YAKEEN NEET 2.0

2026

Basic Maths and Calculus (Mathematical Tools)

Physics | Lecture - 7

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Topics to be covered

1. Stowish line
2.
3.
4.

Recap of previous lecture

1
2
3
4

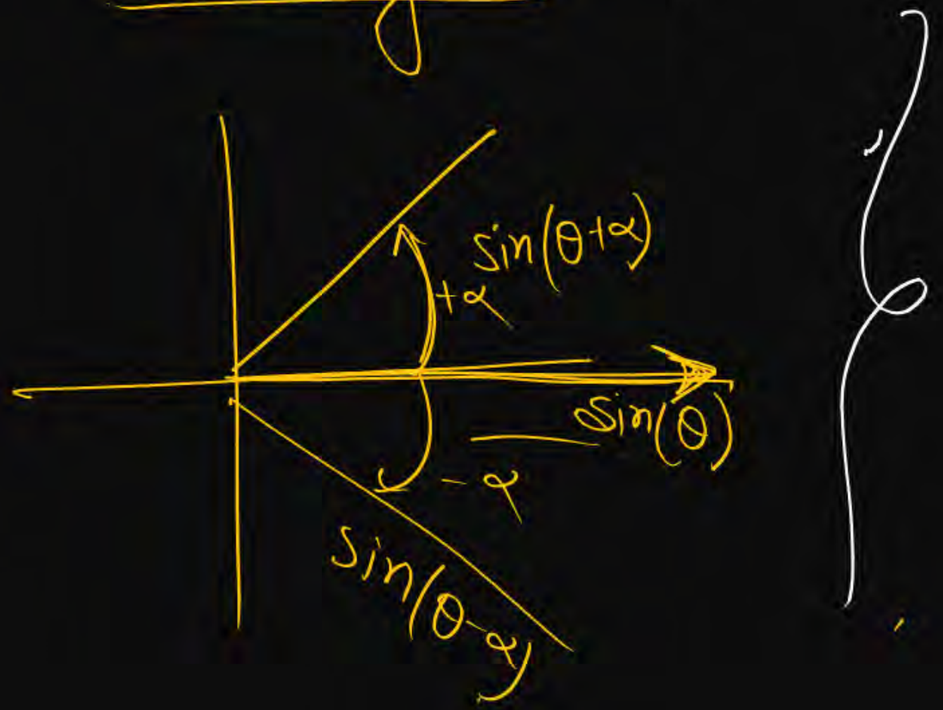
Phase

$y = A\sin(\omega t + \phi)$

ϕ = initial phase at $t=0$

Angle = Phase

Phasor diagram



G.P series

a (1st ten), ar, ar^2, ar^3, ar^4 ...

n^{th} term / $(n-1)^{th}$ ter $= r$ = c.r

$$\text{Sum of } n\text{-ten} = \frac{a}{1-cr}$$

Ques $cr<1$

a, $a+d$, $a+2d$, $a+3d$, $a+4d$ ...

$d = n^{th} - (n-1)^{th}$

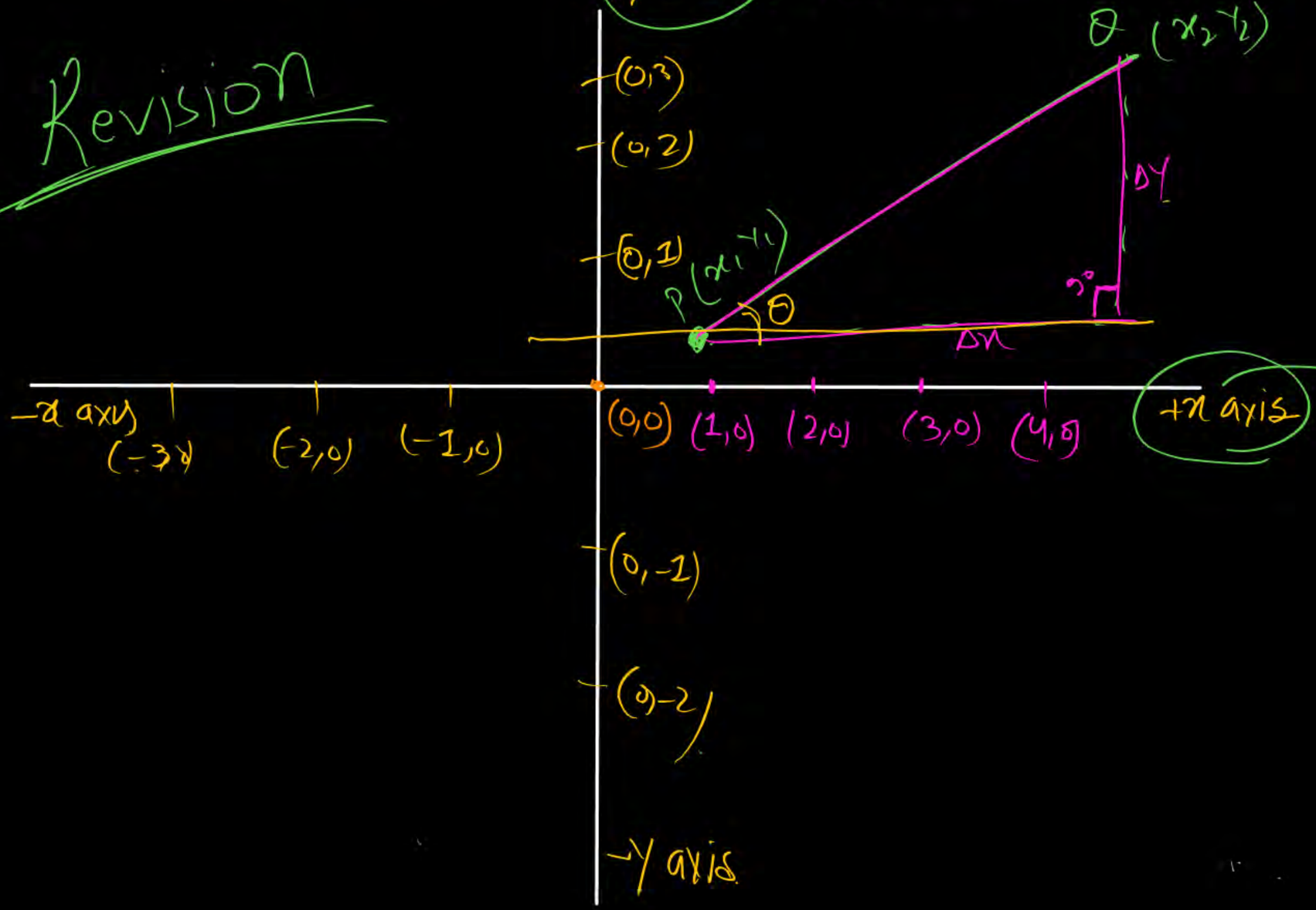
$\text{Sum} = \frac{n}{2}\left(2^{st}\text{ term} + n^{th}\right)$

Straight line

(a) yes
(b) NO

+y axis = value of x-coordinate is zero

Revision

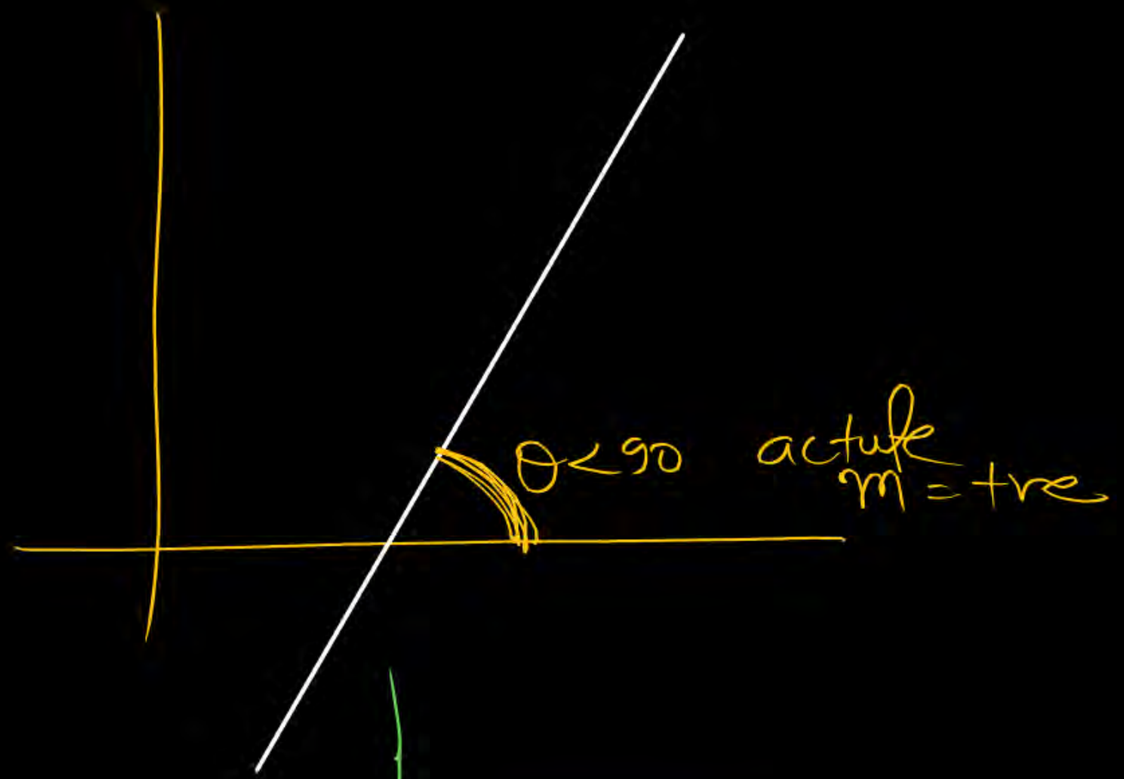


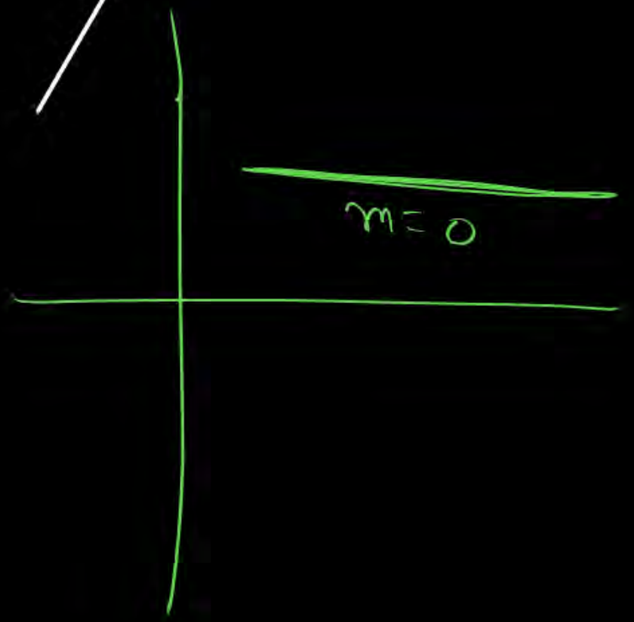
$$PQ = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

