Nishant Jindal

1) St. line Sheet 2 Load kiihai

Basic Sheet hai

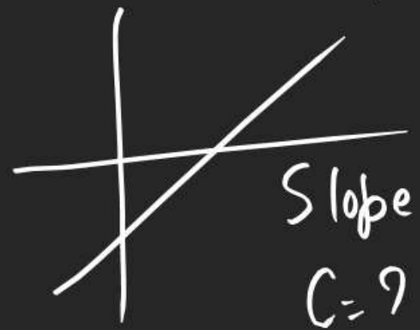
Ye Solve karni hai.

1 - 30 Qs.

2) Various forms of St. line.

1 - 9 Qs

Q $y = mx + c$ ... form ?



Slope Cut

$c = ?$ Yint

$c = -ve$ ho sakta hai.

Q (x_1, y_1) given & Slope given.

Which form I should use?

$(y - y_1) = m(x - x_1)$

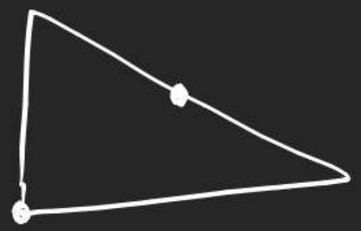
Point slope.

Q (x_1, y_1) (x_2, y_2)

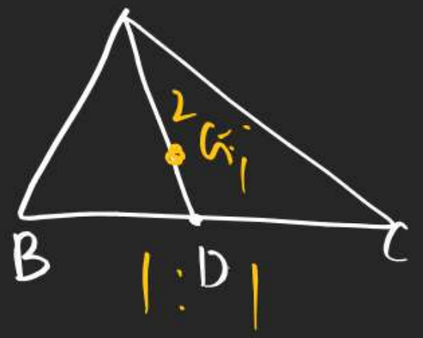
2 pt form.

$(y - y_1) = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$

Q



Circum Or Incenter



$I = \left\{ \frac{ax_1 + bx_2 + cx_3}{a + b + c} \right.$

$a, b, c = ?$

length of side dist. form

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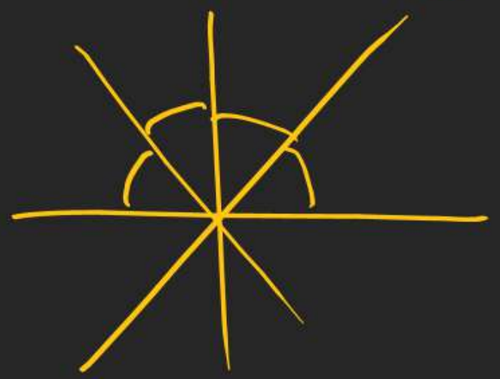
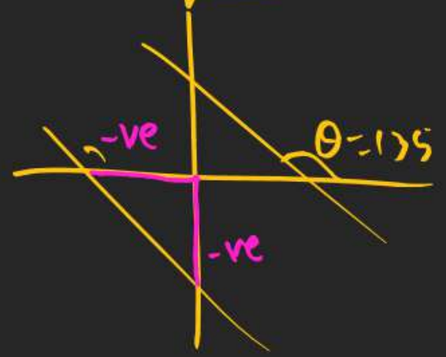
① Line equally Inclined to both axes



$\theta = 45°/135°$

$m = \pm 1$

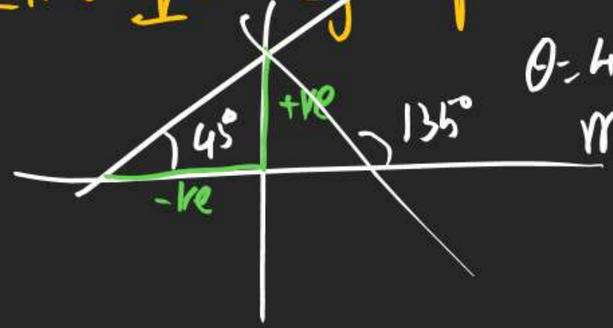
② Line equal Int.



