

# YAKEEN NEET 2.0

2026

Basic Maths and Calculus (Mathematical Tools)

PHYSICS

Lecture - 08

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## Topics to be covered

- Straight line & Application



$$\# y = mx + c$$

अगर  $c = 0 \Rightarrow$  (st-line will pass from origin)

SSSQ

$$\rho = \frac{\text{Charge}}{\text{Vol}^n}$$

#

$$E = \frac{\rho r}{3\epsilon_0}$$

$$E = \frac{\rho}{3\epsilon_0} r$$

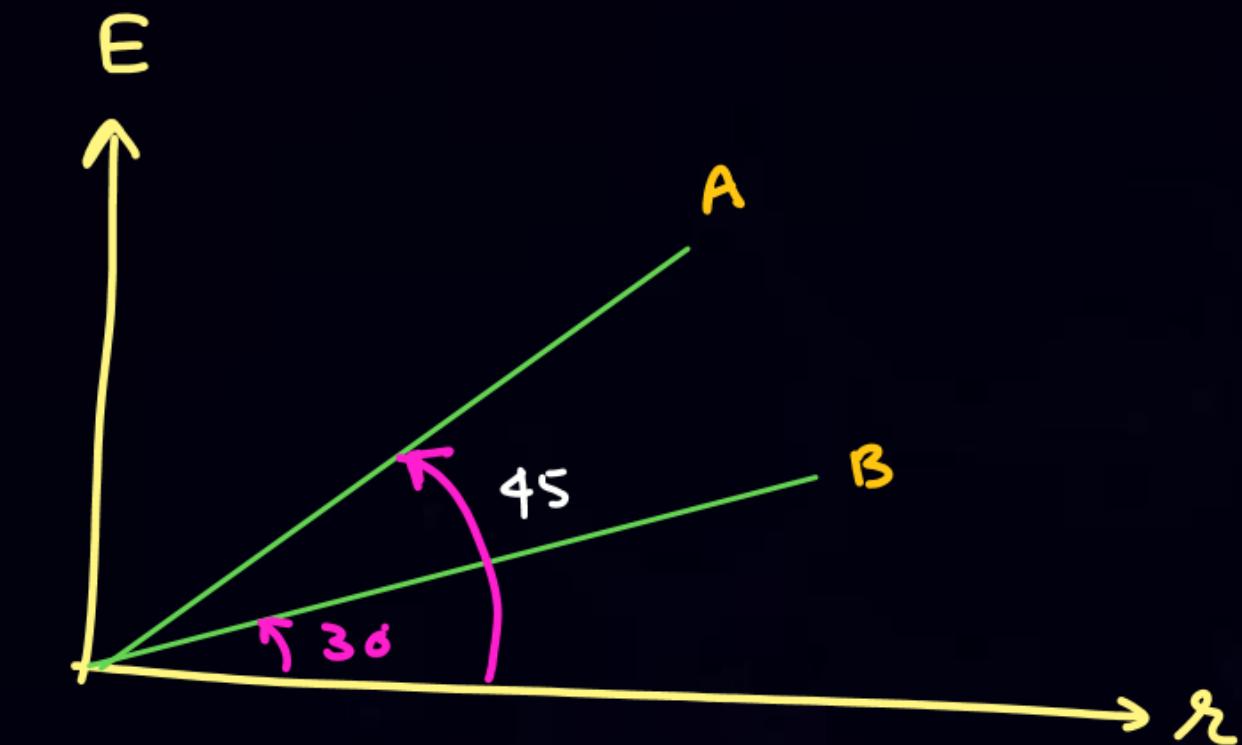
$$\gamma = m \propto$$

$$\text{slope} = \frac{\rho}{3\epsilon_0}$$

const

$$\frac{(\text{slope})_A}{(\text{slope})_B} = \frac{\tan 45^\circ}{\tan 30^\circ} = \frac{\rho_A}{\rho_B} = \frac{\theta_A \times \frac{4}{3}\pi R_B^3}{\frac{4}{3}\pi R_A^3 \times \theta_B}$$

