Nishant Jindal

Q P, Q, R 3 pts divides Line.
Joining $A(3,4)$, $B(3,-2)$
Such that $AP = PQ = QR = RB$.
find P, Q, R.

4 Section. की बात कर रहा है

diff in $x = \frac{0}{4} = 0$

diff in $y = \frac{-6}{4} = \frac{-3}{2}$

$A(3,4)$ —— $P\left(3,\frac{5}{2}\right)$ —— $Q(3,1)$ —— $R\left(3,-\frac{1}{2}\right)$ —— $B(3,-2)$

Q 8–16 HW

Q Find Coord. of Pt. Which divides Internally & Externally the line joining $(1,-3)$ & $(-3,9)$ in Ratio $1:3$?

Int.

$A(1,-3)$ —1 : 3— $P(h,K)$ —— $B(-3,9)$

$$\frac{AP}{PB} = \frac{1}{3}$$

$$h = \frac{1\times -3 + 3\times 1}{1+3} = 0$$

$$K = \frac{1\times 9 + 3\times -3}{1+3} = \frac{0}{4} = 0$$

$(0,0)$

Ext.

$A(1,-3)$ —— $B(-3,9)$ —3— $P(h,K)$

$$\frac{AP}{PB} = \frac{1}{3}$$

$A(1,-3)$ —1— $P(h,K)$ —-3— $B(-3,9)$

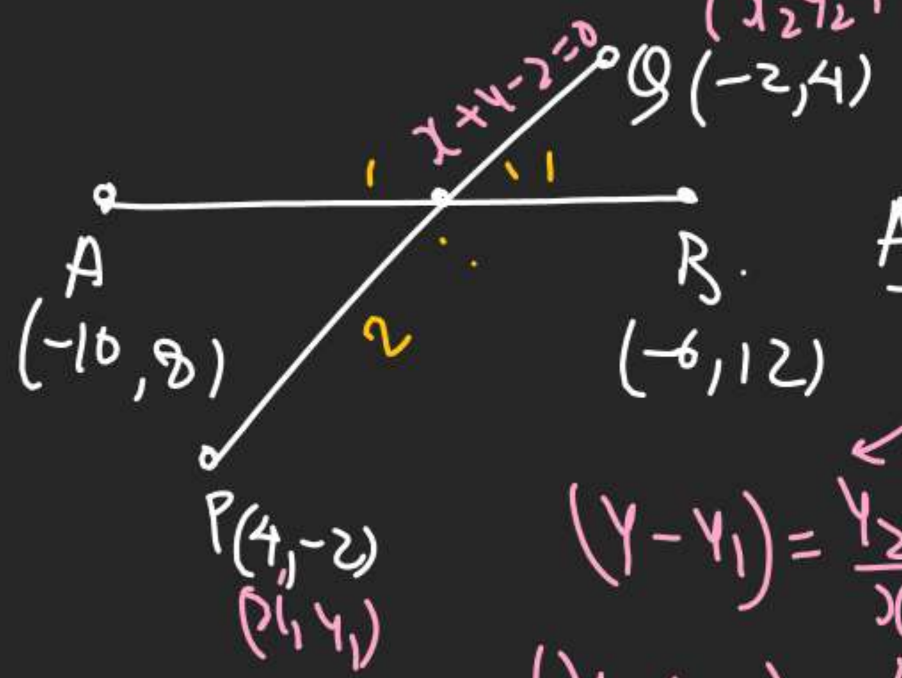
$$h = \frac{1\times -3 + -3\times 1}{1+-3} = \frac{-6}{-2} = 3$$

$$K = \frac{1\times 9 + -3\times -3}{1+-3} = \frac{18}{-2} = -9$$

$\therefore (h,K) = (3,-9)$

Q Ratio in which line seg. joining $(-10,8)$ & $(-6,12)$ divides the line. Segment Joining $(4,-2)$ & $(-2,4)$ is?