$\theta = 135°$

$m = -1$

③ Line equal length of Int.



$\theta = 45°/135°$

$m = \pm 1$

① $ax+by+c=0 \rightarrow$ Gen Eq of Line.

Slope $= -\frac{a}{b}$

② $y-y_1 = m(x-x_1) \rightarrow$ 1 Pt & Slope

③ $y-y_1 = \frac{y_2-y_1}{x_2-x_1}(x-x_1) \rightarrow$ 2 Pts दिये हों

(4) $y = mx+c \rightarrow$ Slope + y int

Q If 2 Sides of Rectangle are

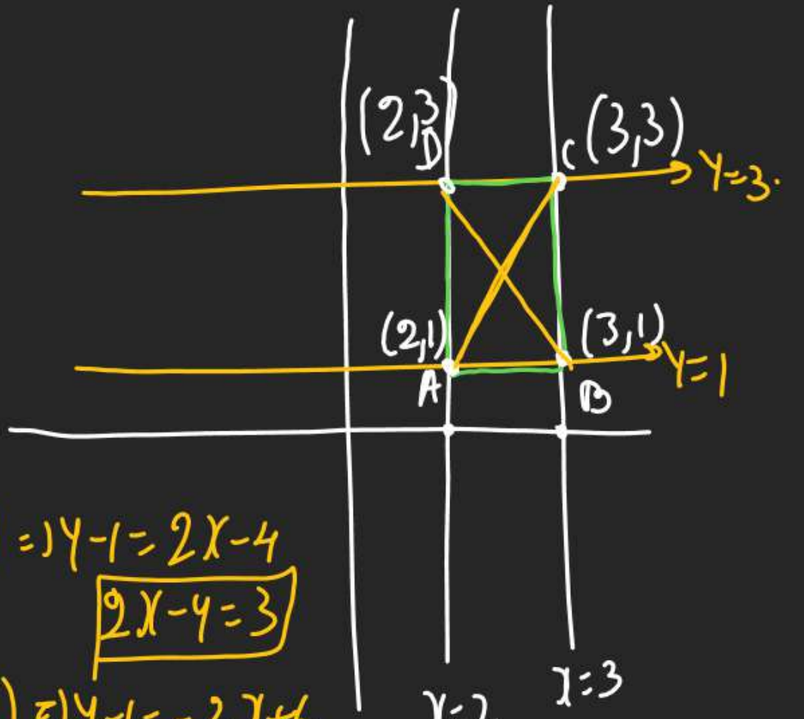
$x^2-5x+6=0$ & $y^2-4y+3=0$

find Eqn of Diagonal

$x^2-5x+6=0$ & $y^2-4y+3=0$

$(x-2)(x-3)=0$ & $(y-1)(y-3)=0$

$x=2$ & $x=3$ & $y=1, y=3$



$AC \rightarrow (y-1) = \frac{3-1}{3-2}(x-2) \Rightarrow y-1 = 2x-4$

$2x-y=3$

