YAKEEN NEET 2.0

2026

Mini Lecture – Calculation Basic maths

Basic Maths and Calculus (Mathematical Tools)

PHYSICS | Lecture - 01

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Topics to be covered

Basic calculation of 8 , 9 and 10th class

$1^2 \longrightarrow 1$

$2^2 \longrightarrow 4$

$3^2 \longrightarrow 9$

$4^2 \longrightarrow 16$

$5^2 \longrightarrow 25$

$6^2 \longrightarrow 36$

$7^2 \longrightarrow 49$

$8^2 \longrightarrow 64$

$9^2 \longrightarrow 81$

$10^2 \longrightarrow 100$

$11^2 \longrightarrow 121$

$12^2 \longrightarrow 144$

$13^2 \longrightarrow 169$

$14^2 \longrightarrow 156$

$15^2 \longrightarrow 225$

$16^2 \longrightarrow 256$

$17^2 \longrightarrow 289$

$18^2 \longrightarrow 324$

$19^2 \longrightarrow 361$

$20^2 \longrightarrow 400$

$21^2 \longrightarrow 441$

$22^2 \longrightarrow 484$

$23^2 \longrightarrow 529$

$24^2 \longrightarrow 576$

$25^2 \longrightarrow 625$

- $x^0 = 1 \quad , (x \neq 0)$
- $x^{-2} = \frac{1}{x^2}$
- $\frac{1}{x^2} = x^{-2}$
- $x^{-3} = \frac{1}{x^3}$
- $\frac{1}{x^{-2}} = x^2$
- $x^{-1} = \frac{1}{x}$
- $\frac{1}{x^{-3}} = x^3$

- $2^3 = 2 \times 2 \times 2$
- $2^3 \times 2^2 = 2^5$
- $x^n \cdot x^m = x^{n+m}$
- $\frac{x^n}{x^m} = x^{n-m}$

$\Rightarrow \quad \frac{10^5}{10^3} = 10^{5-3} = 100$

$\frac{100000}{1000} = 100$

- $x^{\frac{1}{2}} = \sqrt{x}$

- $x^{-1} = \frac{1}{x}$

- $x^{-\frac{1}{2}} = \frac{1}{x^{\frac{1}{2}}} = \frac{1}{\sqrt{x}}$

- $x^{3/2} = x \cdot \sqrt{x}$

$(\text{कदकू})^{-1} = \frac{1}{\text{कदकू}}$

- $\frac{1}{\sqrt{x^3}} = \frac{1}{(x^3)^{\frac{1}{2}}} = \frac{1}{x^{3/2}}$

- $\frac{1}{\sqrt{x^5}} = \frac{1}{x^{5/2}} = x^{-5/2}$

- $\frac{1}{\sqrt{x^5}} \times x^{3/2} \times \frac{1}{\sqrt{x^2}} = x^{-5/2} \cdot x^{3/2} \cdot x^{-1}$

$= x^{-5/2 + 3/2 - 1}$

$= \checkmark$

$$(x^n)^m = x^{nm}$$

$$(10^2)^3 = 10^2 \times 10^2 \times 10^2 = 10^6$$

$$(10)^{2+3}$$

→ $\sqrt{2} = 1.41$

→ $\sqrt{3} = 1.73$

→ $\pi = \frac{22}{7} = 3.14$ (Approx)

→ $e = 2.72$ (Approx)

→ $e^{-1} = .37$ (Approx)

→ $1 - e^{-1} = 1 - \frac{1}{e} = .63$ (Approx)

- $\pi^2 = 10$ (Approx)

$e^{-1} = \frac{1}{e} = \frac{1}{2.72}$

$\Rightarrow \quad .5 = \frac{.5}{10} = \frac{1}{2}$

$\Rightarrow \quad .05 = \frac{05}{100} = \frac{1}{20}$

$\Rightarrow \quad .005 = \frac{005}{1000} = \frac{1}{200}$

$= 1$

$\frac{.6}{.2} = \frac{6}{2} = 3$

$\frac{.06}{.002} = \frac{6 \times 1000}{100 \times 2} = 30$

$\frac{.006}{.2} = \frac{6 \times 10}{1000 \times 2}$

$\Rightarrow \quad \frac{.04}{100} \times \frac{.003}{1000} \times \frac{.02}{100} = 24 \times 10^{-7}$