① Ratio Unknown → take Ratio = K:1



Advance

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

$$(y-(-2)) = \frac{4-(-2)}{-2-4}(x-4)$$

$$y+2 = \frac{\cancel{6}^{-1}}{\cancel{-6}}(x-4)$$

$$y+2 = -x+4 \Rightarrow \boxed{x+y=2}$$

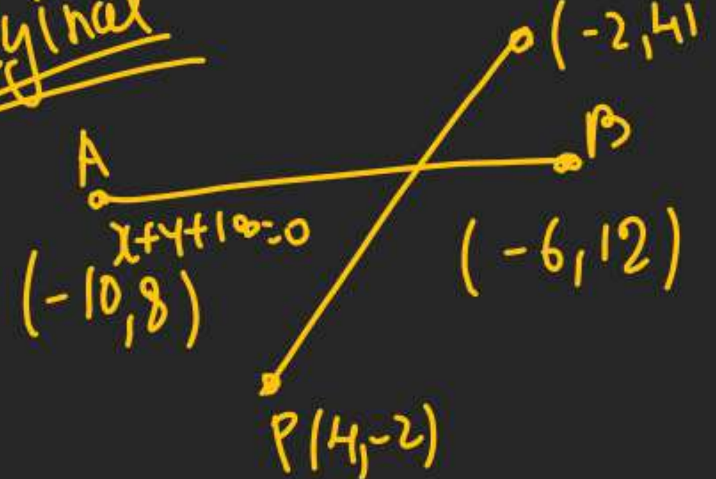
Line → $x+y-2$

Use.

$$\text{Ratio} = -\frac{(-10+8-2)}{(-6+12-2)} = -\left(\frac{(lx_1+my_1+n)}{(lx_2+my_2+n)}\right)$$

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

Original



$$\rightarrow (y-8) = \frac{12-8}{-6+10}(x+10)$$

$$y-8 = \frac{4}{4}(x+10) \Rightarrow x-y+18=0$$

$$\text{Ratio} = -\frac{(4+2+18)}{(-2-4+18)} = -\frac{24}{12} = -\frac{2}{1}$$

2:1 External

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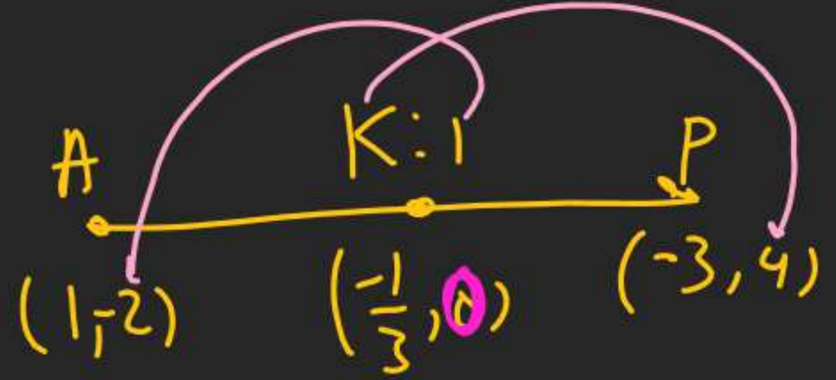
Q11 $\left(-\frac{1}{3}, 0\right)$ divides $(1,-2)$ & $(-3,4)$ in Ratio?