$BD \rightarrow (y-1) = \frac{3-1}{2-3}(x-3) \Rightarrow y-1 = -2x+6$

$2x+y=7$

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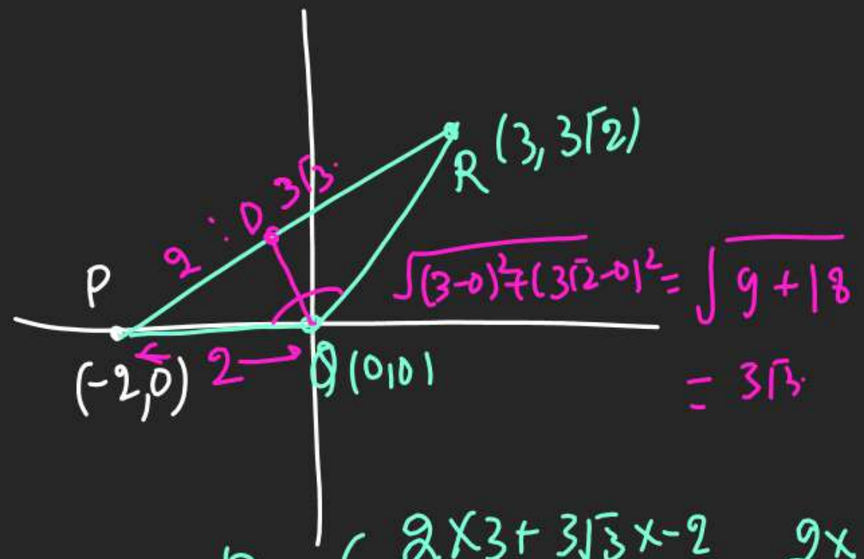
Q. If $P(-2,0)$, $Q(0,0)$, $R(3,3\sqrt{3})$ find Eq^n of Angle Bisesector of $\angle PQR$



$$D \equiv \left(\frac{2\times 3+3\sqrt{3}\times -2}{2+3\sqrt{3}}, \frac{2\times 3\sqrt{3}+0\times 3\sqrt{3}}{2+3\sqrt{3}}\right)$$

$$\equiv \left(\frac{6-6\sqrt{3}}{2+3\sqrt{3}}, \frac{6\sqrt{3}}{2+3\sqrt{3}}\right)$$

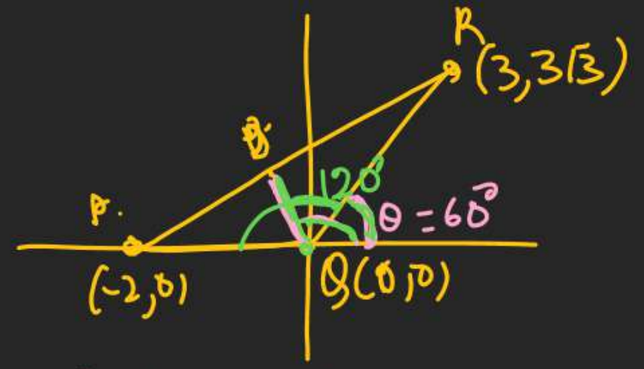
Eq^n of QD.

$$\Rightarrow (Y-0) = \frac{\frac{6\sqrt{3}}{2+3\sqrt{3}} - 0}{\frac{6-6\sqrt{3}}{2+3\sqrt{3}} - 0}(X-0)$$