$\Rightarrow \quad \frac{.04 \times .002 \times 5}{.0002 \times 10^{-2}} = \frac{4 \times 2 \times 5 \times 10}{\times 2 \times}$

$\Rightarrow \quad \frac{3.14 \times 10^{7} \times 7}{10^{3}}$

$\Rightarrow \quad 5.2 \times 10^{4} = 52000$

$\Rightarrow \quad 5.43 \times 10^{3} = 5430$

$\Rightarrow \quad 5.0001 \times 10^{5} = 500010$

$\Rightarrow \quad 3432 = 343.2 \times 10^{1} = 34.32 \times 10^{2}$

$= 3.432 \times 10^{3}$

- $\frac{4}{3} = 1.33$
- $\frac{2}{3} = .666$
- $x^2 = 25$
- $x = \sqrt{25}$
- $\sqrt{x} \cdot \sqrt{x} =$

जहाँ Simple $\times, \div, +, -$ करके काम चल सकता है, वहाँ trick etc मत देखो

जल्दी & Accurate answer निकालने की कोशिश करो

$\Rightarrow \quad 2^3 + 2^2 + 2^1 = 8 + 4 + 2 =$ ✓ $\Rightarrow$

$\Rightarrow \quad 2^4 - 2^3 + 2^2 + 2^1 + 2^0 = 16 - 8 + 4 + 2 + 1 =$ ✓

$\Rightarrow \quad 2^3 \times 3^3 = 8 \times 27 =$ ✓

- $10^4 + 10^3 + 10^2 = 10000 + 1000 + 100 = 11100$

- $10^4 \times 10^3 \times 10^2 = 10^9$

-

$$\Rightarrow \quad \frac{6.23 \times 10^{23}}{10^{10}} = 6.23 \times 10^{23-10} = 6.23 \times 10^{13}$$

$$\Rightarrow$$

$$\Rightarrow \quad \frac{9 \times 10^{-9} \times 2 \times 10^{-6}}{3 \times 10^{-4}} =$$