$$0 = \frac{K \times 4 + 1 \times -2}{K+1}$$

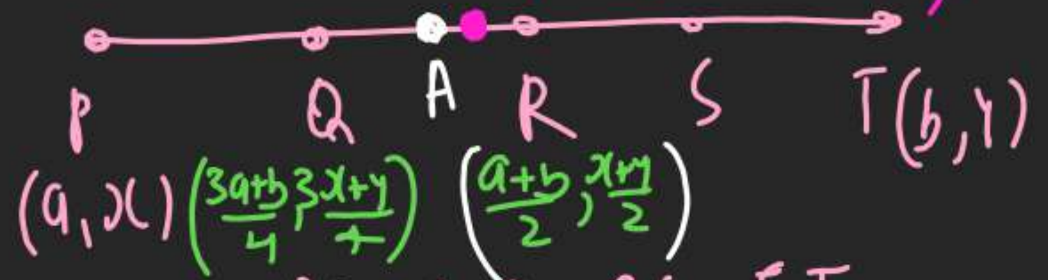
$$0 = 4K - 2$$

$$4K = 2$$

$$K = \frac{1}{2} \therefore \text{Ratio} = \frac{K}{1} = \frac{1}{2}$$

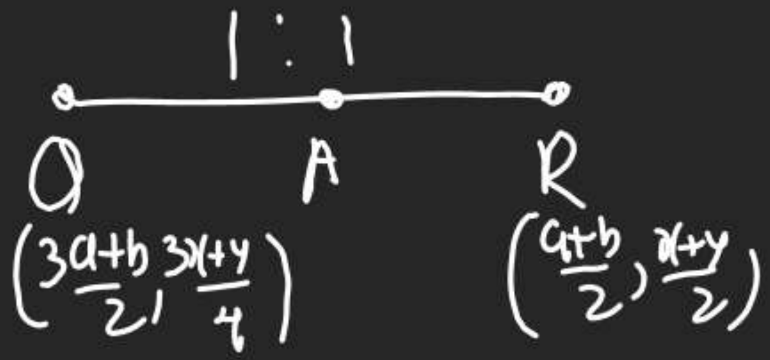
Q13

$$A\left(\frac{5a+3b}{8}, \frac{5x+3y}{8}\right)$$



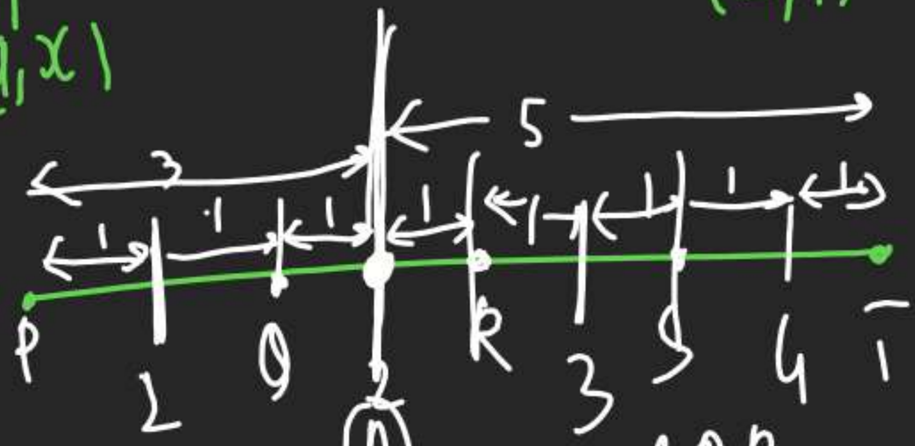
PQ = QR = RS = ST

$$\frac{a + \frac{a+b}{2}}{2} = \frac{3a+b}{4}$$



$$A = \left(\frac{5a+3b}{5+3}, \frac{5x+3y}{5+3}\right)$$

3 : 5 = 8 Portion.



A is MP of QR.