$$\Rightarrow Y = \frac{6\sqrt{3}}{6(1-\sqrt{3})}(X)$$

$$\Rightarrow Y = \frac{\sqrt{3}}{1-\sqrt{3}}X$$

Q $P=(-2,0)$, $Q(0,0)$ $R=(3,3\sqrt{3})$ Angle Bisector of $\angle PQR$. Eq^n



(1) $\tan\theta = (Sl)_{QR} = \frac{3\sqrt{3}-0}{3-0} = \sqrt{3}$

$\theta = \frac{\pi}{3} = 60°$

(2) QD ⊥ to X Axis & Angle $120°$

$(Sl)_{QD} = \tan 120° = \tan(\pi - 60°)$

$= -\tan 60°$

$= -\sqrt{3}$

(3) Eq^n of QD $\Rightarrow (Y-0) = -\sqrt{3}(X-0)$

$\Rightarrow \boxed{Y = -\sqrt{3}X}$

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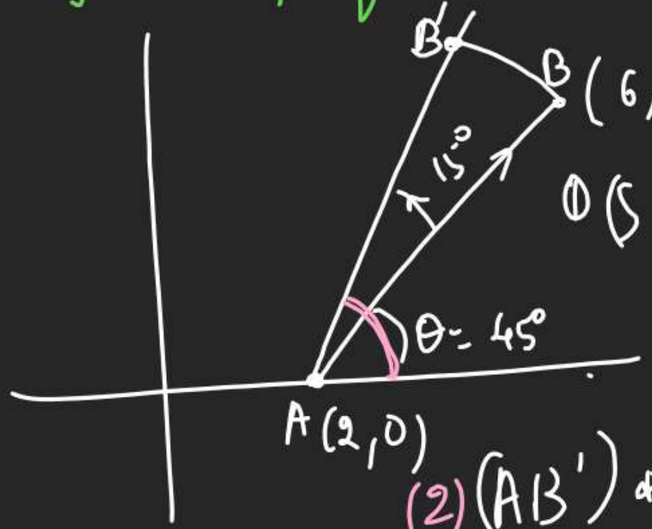
Q If A(2,0), B(6,4) & line AB is Rotated ACW about Pt A 15° find Eqn of NEW line.



(1) (Slope)$_{AB}$ = $\frac{4-0}{6-2}$ = 1

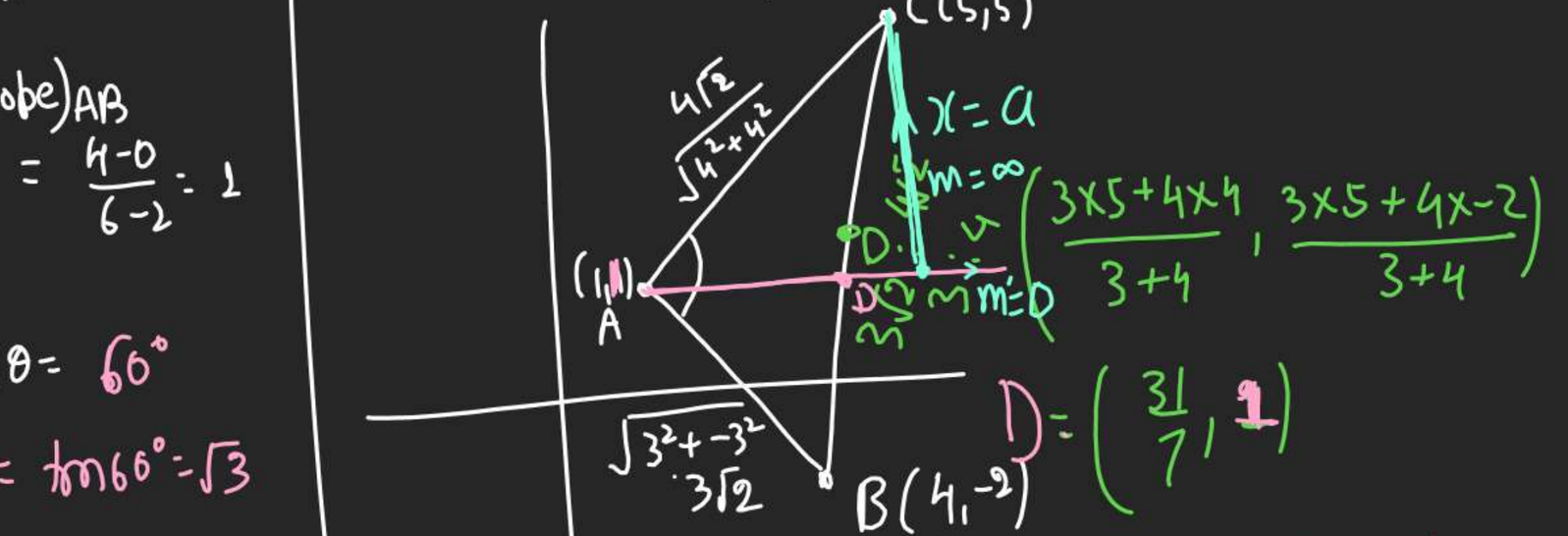
(2) $(AB')_{slope}$ = θ = 60°

(Sl)$_{AB'}$ = tan 60° = $\sqrt{3}$

(3) Eqn AB' =>

$(Y-0) = \sqrt{3}(X-2)$

Q Find Eq of Line ⊥r to Angle Bisector of A, P.T. "C" of A(1,1), B(4,-2), C(5,5)?