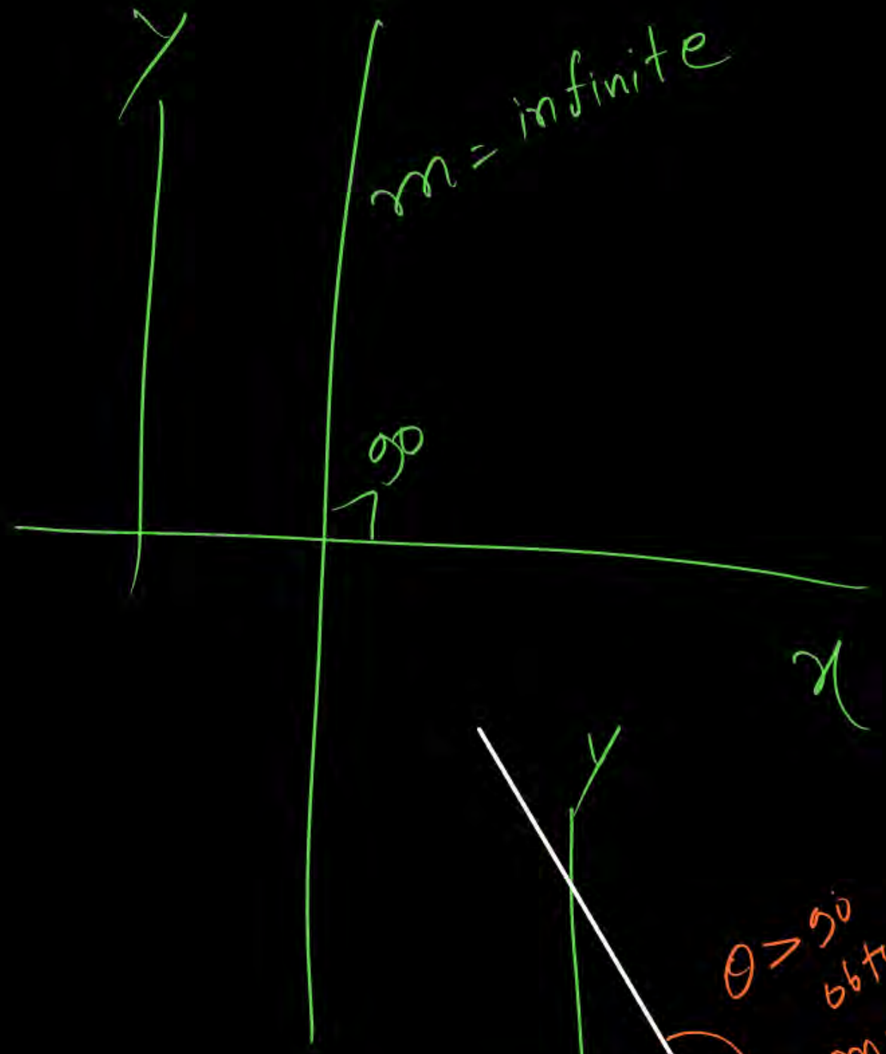
$$m = \frac{\Delta y}{\Delta x} = \tan\theta = \frac{y_2-y_1}{x_2-x_1}$$

slope

Value of y^{th} co-ordin is zero

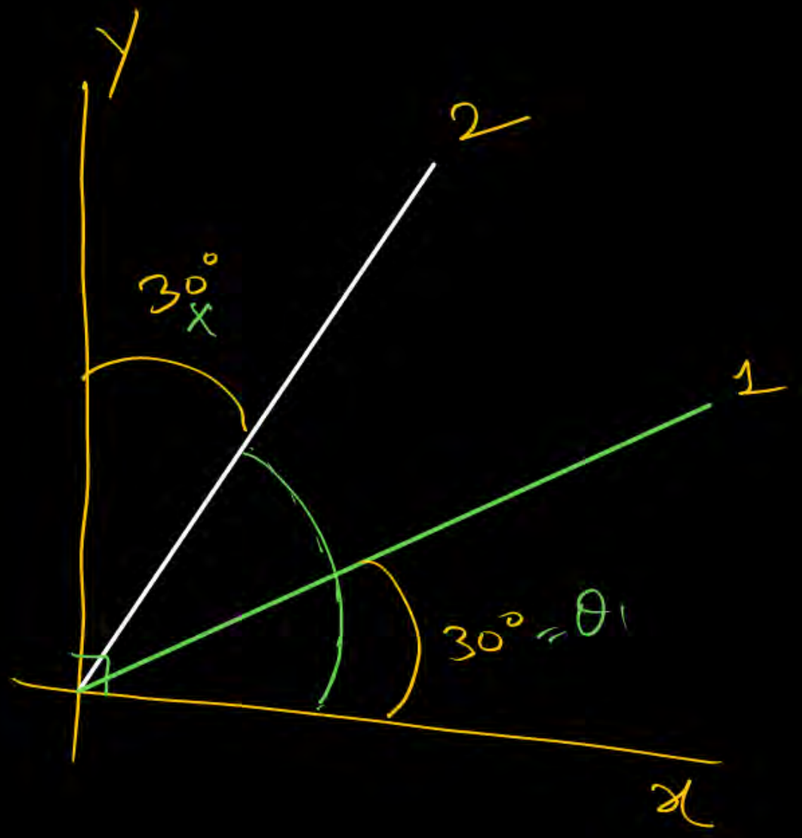

θ<90 actute
m = +ve


m = 0


y
m = infinite
90
x

y
θ>90
obtuse
m = -ve
x

H/W

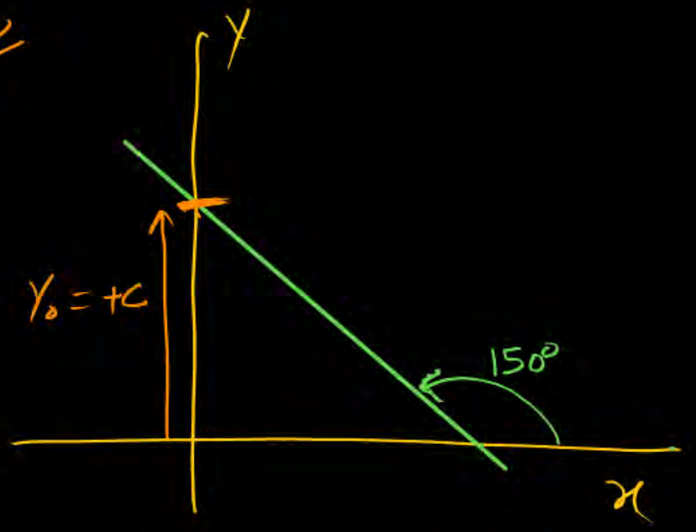


$$Slope_1 = \tan\theta_1 = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$Slope_2 = \tan\theta_2 = \tan 60^\circ = \sqrt{3}$$

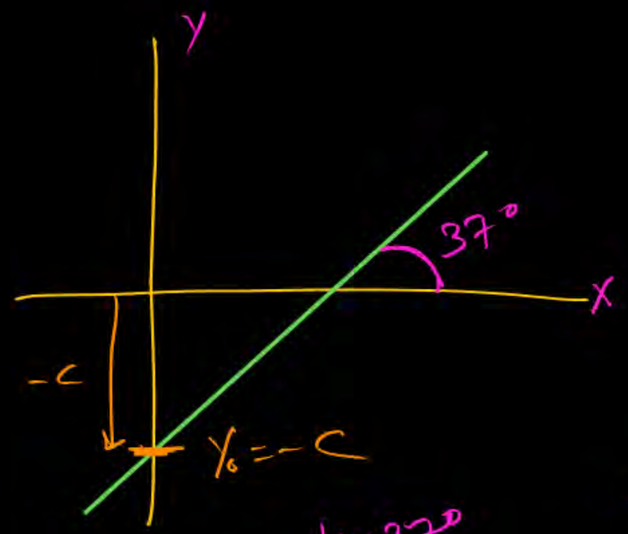
$$\frac{Slope_1}{Slope_2} = \frac{1}{\sqrt{3} \times \sqrt{3}} = \frac{1}{3}$$