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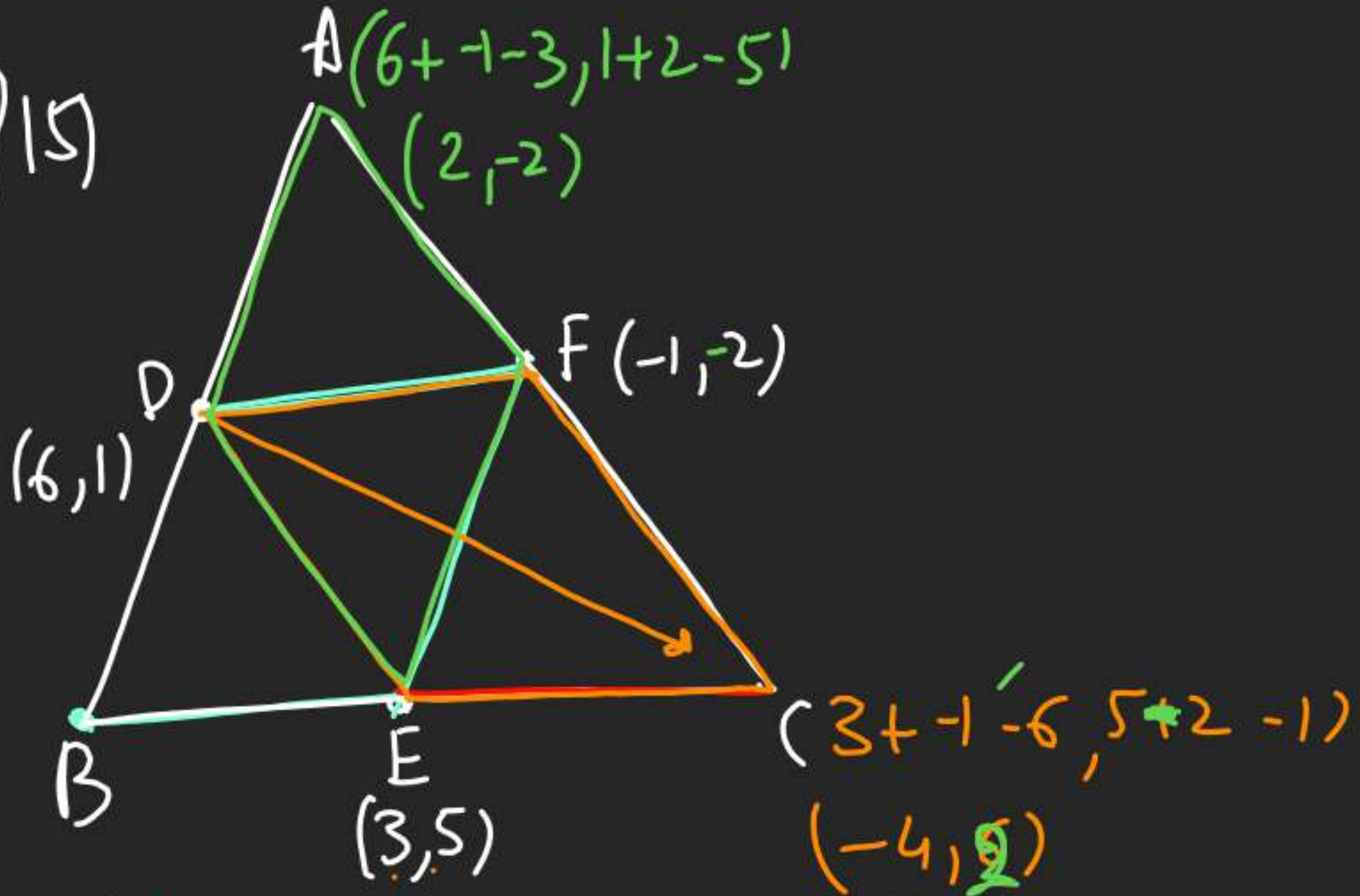
Q15)



(6+3-(-1), 1+5-2)

(10, 4)

3 Lect

① Find Ratio in which line seg. Joining (2, -3) & (5, 6) is divided by x Axis

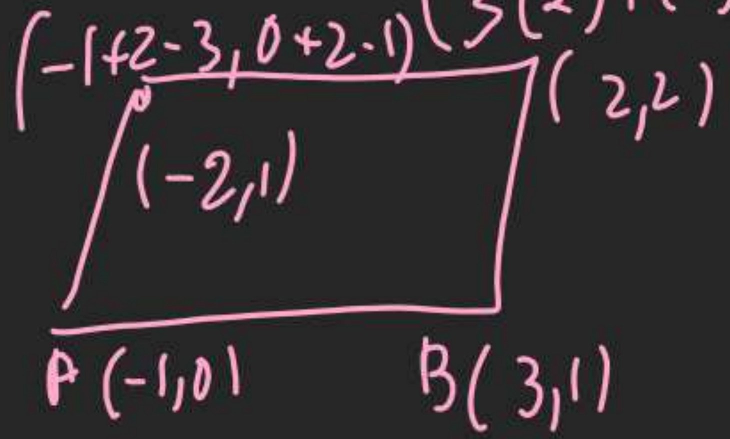
Q ——— ——— (1, 3) & (2, 7) is divided by 3x+y=9.

Q ABCD is a llgm. Where A, B, C are (-1, 0), (3, 1), (2, 2) find D.

① Ratio = $-\frac{y_1}{y_2} = -\frac{(-3)}{6} = \frac{1}{2}$

(2) Ratio = $-\frac{(3\cdot(1)+3-9)}{(3(2)+(7)-9)} = \frac{-(-3)}{4} = \frac{3}{4}$

(3)