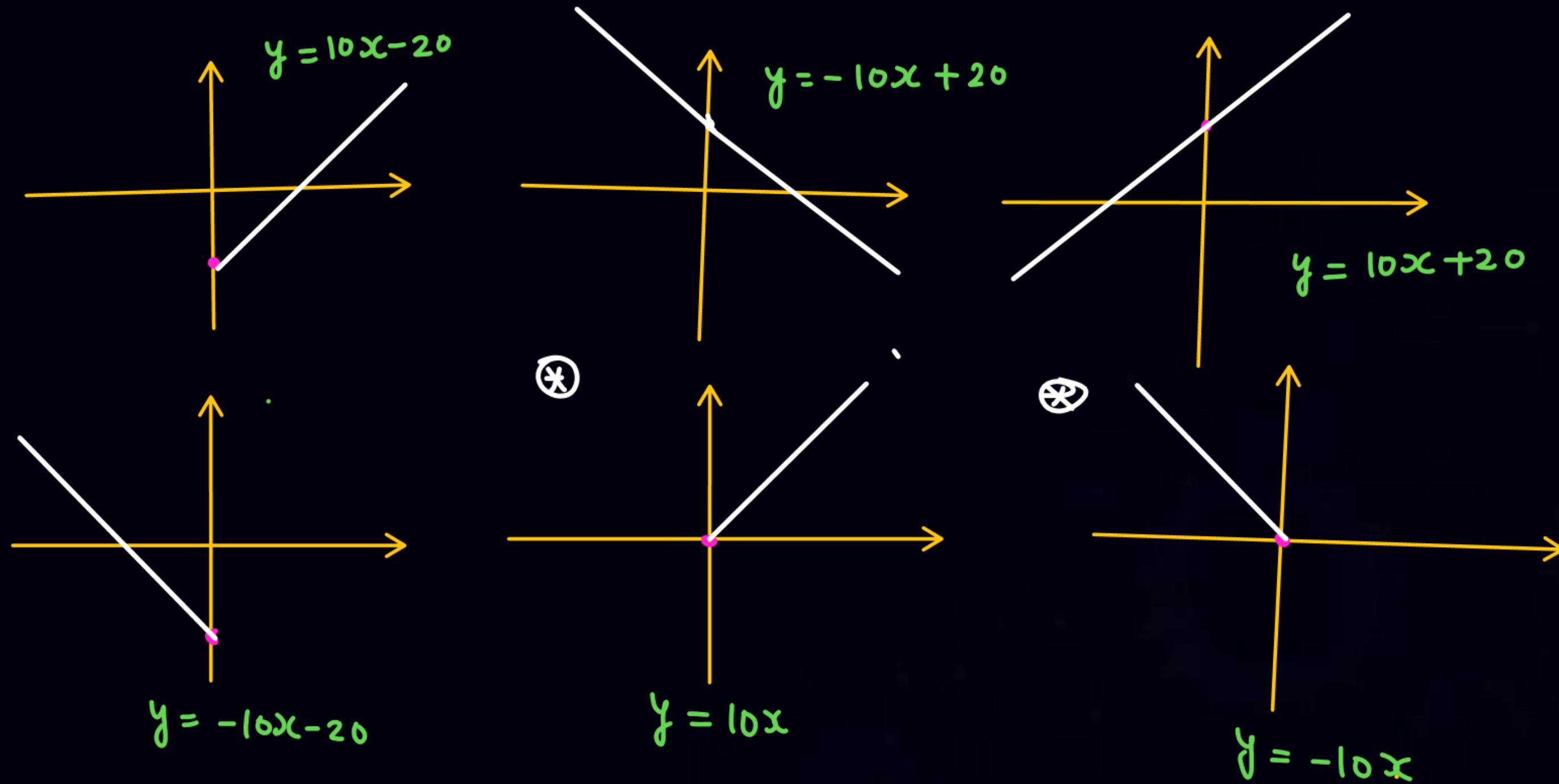
$$\frac{1}{1/\sqrt{3}} = \sqrt{3} = \frac{\theta_A}{\theta_B} \times \left(\frac{R_B}{R_A}\right)^3$$



$$\frac{r_A}{r_B} = 3$$

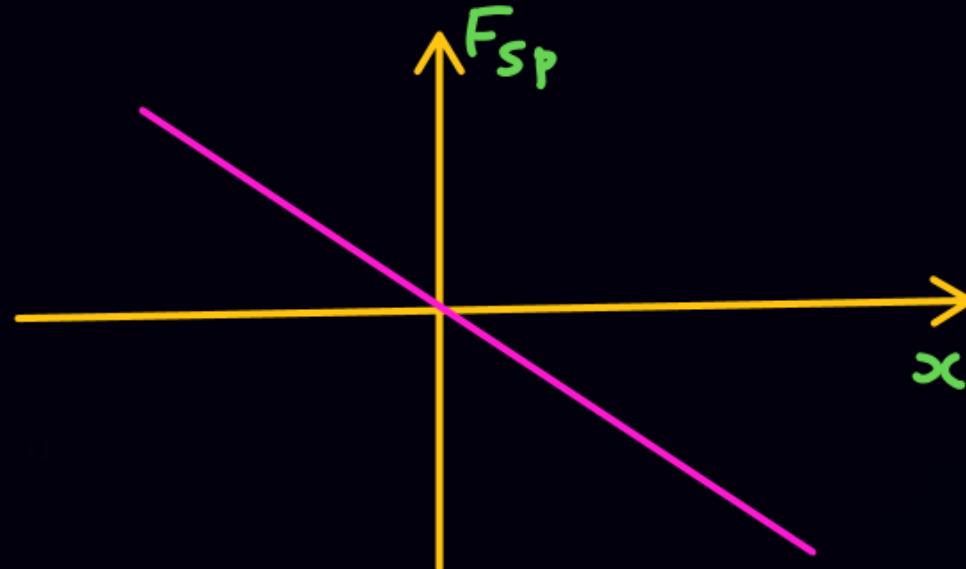
$$\sqrt{3} = \frac{\theta_A}{\theta_B} \left(\frac{1}{3}\right)^3$$