Notes में लिखो



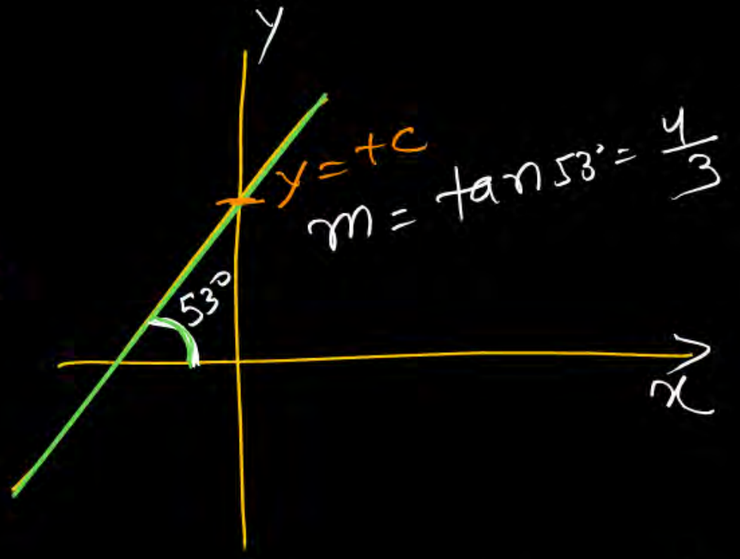
$m = \tan 150°$

$m = -\frac{1}{\sqrt{3}}$



$m = \tan 37°$

$= \frac{3}{4}$



MP* Box

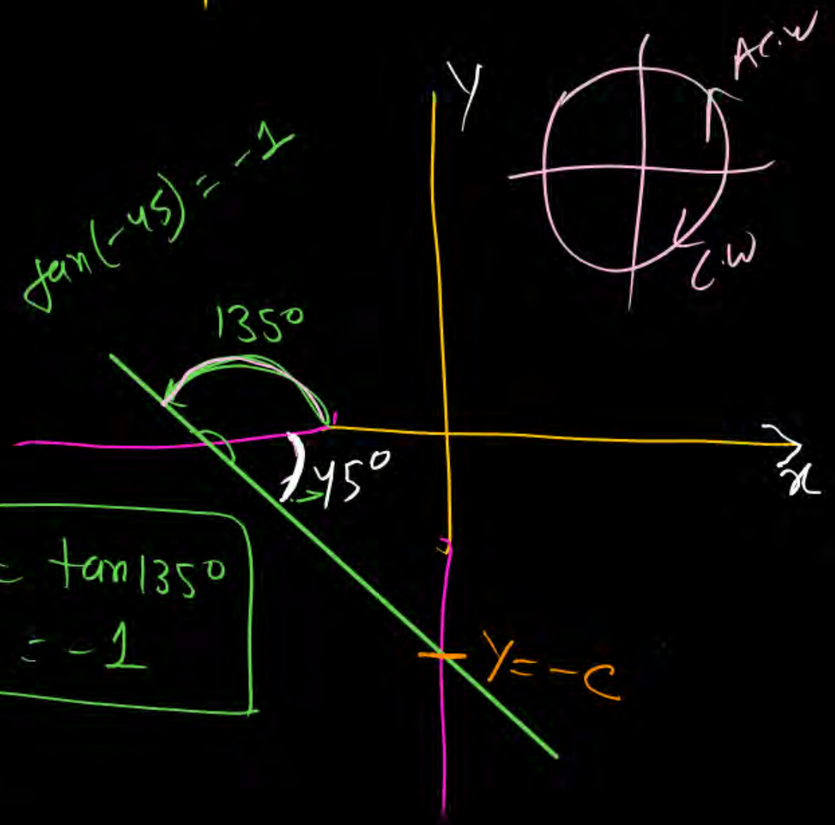
$m = \tan\theta$

↳ Angle b/w straight line & +ve X-axis in anti-clock direction

#

$m = \tan 135°$

$= -1$



equation of straight line

$$\text{dist}^{n}(PQ) = \sqrt{(Y-Y_0)^2 + (x-0)^2}$$

Derivation of eqn of straight line

$$(\text{Slope})_{PQ} = m = \frac{Y-Y_0}{x-0}$$

$$m = \frac{Y-Y_0}{x}$$

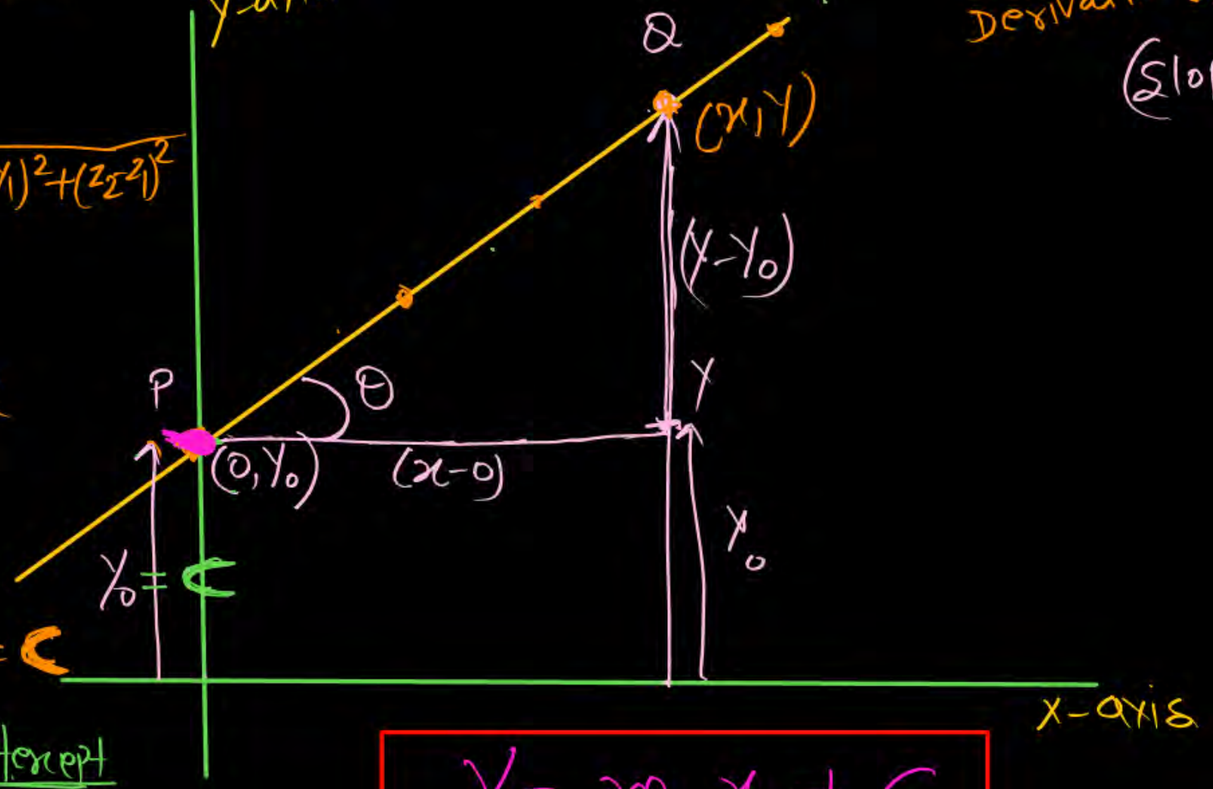
$$mx = Y-Y_0$$

$$\boxed{Y = mx + Y_0}$$ Put $Y_0 = C$

$$\boxed{Y = mx + C}$$

* gf all three co-ordinate are given.

$$(\text{dist}^{n})_{PQ} = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2 + (z_2-z_1)^2}$$



* gf value of x is zero then value of y^{th} co-ordinate $Y_0 = C$

$(Y_0 = C)$ y^{th} Intercept

$$\boxed{Y = mx + C}$$

* Straight line eqn ka ek hi (mara), m & C fixed ho hamara
* $\rightarrow m = \text{slope} = \tan\theta$
* $C = y^{th}$ Intercept (value of Y when $x=0$)

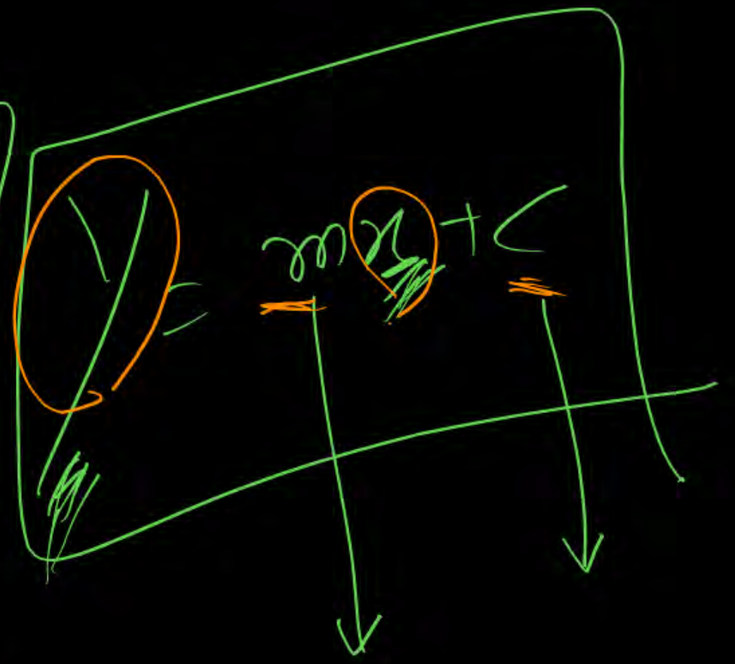
gf $x=0$

$Y = mY_0 + C$

$Y = C$

MR ka BOL

Straigh line kahta hai tum mujhe mera m, c do, mai tumhe Kisi bhi Point ka (x, y) dunga.