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Centres of Δ

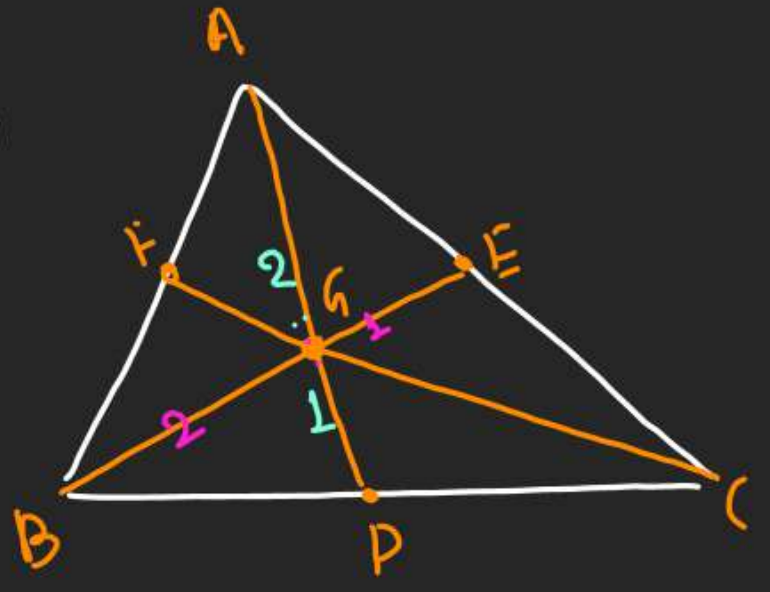
① Centroid

(A) It is Rep by G.

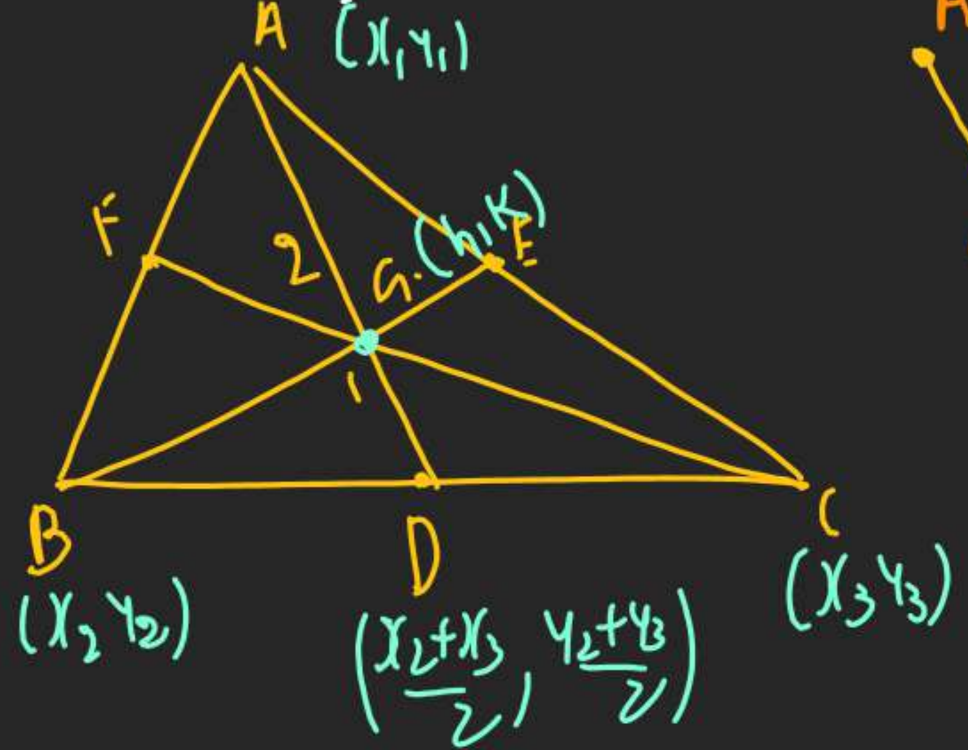
(B) It is PoI of Medians.

(C) Median is a Line segment which joins Vertex to its opp. Side's MP.

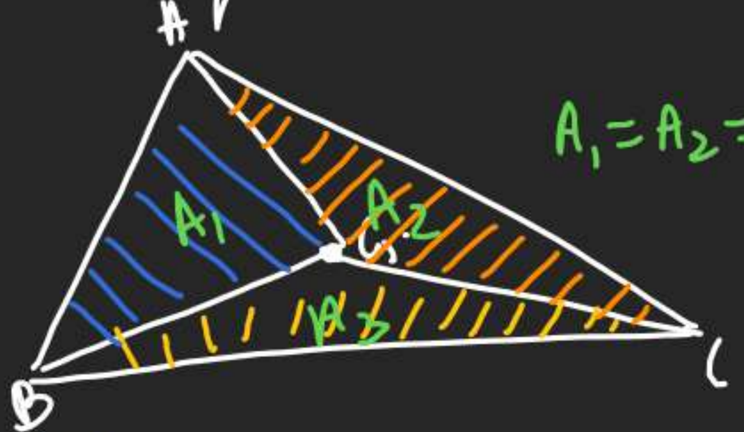
(D)