$$\frac{\theta_A}{\theta_B} = 27\sqrt{3}$$



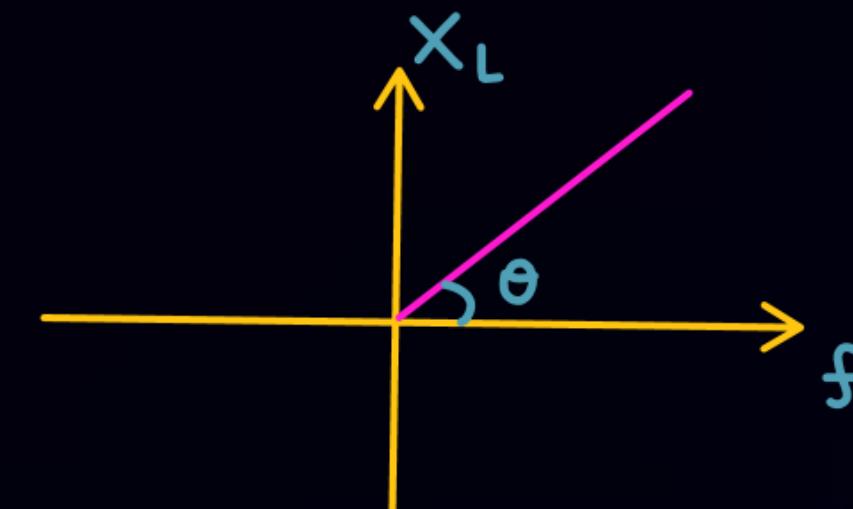
①

$$\vec{F}_{SP} = -k \vec{x}$$



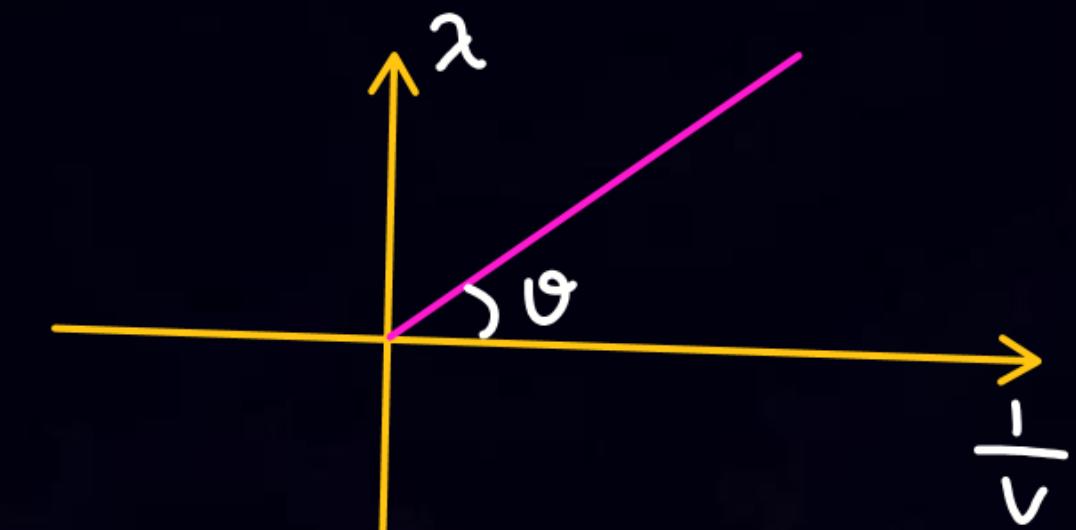
②

$$x_L = L 2\pi f$$



③

$$\lambda = \frac{h}{mv}$$



$$y = L 2\pi x$$

$$y = mx$$

$$\tan \theta = 2\pi L$$

$$\left. \begin{array}{l} y = \frac{h}{m} x \\ \tan \theta = \frac{h}{m} = \text{slope} \end{array} \right\}$$

#  $y = mx + c$

Q find the equation of straight passing through (2,3) having slope +10.

Sol  $m = 10, \quad y = 10x + c$

(2,3) से पास  $\Rightarrow 3 = 10 \times 2 + c$

$$c = 3 - 20 = -17$$

$$y = 10x - 17$$

Q. find the equation of straight passing through (4,5) having slope 2

Sol

$$y = mx + c$$

$$y = 2x + c$$

$$(4,5) \quad 5 = 2 \times 4 + c \Rightarrow 5 = 8 + c$$

$$\boxed{c = -3}$$

$$y = 2x - 3$$

Q. find the equation of straight passing through (2,0) having slope 4.

(2,0)

$$y = mx + c$$

$$y = 4x + c$$

$$0 = 4 \times 2 + c$$

$$\boxed{c = -8}$$

$$\boxed{y = 4x - 8}$$



#  $3x + 4y + 5 = 0$

 $y = mx + c$ 
 $4y = -3x - 5$ 

$y = -\frac{3}{4}x - \frac{5}{4}$

Slope =  $-\frac{3}{4}$   
 $c = -\frac{5}{4}$

#  $3x + 4y + 5 = 0$

Slope =  $-\frac{\text{coff. of } x}{\text{coff. of } y} = -\frac{3}{4}$

#  $4x + 3y + 10 = 0$

Slope =  $-\frac{\text{coff. of } x}{\text{coff. of } y} = -\frac{4}{3}$

#  $5x + 10y + 2 = 0$

Slope =  $-\frac{5}{10} = -\frac{1}{2}$

To find eq<sup>n</sup> of straight line if two points are given

Q. find equation of line passing through (2,3) and (4,5)

Sol<sup>n</sup>



$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 3}{4 - 2} = 1 = m$$

$$y = mx + c$$

$$y = x + c$$

(2, 3) से line pass करेगी

$$y = x + 1$$

$$3 = 2 + c$$

$$c = 1$$

SKC

#

Q

Find eq<sup>n</sup> of st. line passing through

(2, 2) and (5, 7)