Write equation of straight line given graph :-

$m = \tan 53^\circ = \frac{4}{3}$ ✓✓

$c = 4$

Putting value of c, & m ✓

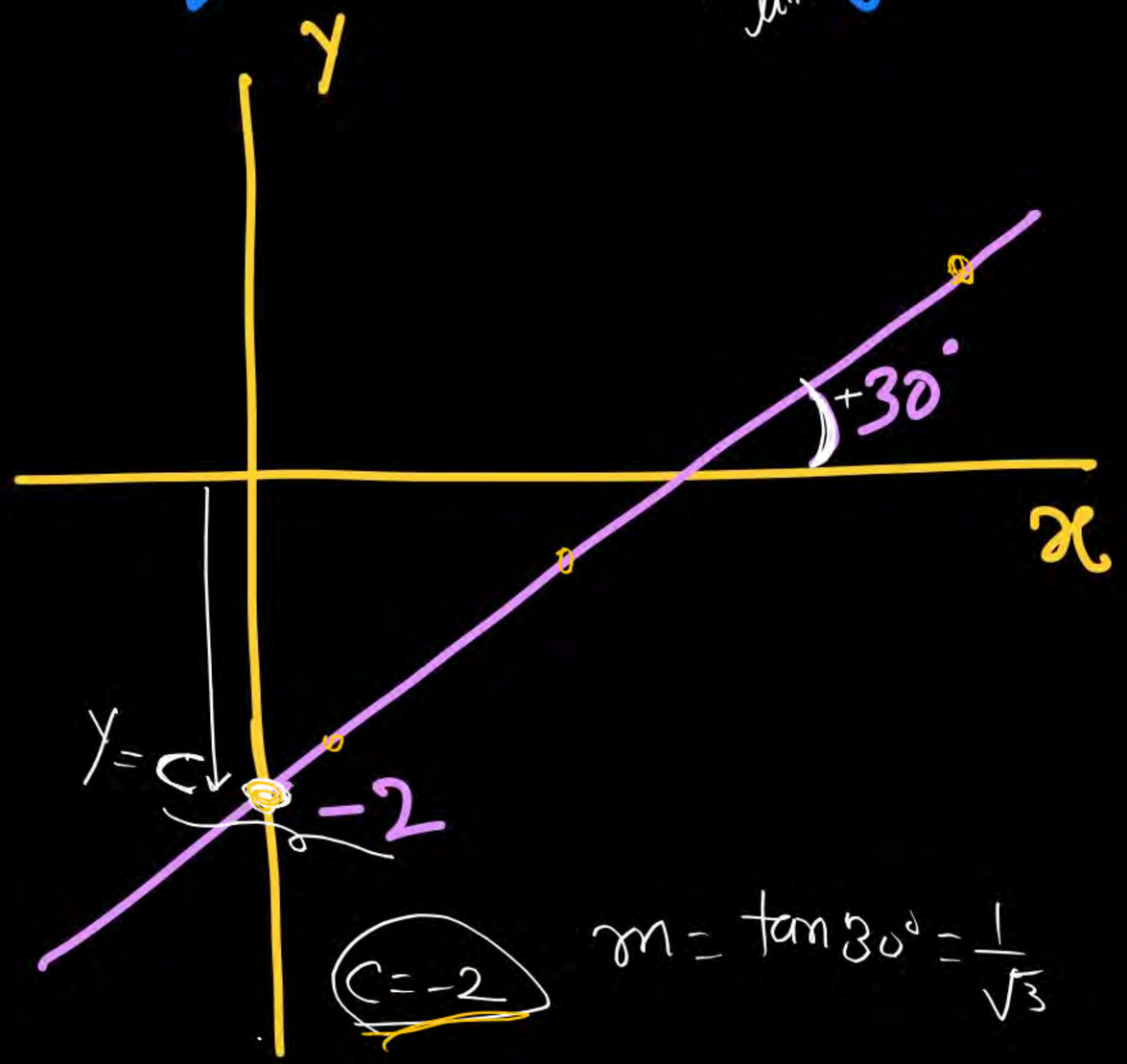
$y = mx + c$ ← y=mx+c

$y = \left(\frac{4}{3}\right)x + 4$

↳ general equation

$y = mx + c$

Write equation of straight line given graph :-



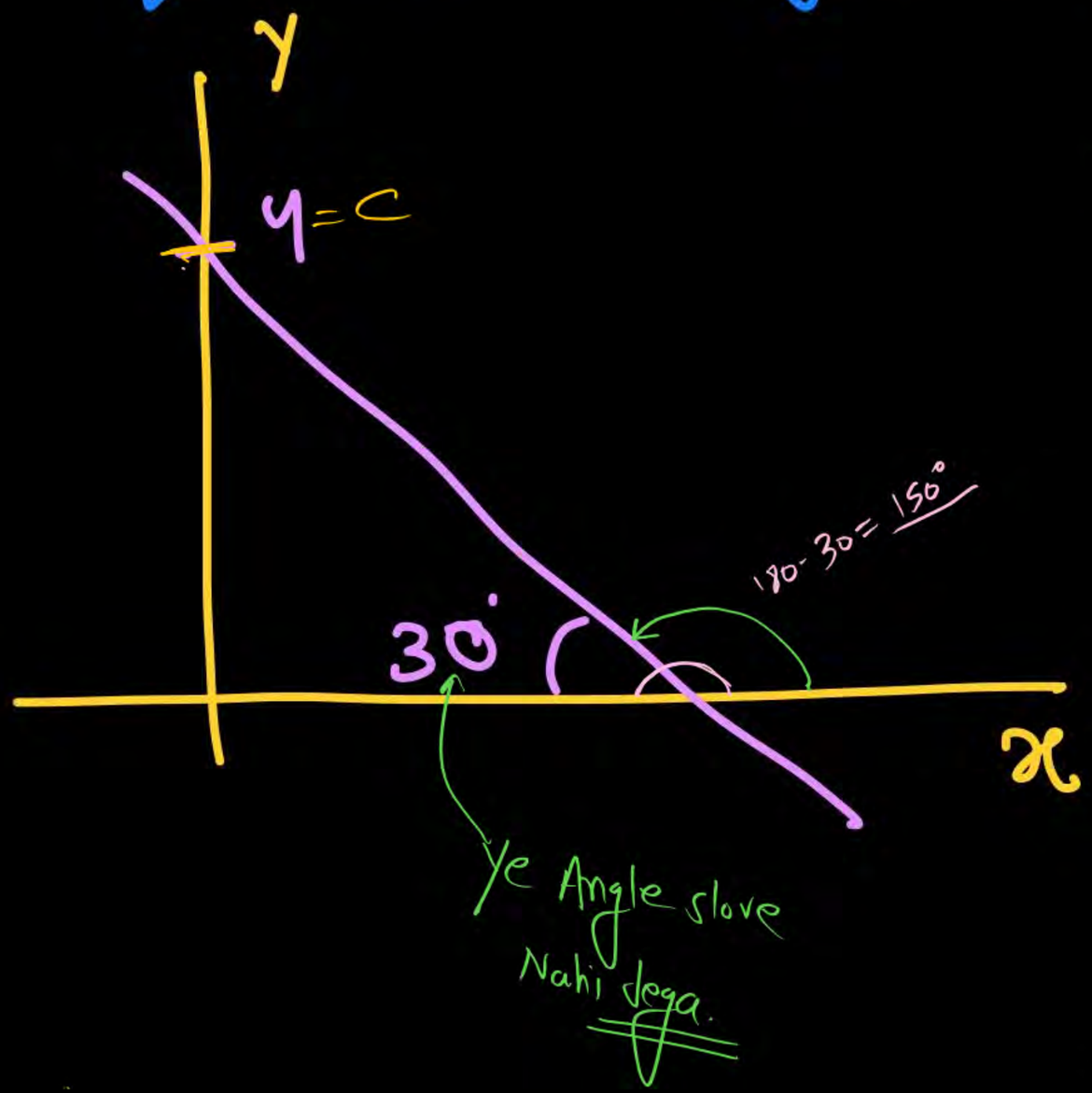
$C = -2$

$m = \tan 30^\circ = \frac{1}{\sqrt{3}}$

$y = mx + c$

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

Write equation of given graph :-