Find value of E

IF $E = \frac{Kq}{r^2}$ where $K = 9 \times 10^9$

$q = 4\,\mu C$

$r = 2\,mm$

$$E = \frac{9 \times 10^9 \times 4 \times 10^{-6}}{(2 \times 10^{-3})^2}$$

$$= \frac{9 \times 4 \times 10^3}{4 \times 10^{-6}} = 9 \times 10^9$$

If $x < y$

$\Rightarrow \frac{1}{x} > \frac{1}{y}$

If $x = y$

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

if $x = \frac{1}{y}$

$\Rightarrow xy = 1$

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

$\Rightarrow x - 5 = 3 - x$

$x - 5 + x = 3$

$x + x = 3 + 5$

$2x = 8$

$x = 4$

$\frac{4+x}{x-7} = \frac{4}{3}$

$3(4+x) = 4(x-7)$

$12 + 3x = 4x - 28$

$12 + 28 = 4x - 3x$

$x = 40$

$\frac{2+x}{3-x} = \frac{5}{3}$

$6 + 3x = 15 - 5x$

$8x = 9$

$x = 9/8$

$3 > 2$

$\frac{1}{3} < \frac{1}{2}$

$.3 < .5$

$\frac{1}{4} > \frac{1}{6}$

$\frac{1}{\pi} < \frac{1}{e}$

+/− sft mistakes

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

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

$$10-(x^2+5x-6) = 10-x^2-5x+6$$

$$10-(t^2-2t+10) = 10-t^2+2t-10$$
$$= -t^2+2t$$

$$(-3)\times(-4) = +12$$

$$(-3)\times 4 = -12$$

Find value of x in following equation

① $5x = 20$

$x = \frac{20}{5} = 4$

② $3x - 10 = 2x + 30$

$3x - 2x = 30 + 10$

$x = 40$

③ $3x + 10 = -2x + 40$

$3x - 2x = 40 - 10$

$x = 30$

④ $\frac{x-5}{x+7} = \frac{2}{3}$

$3x - 15 = 2x + 14$

$x = 29$

⑤ $\frac{3x+4}{2x-5} = \frac{4}{5}$

$15x + 20 = 8x - 20$

$7x = -40$

$x = -40/7$

Q $\frac{x+2}{x-1} = \frac{x+5}{x-3}$

$(x+2)(x-3) = (x+5)(x-1)$

$x^2 - 3x + 2x - 6 = x^2 - x + 5x - 5$

$-x - 6 = 4x - 5$

$4x - x = 6 - 5$

$3x = 1$

$x = \frac{1}{3}$

Q $\frac{2x+5}{3x-2} = \frac{4x-3}{8x+2}$

$(2x+5)(8x+2) = (4x-3)(3x-2)$

$16x^2 + 4x + 40x + 10 = 12x^2 - 8x - 9x + 6$

$4x^2 + 61x + 4 = 0$

Q $\dfrac{3x+9}{6x-12} = \dfrac{4x-8}{2x+4}$

$\dfrac{(x+3)}{(2x-4)} = \dfrac{(2x-4)}{(x+2)}$

$$\frac{1}{x}+\frac{1}{y}=\frac{x+y}{xy}$$

$$\frac{1}{2}+\frac{1}{3}=\frac{3+2}{6}=\frac{5}{6}$$

$$\frac{1}{3}+\frac{1}{6}=\frac{2+1}{6}=\frac{3}{6}=\frac{1}{2}$$

$$\frac{1}{3}+\frac{1}{6}+\frac{1}{2}=\frac{2+1+3}{6}=1$$

$$\frac{4+2+6}{12}=1$$

$$\frac{1}{x}-\frac{1}{y}=\frac{y-x}{xy}$$

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

$$\frac{1}{5}-\frac{1}{6}=\frac{6-5}{30}=\frac{1}{30}$$

$$\frac{1}{8}-\frac{1}{10}=$$

Componendo dividendo

If $\frac{x}{y} = \frac{9}{4} \Rightarrow \frac{\sqrt{x}}{\sqrt{y}} = \frac{3}{2}$

Find

① $\frac{x+y}{x-y} = \frac{9+4}{9-4}$

② $\frac{x^2}{y^2} = \frac{81}{16}$

③ $\frac{x^2+y^2}{x^2-y^2} = \frac{81+16}{81-16}$

④ $\frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}} = \frac{3+2}{3-1}$

$\sqrt{x}$ | $\sqrt{y}$

3 | 2

3 | −2

$$\frac{a}{b} = \frac{11}{13}$$

$$\frac{3(x-3)}{3(4x+1)}$$

$$\frac{a+b}{a-b} = \frac{11+13}{11-13}$$

$$\frac{x}{y} = \frac{10}{3}$$

$$\frac{x+y}{x-y} = \frac{10+3}{10-3}$$

$$\frac{x}{y} = \frac{4}{6} \Rightarrow \frac{y}{x} = \frac{6}{4}$$

$$\frac{x+y}{x-y} = \frac{4+6}{4-6}$$

$$\frac{y+x}{y-x} = \frac{6+4}{6-4} = \checkmark$$

$$\frac{x+y}{x-y} = \frac{5}{2}$$

$$\frac{\frac{x}{y}+1}{\frac{x}{y}-1} = \frac{5}{2}$$

$$\frac{2x}{y} + 2 = 5\frac{x}{y} - 5$$

$$7 = 5\frac{x}{y} - 2\frac{x}{y}$$

$$\frac{x}{y} = \frac{5+2}{5-2} = \frac{7}{3}$$

$$\frac{x}{y} = \frac{7}{3}$$

$$\frac{A_1 + A_2}{A_1 - A_2} = \frac{8}{5}$$

$$\frac{A_1}{A_2} = \frac{8+5}{8-5} = \frac{13}{3}$$

$$\left(\frac{A_1}{A_2}\right)^2 = \frac{169}{9}$$

THANK YOU