Sol'  $m = \frac{7-2}{5-2} = \frac{5}{3}$

$$y = mx + c$$

$$y = \frac{5}{3}x + c$$

$$2 = \frac{5}{3} \times 2 + c$$

$$c = 2 - \frac{10}{3} = -\frac{4}{3}$$

$$y = \frac{5x}{3} - \frac{4}{3}$$

your choice



$$(x_1, y_1) \rightarrow (x_2, y_2)$$

$$y - y_1 = (\text{slope})(x - x_1)$$

Q  $\dot{(2, 2)} \quad \dot{(5, 7)}$

$$\text{slope} = \frac{7-2}{5-2} = \frac{5}{3}$$

$$y - 2 = \frac{5}{3}(x - 2)$$

$$y - 2 = \frac{5x}{3} - \frac{10}{3}$$

$$y = \frac{5x}{3} - \frac{10}{3} + 2$$

$$y = \frac{5x}{3} - \frac{4}{3}$$



$$\theta_3 > \theta_2 > \theta_1$$

$$\tan \theta_3 > \tan \theta_2 > \tan \theta_1$$

$$(\text{slope})_3 > (\text{slope})_2 > (\text{slope})_1$$

Q position vs time का slope velocity है



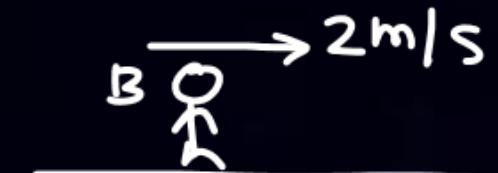
A slope = -5

velocity of A = -5  
Velocity of B = 2

maths