$m = \tan(180-30)$

$= \tan(150) = -\frac{1}{\sqrt{3}}$

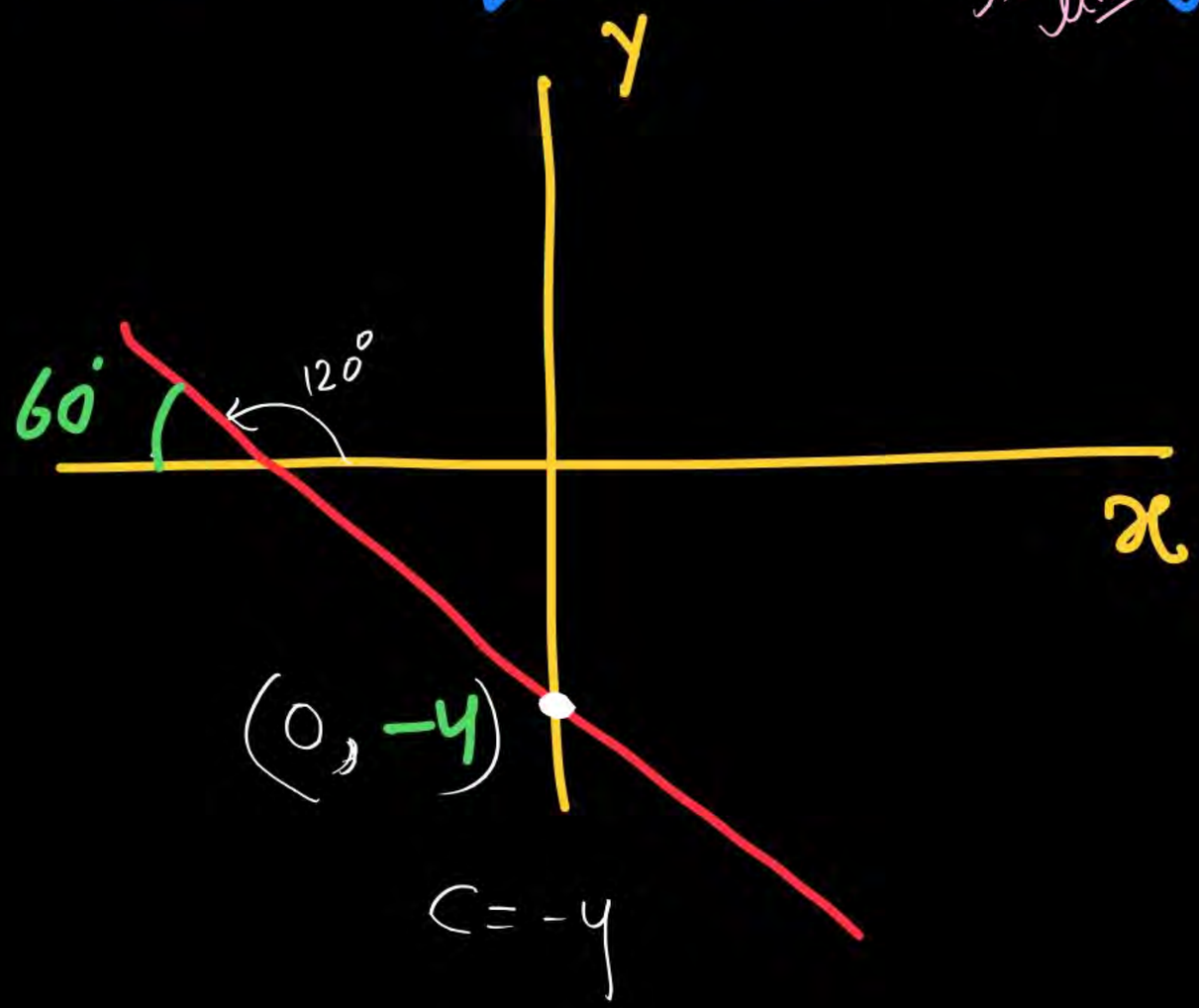
$C = 4$

$y = mx + C$

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

Ans

Write equation of straight line given graph :-



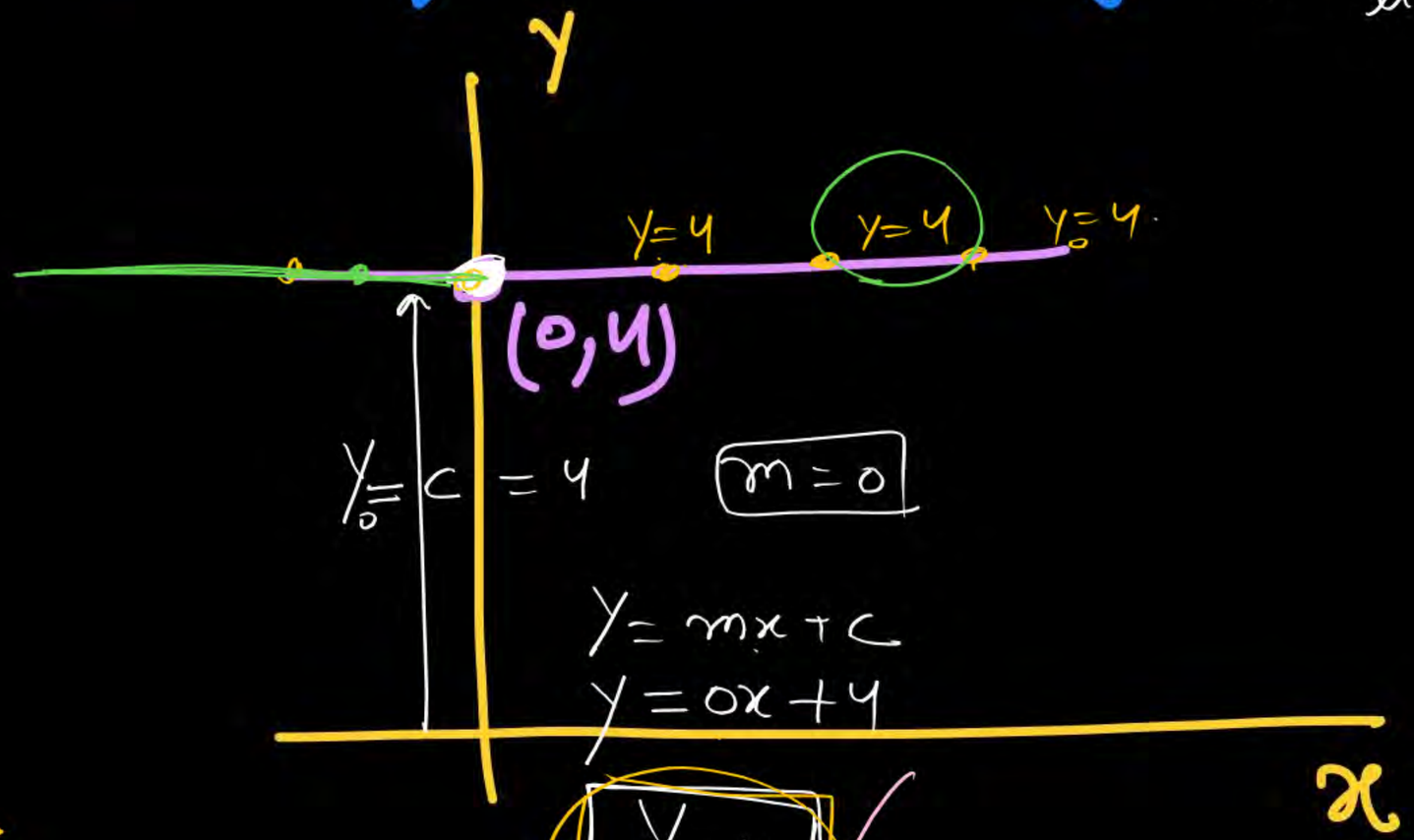
Soln

$m = \tan\theta = \tan(120) = -\sqrt{3}$

$y = mx + c$

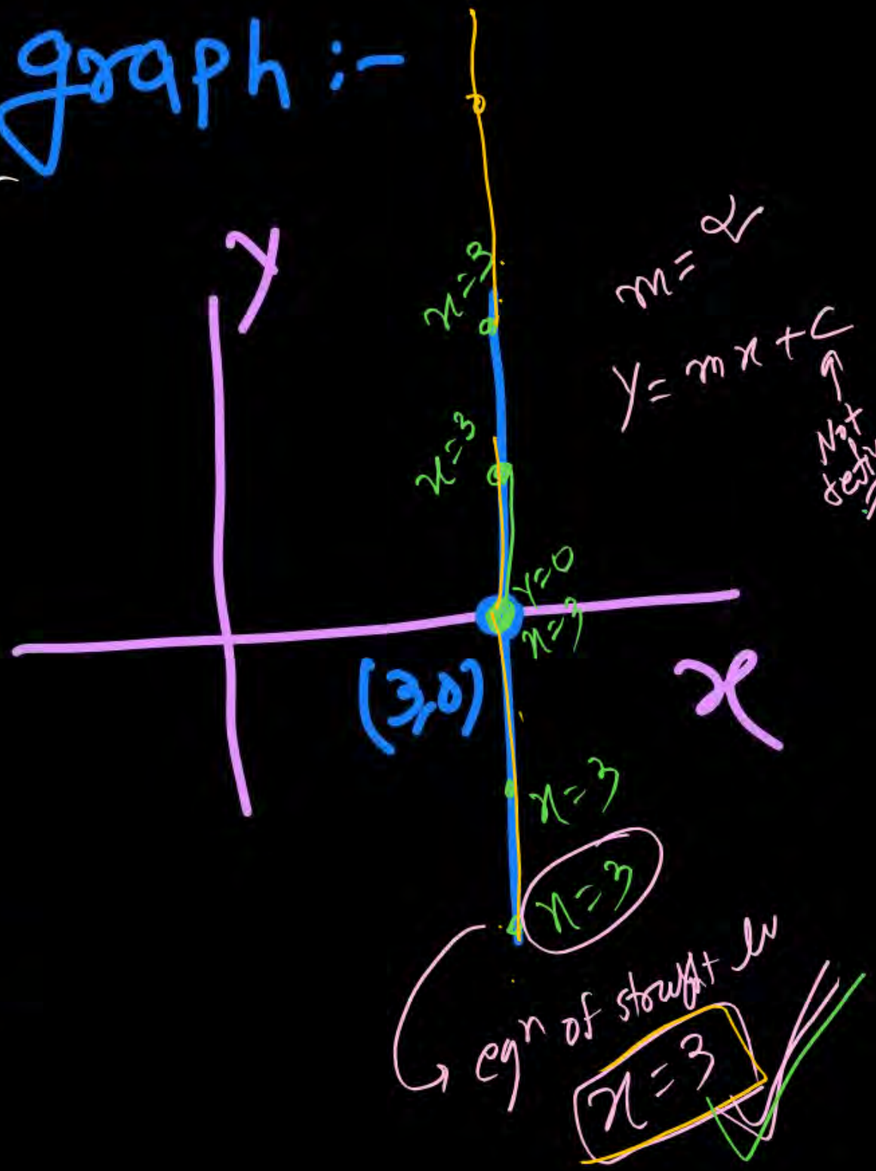
$y = -\sqrt{3}x - 4$

Write equation of given straight line graph :-



$y = 4$ ✓

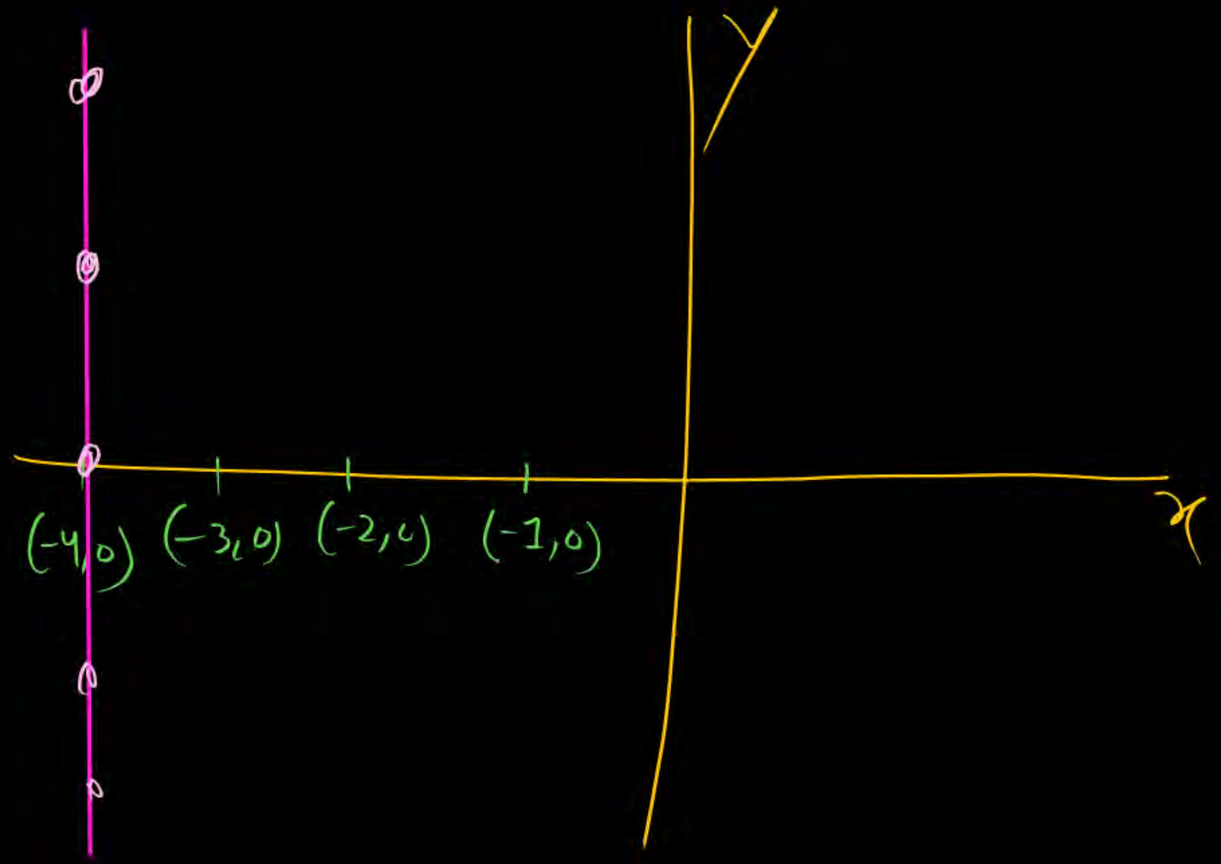
↳ fixed value of y.