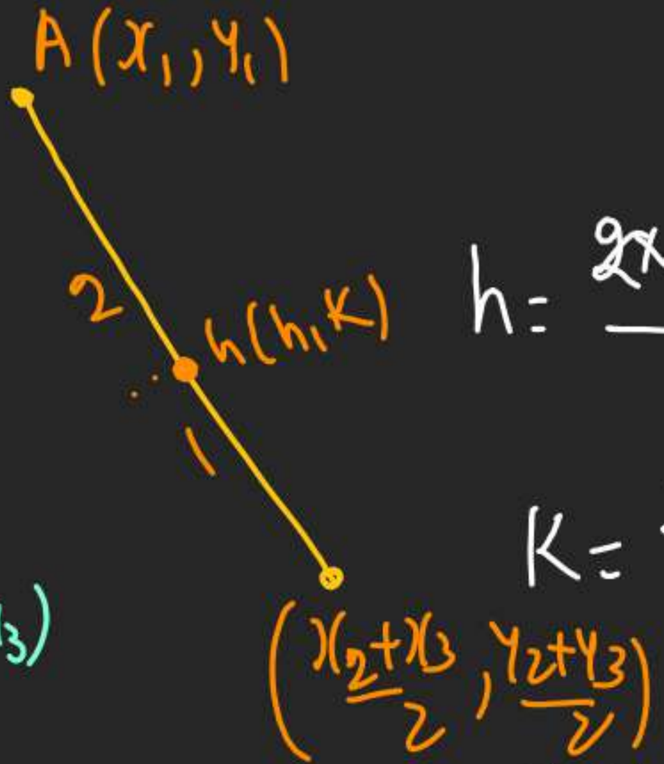
(E) Centroid divides Median in 2:1 from Vertex's side.



(F) Centroid (G) divides Δ ABC's Area in 3 equal Parts.



$A_1 = A_2 = A_3 = \frac{\Delta}{3}$



$$h = \frac{2 \times \left(\frac{x_2+x_3}{2}\right) + 1 \times x_1}{2+1}$$

$$k = \frac{2 \times \left(\frac{y_2+y_3}{2}\right) + 1 \times y_1}{2+1}$$

$$(h, k) \equiv \left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$$

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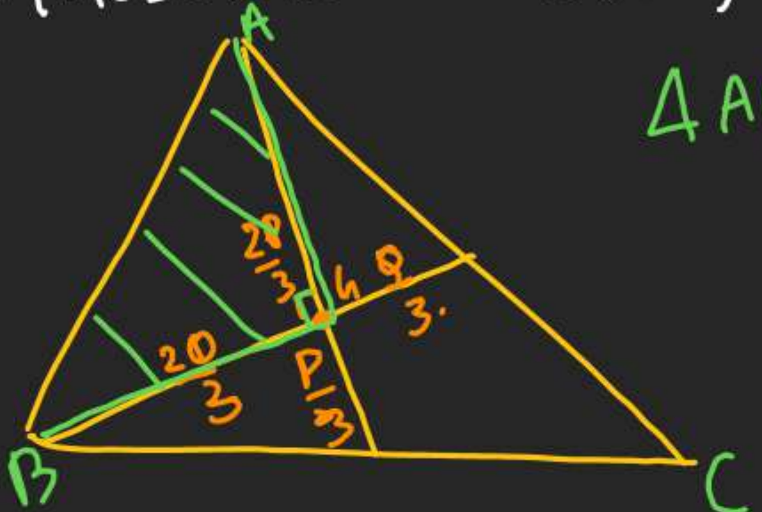
Q Find Centroid of Δ made by angular Pts $(-1,0), (5,-2), (8,2)$

$$G = \left(\frac{-1+5+8}{3}, \frac{0+-2+2}{3}\right) = (4,0)$$

Q If vertices of Δ are $(1,a)$ $(2,b)$ $(c^2,-3)$ P.T. Centroid cannot lie on y Axis (HW)