$(Y-5) = \frac{1}{0}(X-5)$

$X-5=0 \Rightarrow X=5$

Q is asking about a line P.T. (5,5) But ⊥r to AD this Line has to be ||r to y Axis ⇒ x=a type

⇒ Line's Eqn is $\boxed{X=5}$

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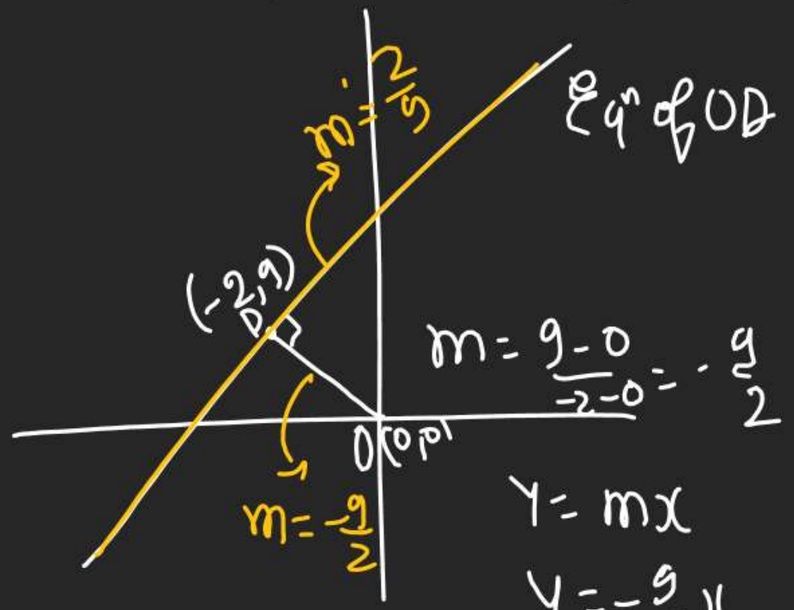
Q If ⊥r drawn from (0,0) to a line drops at (−2,9) find Eq^n of ⊥r line



$Y = mX$

$Y = -\frac{9}{2}X$

$2Y = -9X$

$9X + 2Y = 0$

Q (B) find Line ⊥r to OD ?

$(Y - 9) = \frac{2}{9}(X + 2)$

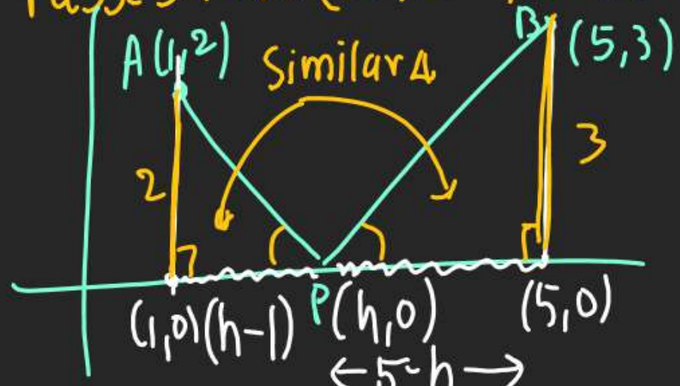
$9Y - 81 = 2X + 4$

$2X - 9Y + 85 = 0$

$\therefore P = (h, 0)$

$= (\frac{13}{5}, 0)$

Q$^{\circ}$ If Ray of Light Initiate from A(1,2) then after reflection on X Axis at P Pt Passes thro (5,3) find P?