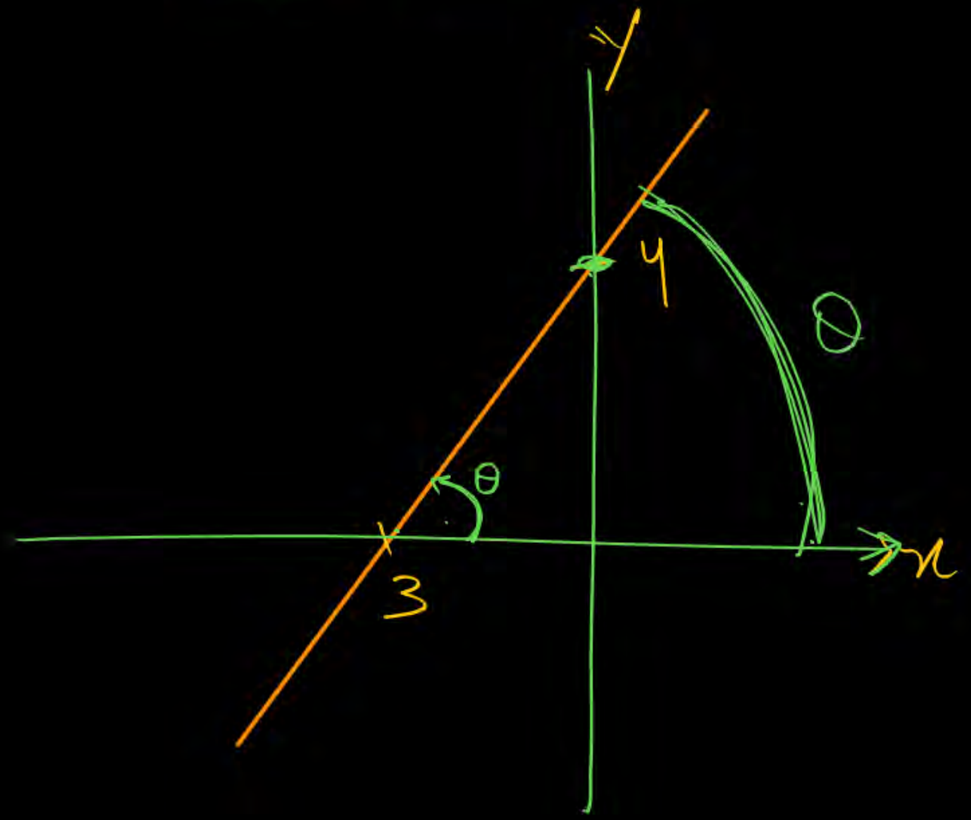
↳ eqn of straight line

$x = 3$ ✓

Draw $x = -4$



Write eqn of straight line

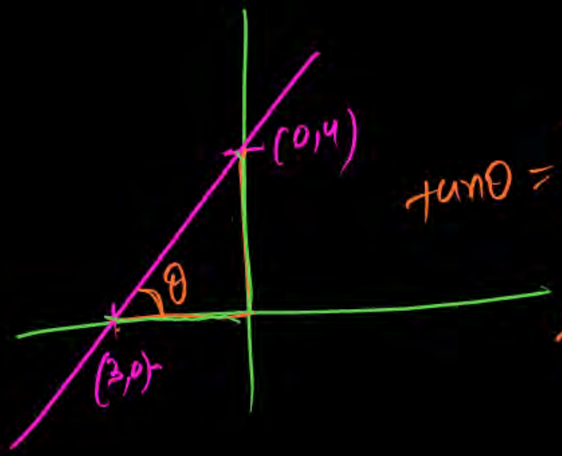


Soln $Y_0 = C = 4$

Slope $= \frac{4}{3}$

$Y = mx + C$

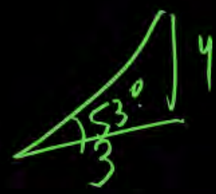
$\boxed{Y = \frac{4}{3}x + 4}$

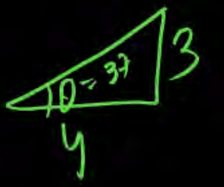


$\tan\theta = \frac{4}{3}$

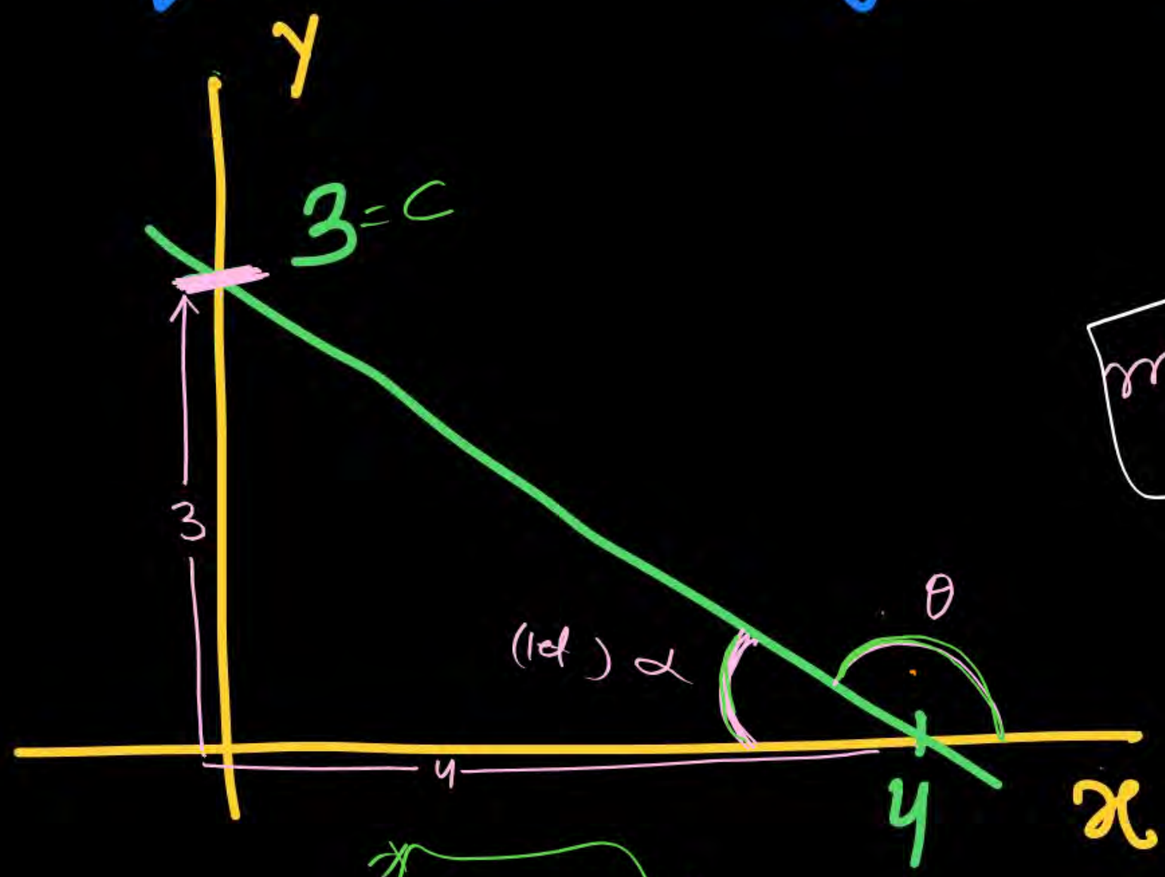
$\tan\theta = \frac{4}{3}$

$\theta = 53°$





Write equation of given graph :-

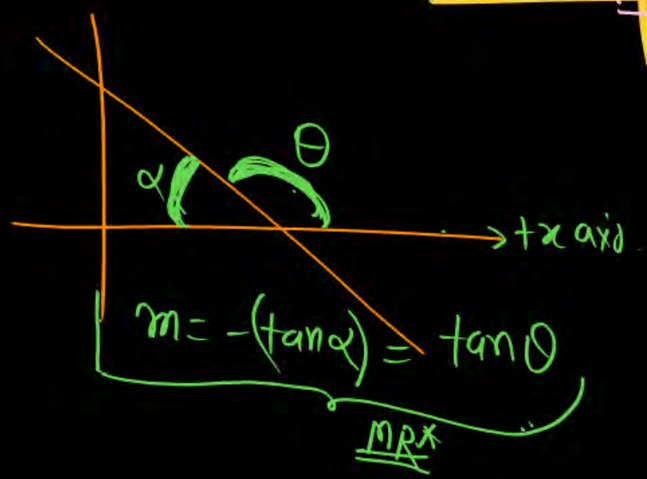


$c = +3$

$m = \tan\theta = \tan(143^\circ) = -\frac{3}{4}$

$y = mx + c$

$y = -\frac{3}{4}x + 3$ Ans



$\tan\alpha = \frac{3}{4}$

$\alpha = 37^\circ$

$\theta = 180 - 37 = 143^\circ$

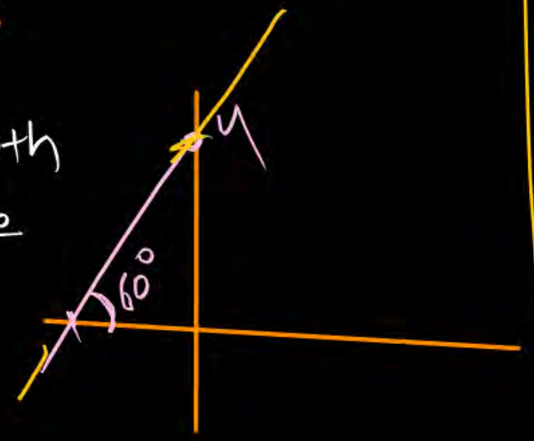
Physics mcq
Basic mcq now
Daily challenge
Questio

Draw Graph b/w y & x For given equation.

(i) $y = \sqrt{3}x + 4$

Soln Compair this eqn with eqn of straight line

$y = mx + c$



$c = 4$ $\quad m = \tan\theta = \sqrt{3}$

$\theta = 60°$

(ii) $y = x$ given equat.

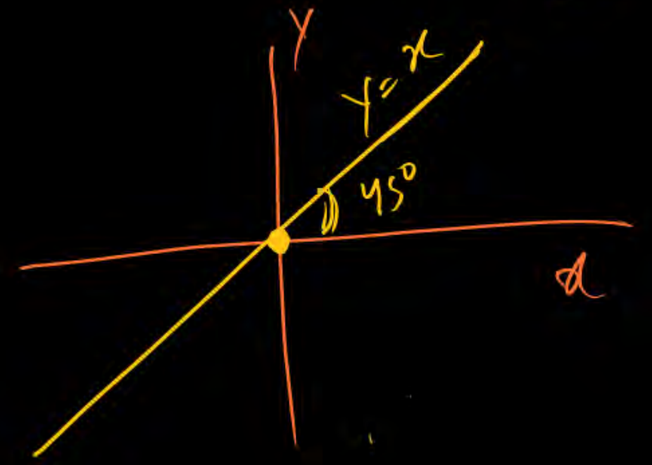
Compair it with eqn of stra

$y = mx + c$

$c = 0$

$m = 1 = \tan\theta$

$\theta = 45°$



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

Draw graph b/w y & x

Soln

$y = mx + c$

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

$c = -5 \quad m = \frac{4}{3} = \tan\theta$

$\theta = 53^\circ$ ✓

(iv) $y = -x$

Draw graph.