$$2 > -5$$

$$(\text{slope})_B > (\text{slope})_A$$



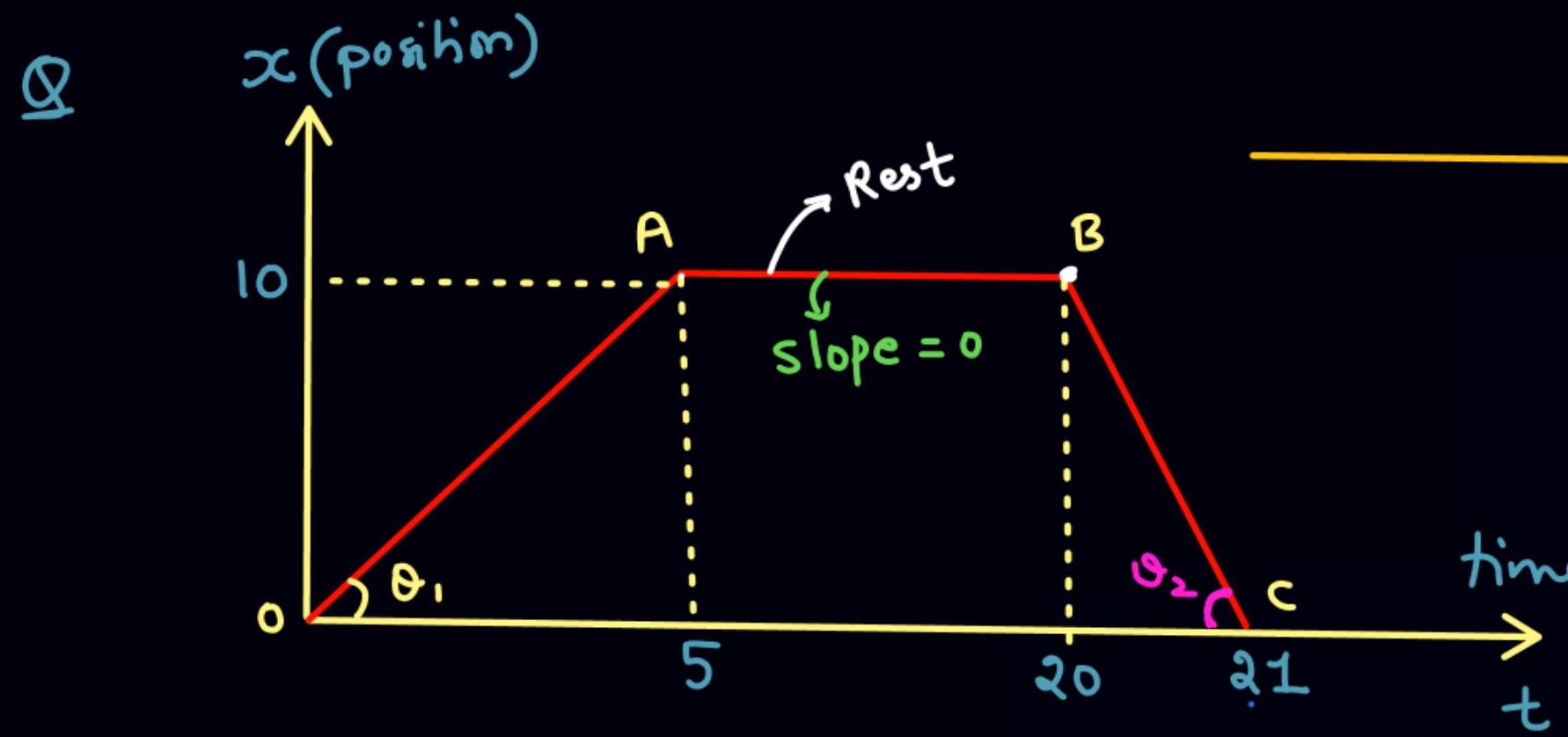
A is faster

\* Slope के magnitude से मतलब है

$$|\text{slope}|_A > |\text{slope}|_B$$

$$V_A > V_B$$

A particle starts motion from origin at  $t=0$ , s.t it moves on  $x$ -Axis

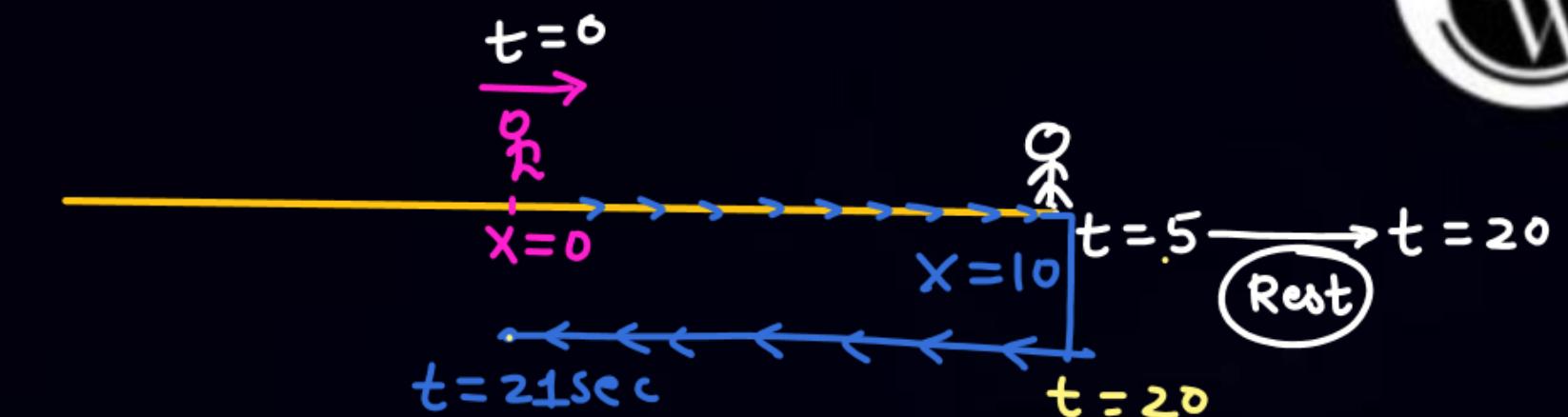


$(0 \rightarrow A)$

$$\tan \theta_1 = \frac{10}{5} = 2 = \text{slope} = \text{velocity}$$

$(A \rightarrow B)$ , velocity = 0, slope = 0,

$\boxed{x=0}$



$(x-t)$  graph का slope  
velocity होता है

$(B \rightarrow C) (t = 20 \text{ to } t = 21)$

$$\text{slope} = -\frac{10}{1} = -10$$

## photoelectric effect

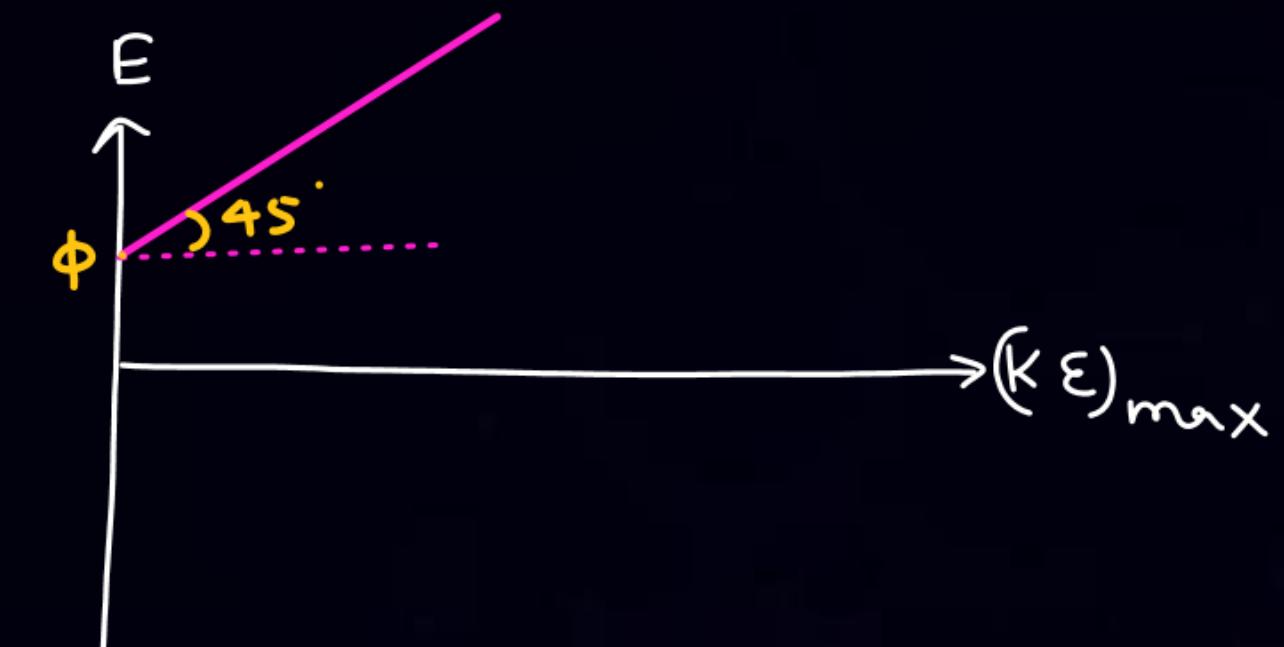
$$E = \phi + (KE)_{\max}$$

Energy of one photon

$$E = h\nu = \frac{hc}{\lambda}$$

$\phi \rightarrow \text{const}$  (material की property)