$\frac{h-1}{5-h} = \frac{2}{3}$

$3h - 3 = 10 - 2h$

$5h = 13 \Rightarrow h = \frac{13}{5}$

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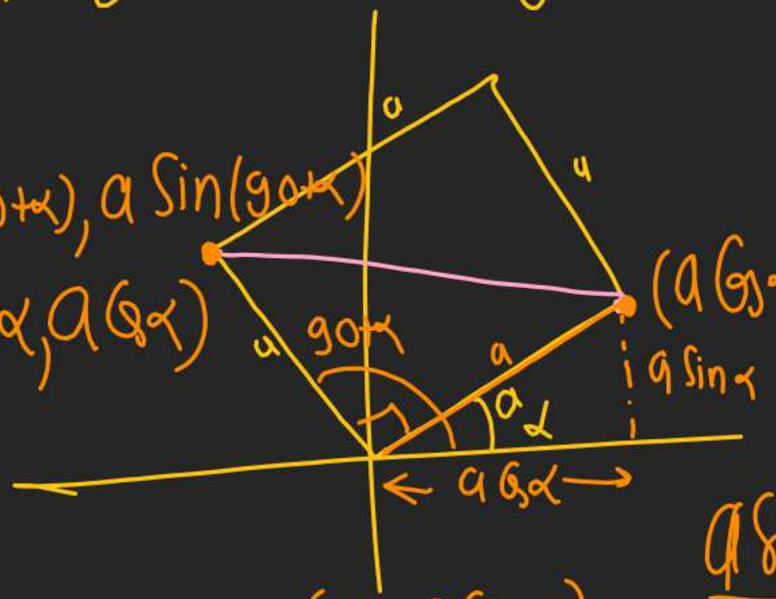
Q If Sides of Sq^r is a & one of its Vertex is at origin If one Side of Sq^r make angle α with x Axis find Eq^n of diagonal not Passing thru Origin.



$(a\cos(90+\alpha), a\sin(90+\alpha))$

$(-a\sin\alpha, a\cos\alpha)$

$(a\cos\alpha, a\sin\alpha)$

$(Y - a\sin\alpha) = \dfrac{a\sin\alpha - a\cos\alpha}{a\cos\alpha + a\sin\alpha}(X - a\cos\alpha)$

Solve

Q Find Ratio in which L^r from (4,1) divide line joining Pts (6,5) & (2,-1)

① If Ratio is Unknown take it $\frac{K}{1}$ Ratio $= \frac{K}{1} = \frac{8}{5}$ Ans

② Find D $\Rightarrow \left(\frac{2K+6}{K+1}, \frac{-K+5}{K+1}\right) = D$

③ $m_{BL} = \frac{5+1}{6-2} = \frac{6}{4} = \frac{3}{2} \Rightarrow m_{AD} = -\frac{2}{3}$

$(x - a\cos\alpha)(4)\left(\frac{\frac{-K+5}{K+1} - 1}{\frac{2K+6}{K+1} - 4}\right) = -\frac{2}{3} \Rightarrow \frac{-K+5-K-1}{2K+6-4K-4} = -\frac{2}{3}$

$\Rightarrow \frac{-2K+4}{-2K+2} = -\frac{2}{3} \Rightarrow K = \frac{8}{5}$

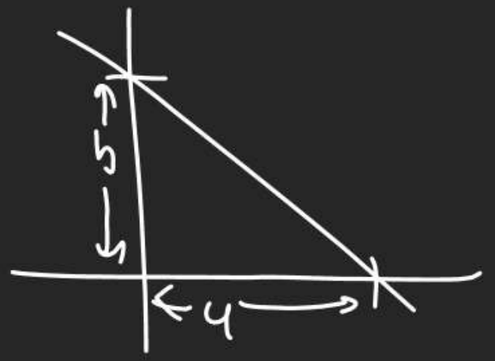
(6) Double Intercept form.

When x intercept & y int. is given.

x int = a

y int = b

then Line $\Rightarrow \frac{x}{a} + \frac{y}{b} = 1$



Q $2x + y = 6$. find x int & y int?