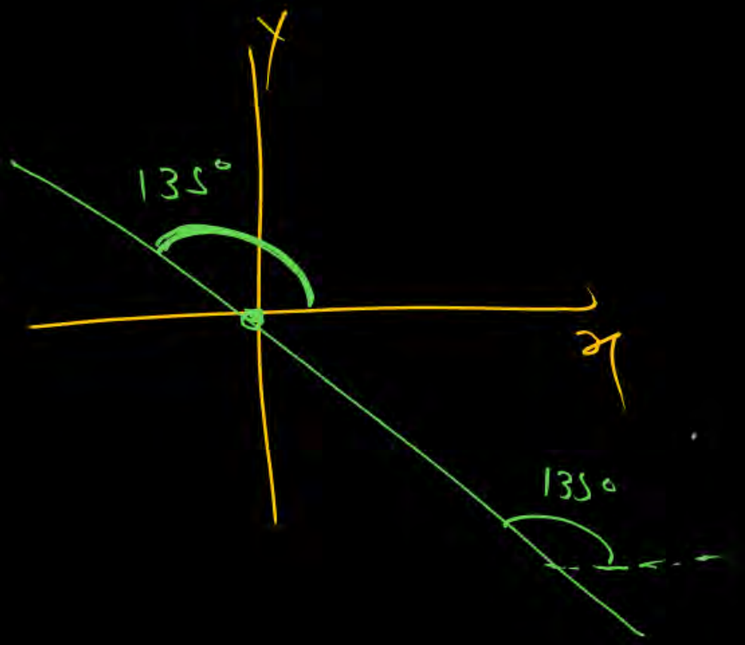
$y = mx + c$

$c = 0$

$m = -1$

$\tan\theta = -1$

$\theta = 135°$



(v) $y = 2x - 1$

Draw graph :-

Soln

Compare $y = \boxed{2}x - 1$

$y = \boxed{m}x + c$

$y = \boxed{C = -1}$ at $x = 0$

$\boxed{m = \tan\theta = 2}$

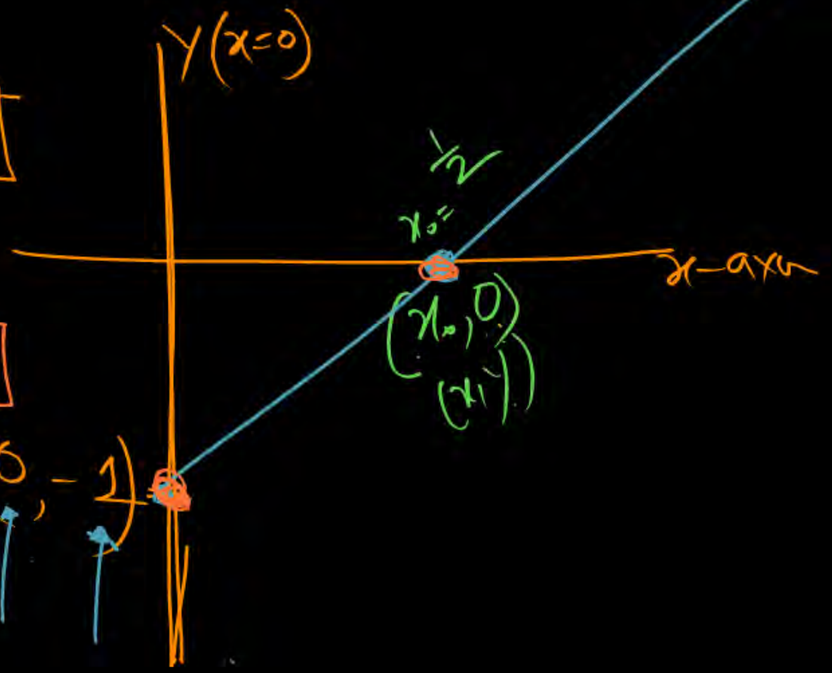
$\theta = \tan^{-1}(2)$

$y = 2x - 1$

$0 = 2x_0 - 1$

$1 = 2x_0$

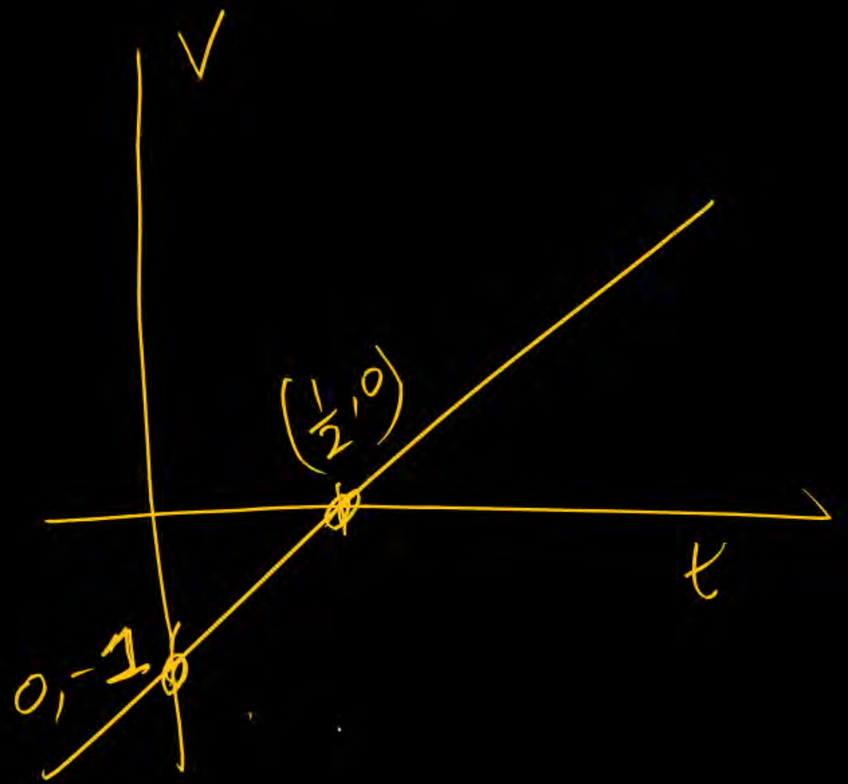
$x_0 = \frac{1}{2}$ ← x-Intercept



Ex

$V = 2t - 1$

Draw V/t graph



$$y = -2x + 4$$

(a) correct
(b) wrong

→ Draw graph B/w y & x.

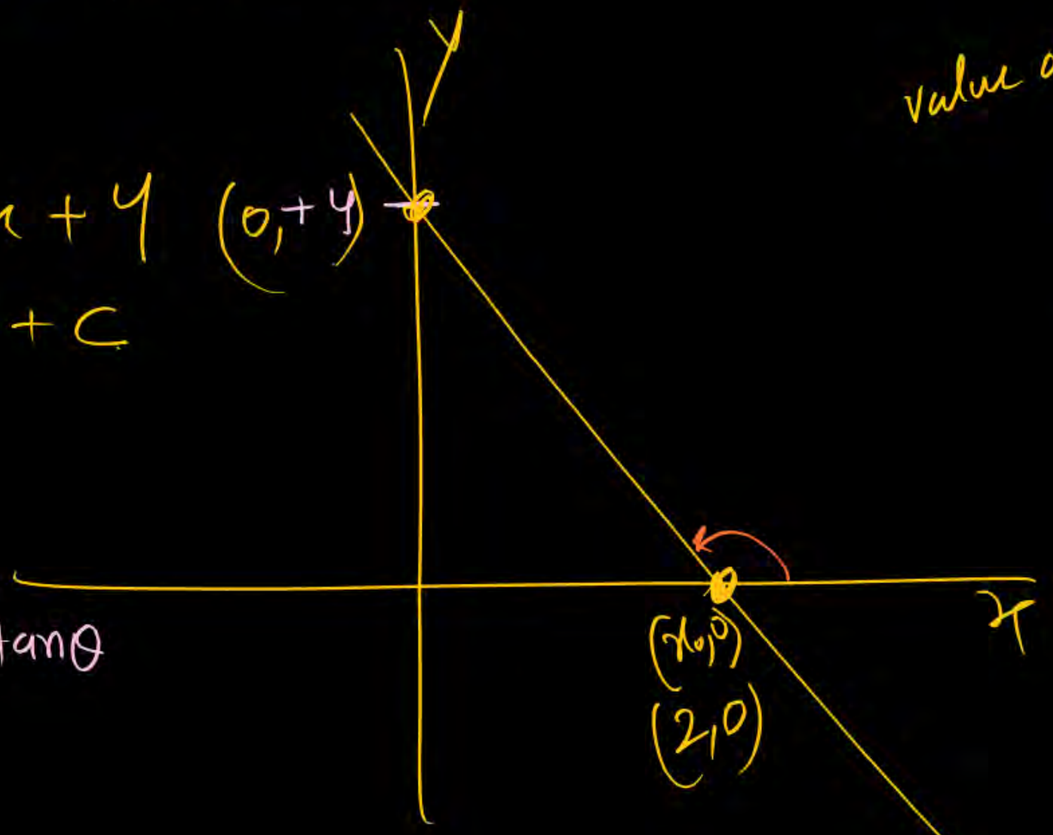
Soln

$$y = -2x + 4 \quad (0, +4)$$

$$y = mx + c$$

$$y_{(x=0)} = \boxed{c = 4}$$

$$\boxed{m = -2} = \tan\theta$$



value of x when $y = 0$

$$y = -2x + 4$$

$$0 = -2x + 4$$

$$2x = 4$$

$$x = \frac{4}{2} = +2$$

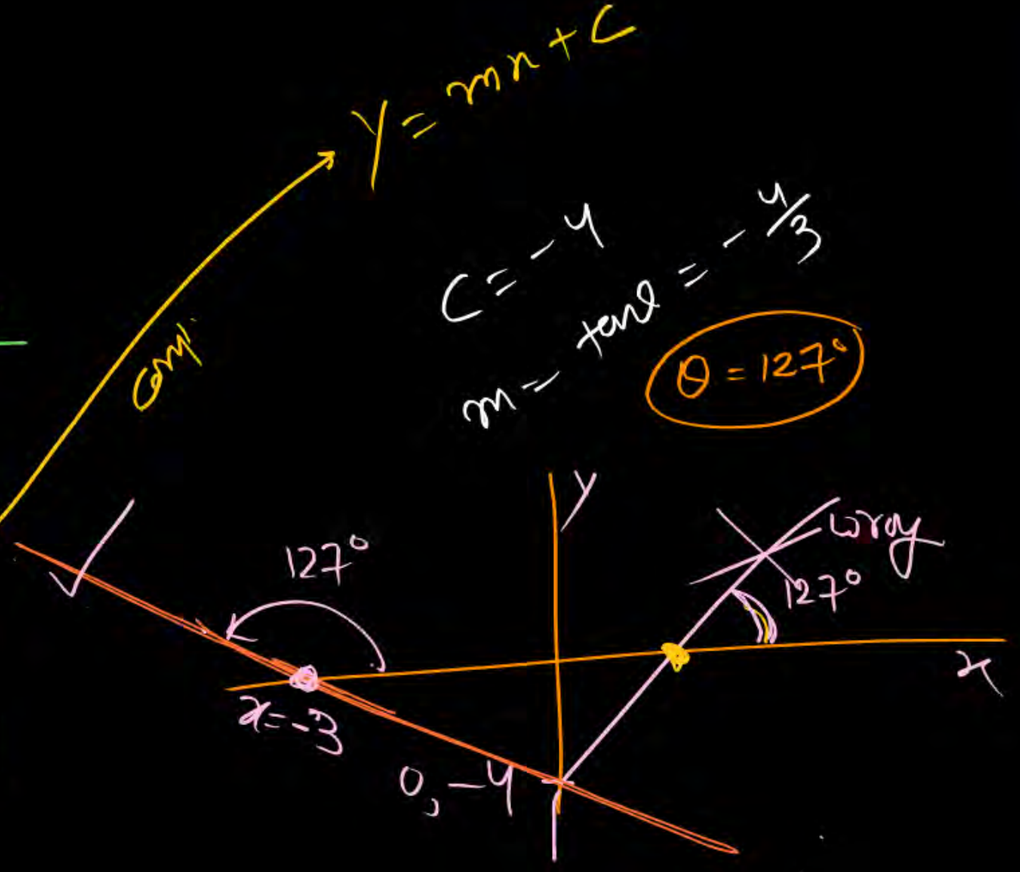
$\frac{x}{3}+\frac{y}{4}+1=0$

Draw graph B/w x & y

Soln $y=mx+c$

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

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



mp U

$\tan(127^\circ)=\tan(180-53)$

$=-\tan 53^\circ$

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

98.2%

Samjh aaya.