$\phi > 0$



$$E = \phi + (KE)_{\max}$$

$$y = c + xc$$

$$y = x + c$$

## photoelectric effect

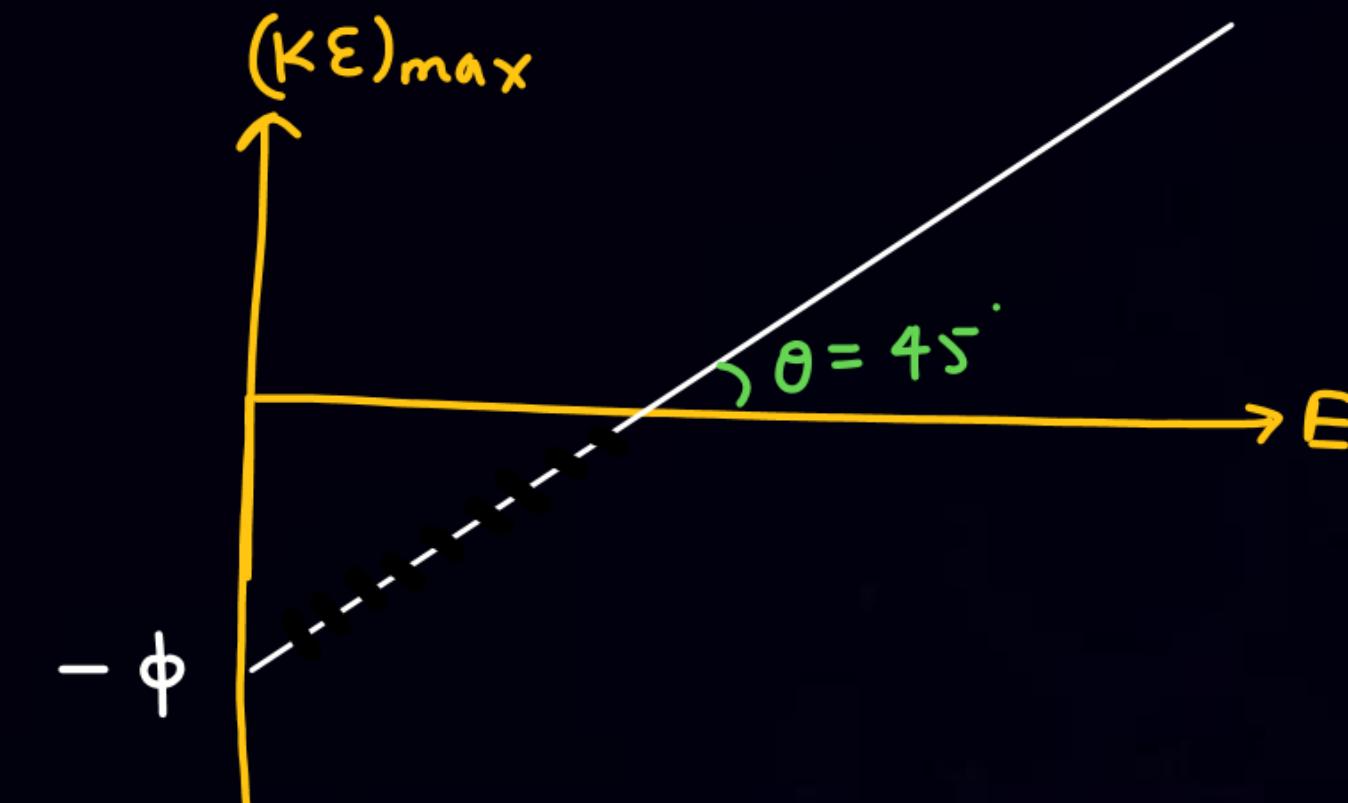
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Energy of one photon