(1) $\frac{2x}{6} + \frac{y}{6} = 1$ ÷6

$\frac{x}{3} + \frac{y}{6} = 1$

x int = 3

y int = 6

(2) x int Pucho Put y = 0

$2x + 0 = 6 \Rightarrow x = 3$.

y int Pucho Put x = 0

$0 + y = 6 \Rightarrow y = 6$.

* a, b +ve, -ve anything Possible

Q $x + 3y + 18 = 0$ find x int, y int & make diag.

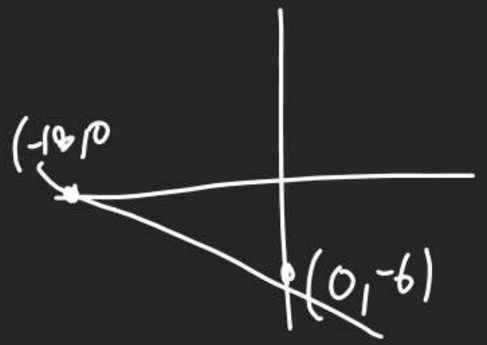
$x + 3y = -18$

$\frac{x}{-18} + \frac{3y}{-18} = 1$

$\frac{x}{-18} + \frac{y}{-6} = 1$

x int = -18

y int = -6



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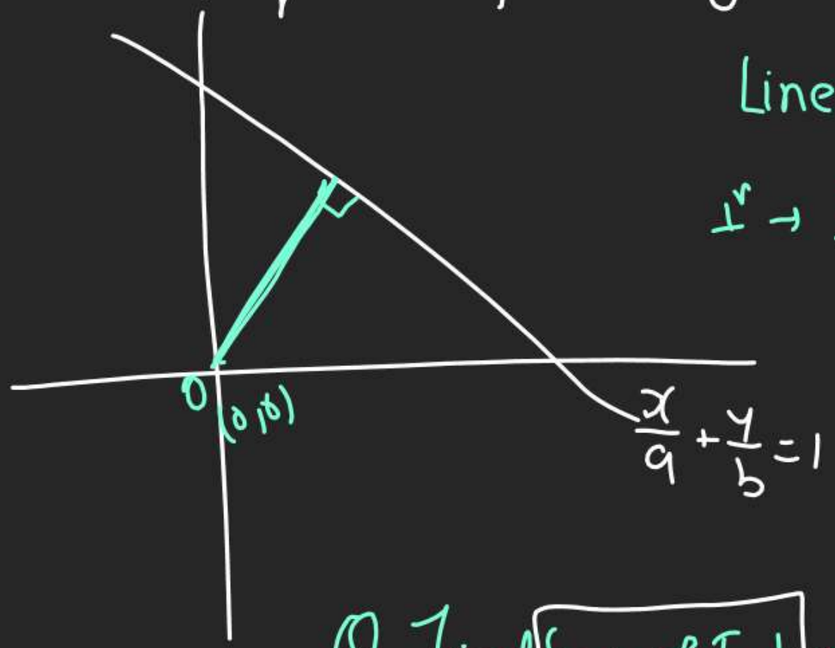
Q If Line is $\frac{x}{a}+\frac{y}{b}=1$ find.

Eqn of line $\perp^r$ from Origin.



Line $\frac{x}{a}+\frac{y}{b}=1$

$\perp^r \rightarrow \frac{x}{b}-\frac{y}{a}=K$

P.T. (0,0)

$\frac{0}{b}-\frac{0}{a}=K \Rightarrow K=0$

$\therefore$ Line $\rightarrow \frac{x}{b}-\frac{y}{a}=0$

Q Find Sum of Int. made by line $2x-3y=5$

Intercept form

$2x-3y=5$

$\frac{2x}{5}-\frac{3y}{5}=1 \Rightarrow \frac{x}{(5/2)}+\frac{y}{(-5/3)}=1$

$x_{int}=5/2$, $y_{int}=-5/3$

$Sum=\frac{5}{2}-\frac{5}{3}=5\left(\frac{1}{2}-\frac{1}{3}\right)$

$=\frac{5}{6}$.