = \frac{P(x)}{Q(x)}$$

where $P(x)$ & $Q(x)$ are polynomials

iv) TRIGNOMETRIC FUNCTION:

$$y = \sin x$$
$$y = \cos (1 - 3x)$$

Schrodinger wave eqn. $\Psi = A \sin \frac{n\pi}{a} x$

v) LOGRITHMIC FUNCTION:

$$\log k = \frac{-Ea}{2.303RT} + \log A$$

Arrhenuis eqn. in straight form.

vi) EXPONENTIAL FUNCTION:

$$k = Ae^{\frac{-Ea}{RT}}$$

Note:

Henderson's eqn. shows effect of temp.

$$k = Ae^{+\frac{Ea}{RT}}$$

vii) EXPLICIT FUNCTION:

$$x^2y + x^3y^2 = 2$$

$$x^2y = -x^3y^2$$

$$y = -1/x.$$

y has been explicitly expressed in terms of x.
In other words, iss eqn. jis me x or y alag ho jain yani equall k dono taf ho jain to iss explicit eqn. ho ge.

viii) IMPLICIT FUNCTION:

$$x^2 + xy + y^2 = 7$$

The function in which y is not explicitly expressed in terms of x.