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$$\phi > 0$$



$$E = \phi + (KE)_{\max}$$

$$x = \phi + y$$

$$y = x - \phi$$

$$\text{slope} \equiv 1$$

$$\tan \theta = 1$$

$$\theta = 45^\circ$$

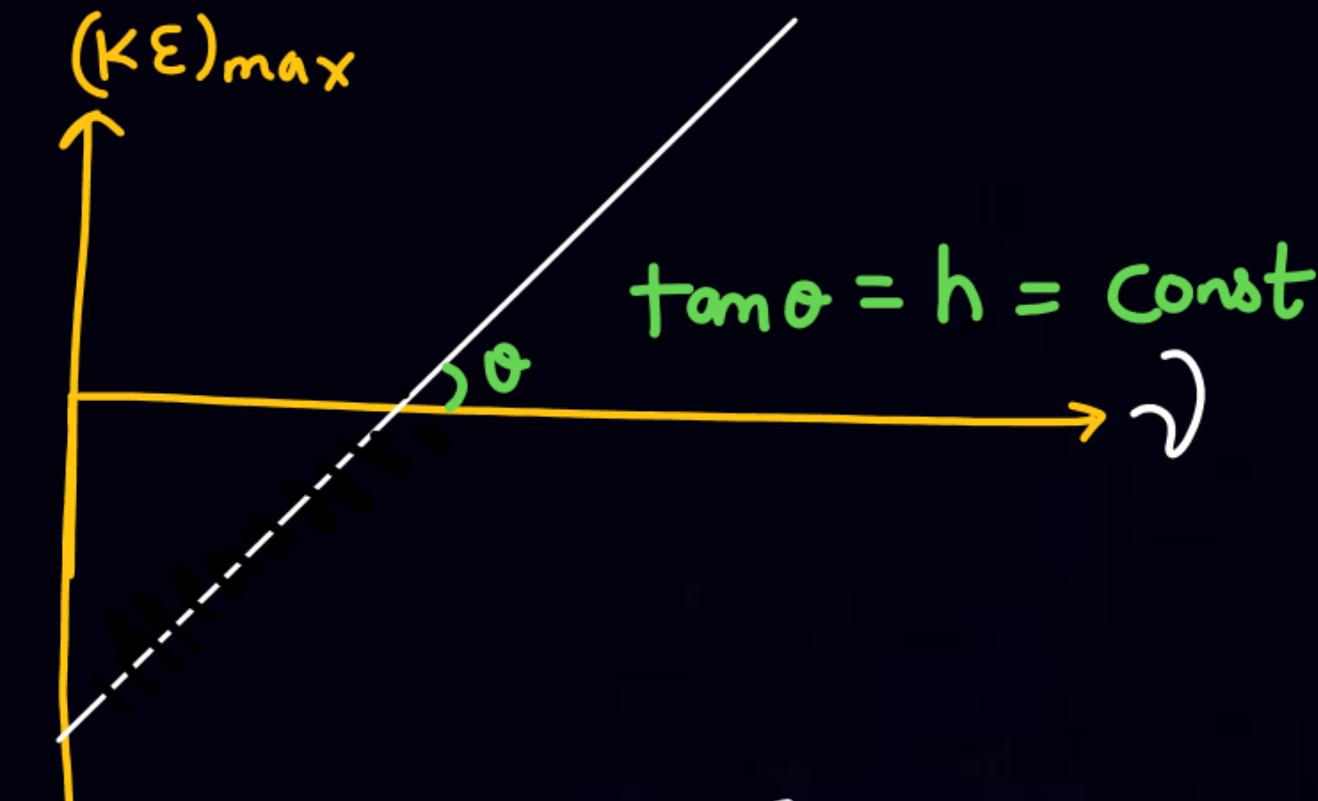
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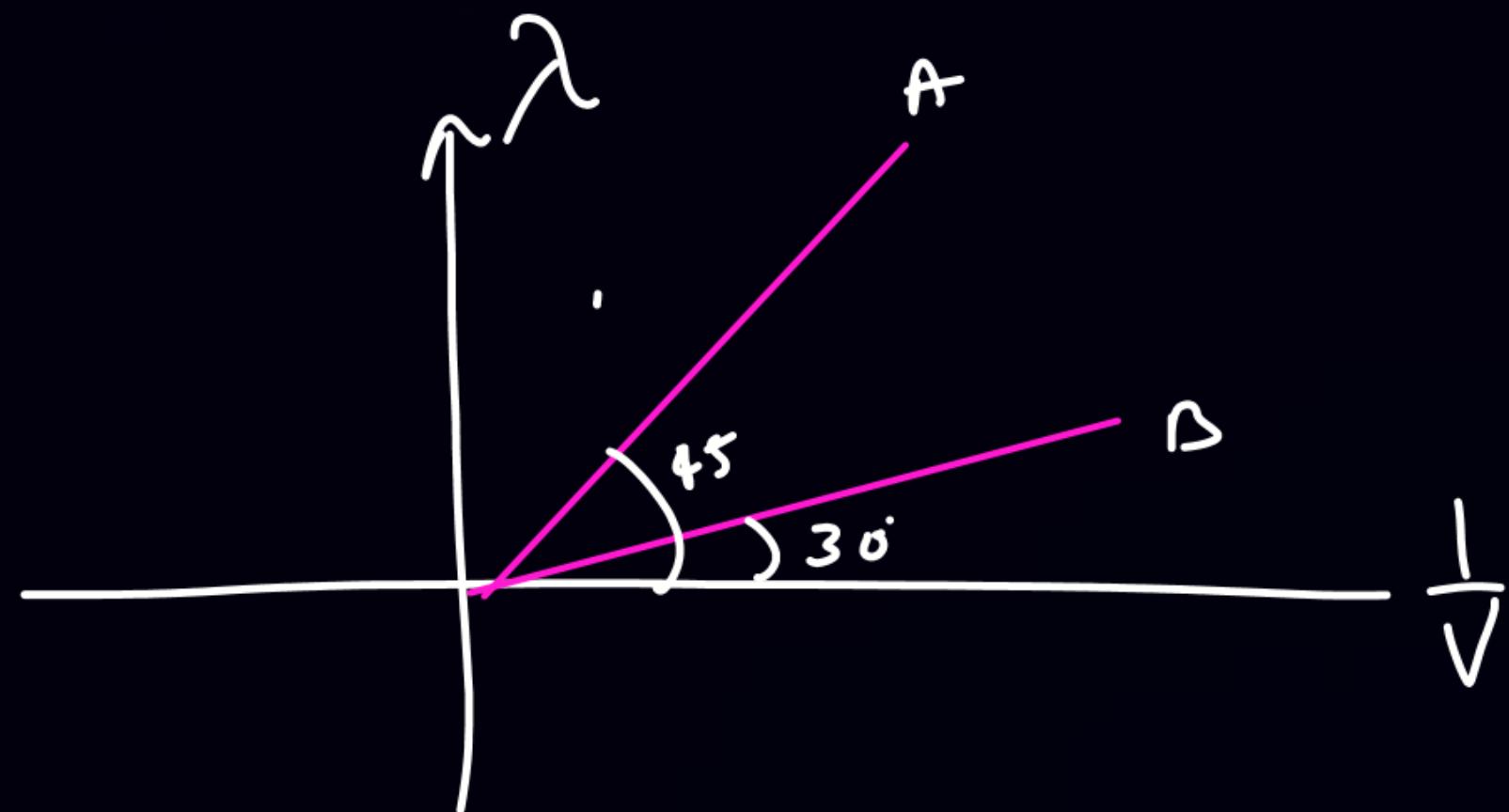