(#) $y=-\frac{4}{3}x-4$

If $y=0$ then find x

$0=-\frac{4}{3}x-4$

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

$-x=3$

$x=-3$

H/W

$(y-3) + (x-4) + 5 = 0$

Draw graph b/w x & y

H/W

$y = |x|$

Question

Draw graph having Y-intercept 4 and passing through (2, 6).

(x, y) → 1 Point ki information hai (x, y) $= (2, 6)$

$c = 4$

$\Rightarrow \quad y = mx + c$

$$\boxed{y = mx + 4}$$

Putting value ($x = 2$ then $y = 6$)

$6 = m \times 2 + 4$

$6 - 4 = 2m$

$2m = 2 \quad (m = 1)$

$m = \tan\theta = 1$

$\theta = 45°$

Question

H|W

Draw graph passing through (2, 3) and slope 1.

(x, y)

$(m = 1)$

Question

Find equation of a straight line passing through point (3, 4) and (2, 6).

(x_1, y_1) (x_2, y_2)

hint

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6-4}{2-3}$$

$$\# \quad \boxed{m = \frac{2}{-1} = -2}$$

$$y = mx + c$$

$$y = -2x + c$$

Put the value of $x = 3$ then $y = 4$

$$4 = -2 \times 3 + c$$

$$(c = +10)$$

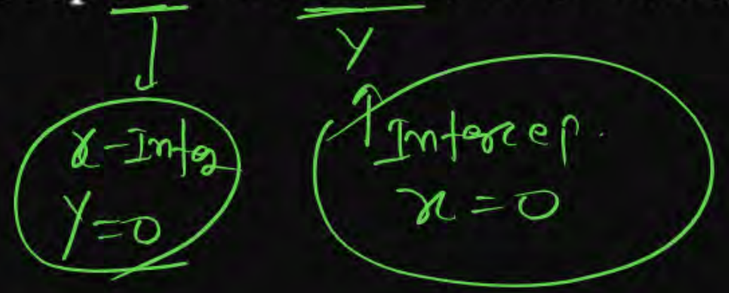
$$y = mx + c$$

$$\boxed{y = -2x + 10}$$

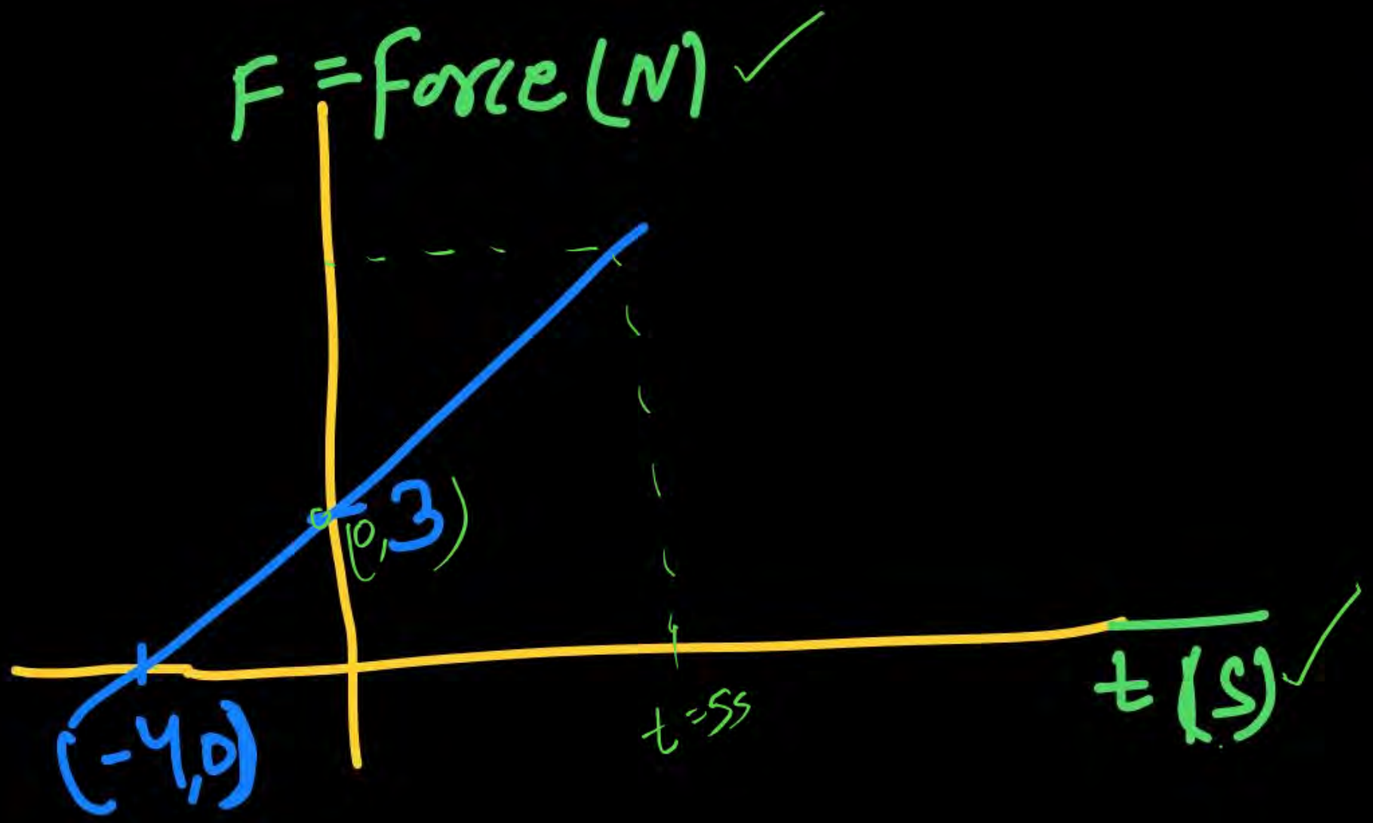
Question

H/W

Find equation of the line which makes intercept +4 and 5 on the x and y-axis.



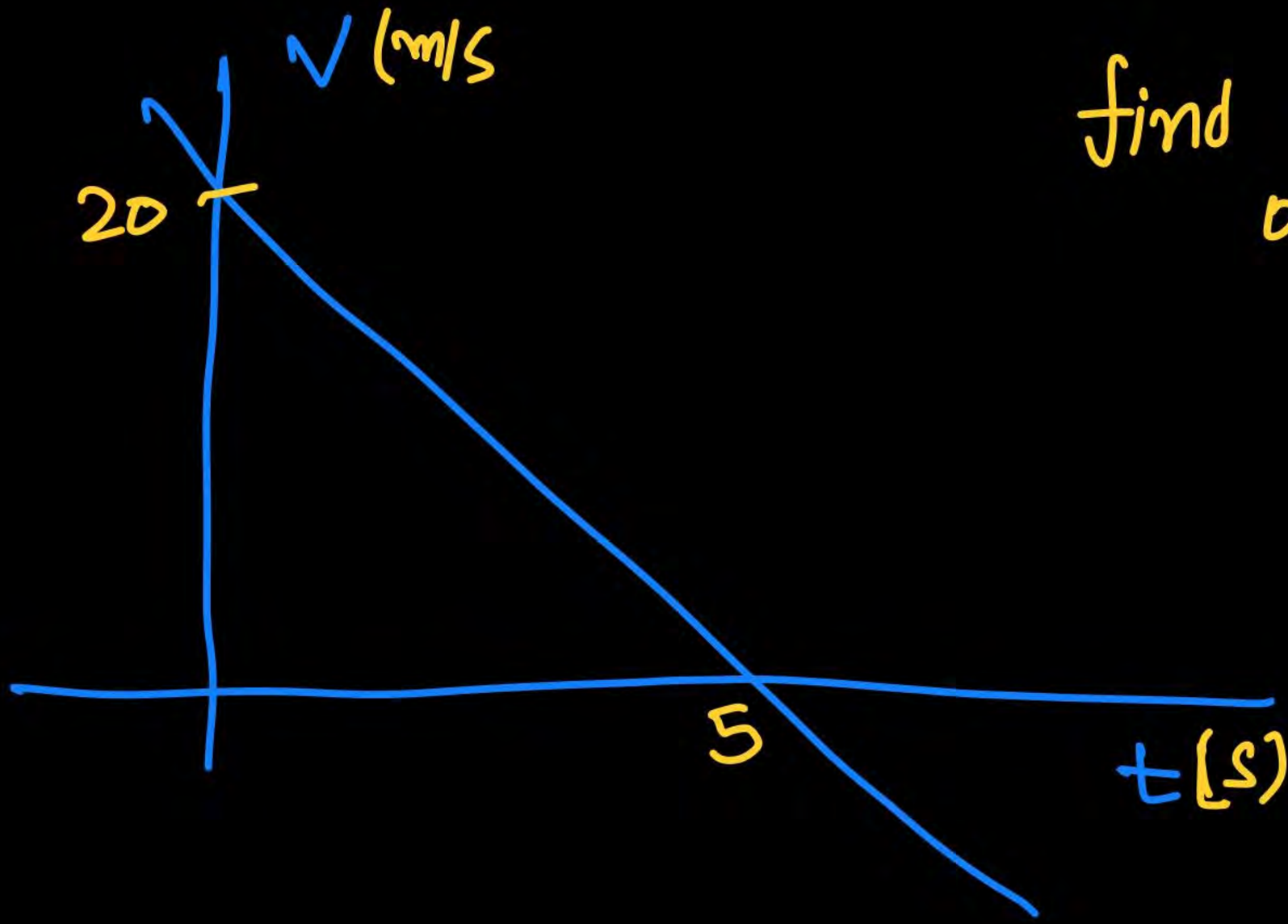
1. $5x + 4y + 20 = 0$
2. $4y + 5y - 20 = 0$
3. $4y - 5x = -20$
4. $4x + 5y + 20 = 0$



find value of force at t = 5 sec

$y = mx + c$

$F = mt + c$



find velocity of object at $t = 3s$, $t = 8s$

11/12

Draw graph for given equation.

$F = -Kx$

$PV = nRT$

(i) $(x-4)+(y+3)=5$

(ii) $4x+3y+4=0$

(iii) $y=|x|$

(iv) $y=|x-4|$

If $\frac{C-0}{100-0} = \frac{K-273}{373-273}$ then using this relation

Draw Graph b/w C & K.

THANK YOU