$$h\nu = \phi + (KE)_{\max}$$

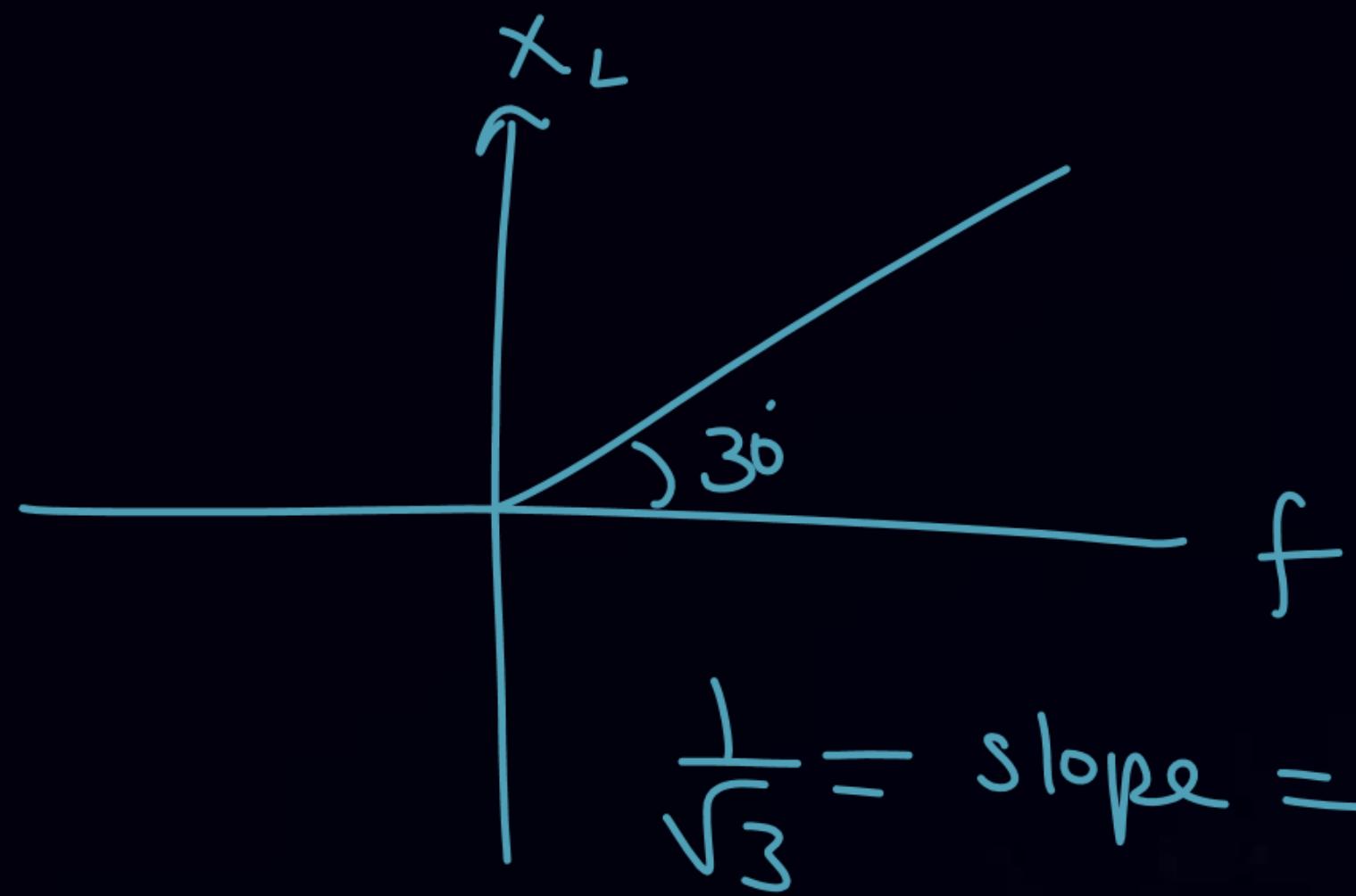
$$h\nu = \phi + y$$

$$y = h\nu - \phi$$

$$\text{slope} = h = \tan \theta$$



$$\frac{m_A}{m_B} = \frac{\text{(slope)}_B}{\text{(slope)}_A} = \frac{\frac{1}{\sqrt{3}}}{1} = \frac{1}{\sqrt{3}}$$



$L = ?$

$$x_L = L 2\pi f$$

$$y = m x$$

$$\frac{L}{R}$$

$$L = \frac{1}{2\pi\sqrt{3}}$$



## HomeWork

- DPP
- module (Prayonthon  
1-6  
(15, 16, 17))





module homework

Tuesday → Prasanth => 1-6

**THANK  
YOU**