Q. Find area of Δ whose medians are ⊥ to each other & length of these 2 medians is P, Q Resp.?



$\Delta ABC = 3\ \Delta$'s ABC

$$= 3 \times \frac{1}{2} \times \frac{2Q}{3} \times \frac{2P}{3}$$

$$\Delta = \frac{2PQ}{3} \checkmark$$

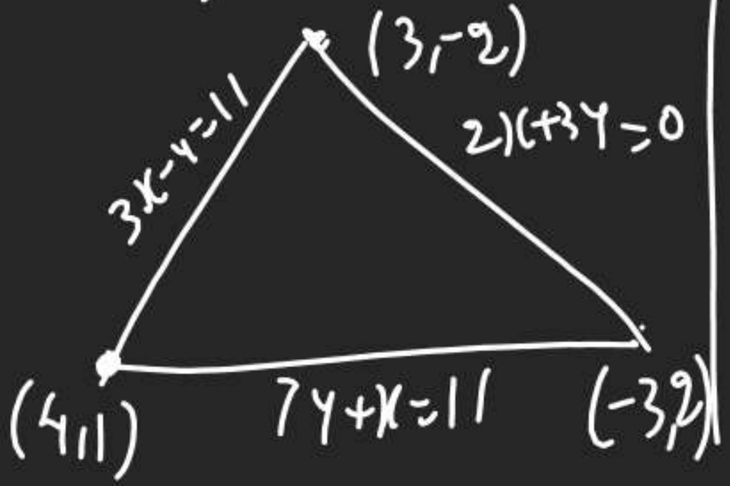
Q. Find Centroid of Δ made by Lines

$3x-y-11=0,\ 7y+x-11=0,\ 2x+3y=0$

$$3x - y = 11 \quad \times 7$$
$$x + 7y = 11$$

$$21x - 7y = 77$$
$$x + 7y = 11$$

$$22x = 88 \Rightarrow x = 4,\ y = 1$$
$(4,1)$



$$9x - 3y = 33$$
$$2x + 3y = 0$$

$$11x = 33$$
$x = 3,\ y = -2$

$$2x + 14y = 22$$
$$2x + 3y = 0$$

$$11y = 22$$
$x = -3,\ y = 2$

$$\therefore G = \left(\frac{4+3-3}{3}, \frac{1-2+2}{3}\right)$$

$$\left(\frac{4}{3}, \frac{1}{3}\right)$$

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(2) Incentre

A) It is Rep by I

$$\frac{\frac{ac}{b+c}}{\frac{c}{1}} = \frac{a\cancel{c}}{b+c}\times\frac{1}{\cancel{c}} = a : b+c$$

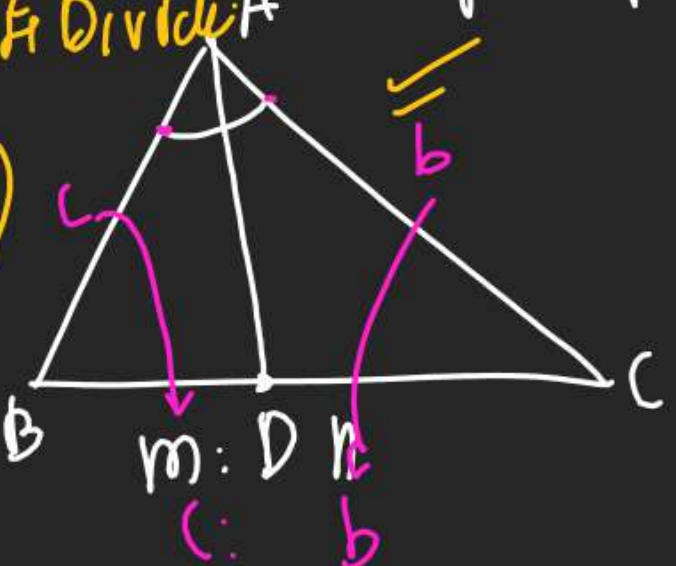
(B) Incentre is PoI of Angle Bisectors.

(C) Angle Bisector Theorem.

Angle Bisector always divides Line infront of its Vertex in the Ratio of length of Corresponding Sides.

10 Kg Alu 3 : 2 में Divide

$$\left(\frac{3\times 10}{3+2}, \frac{2\times 10}{3+2}\right)$$



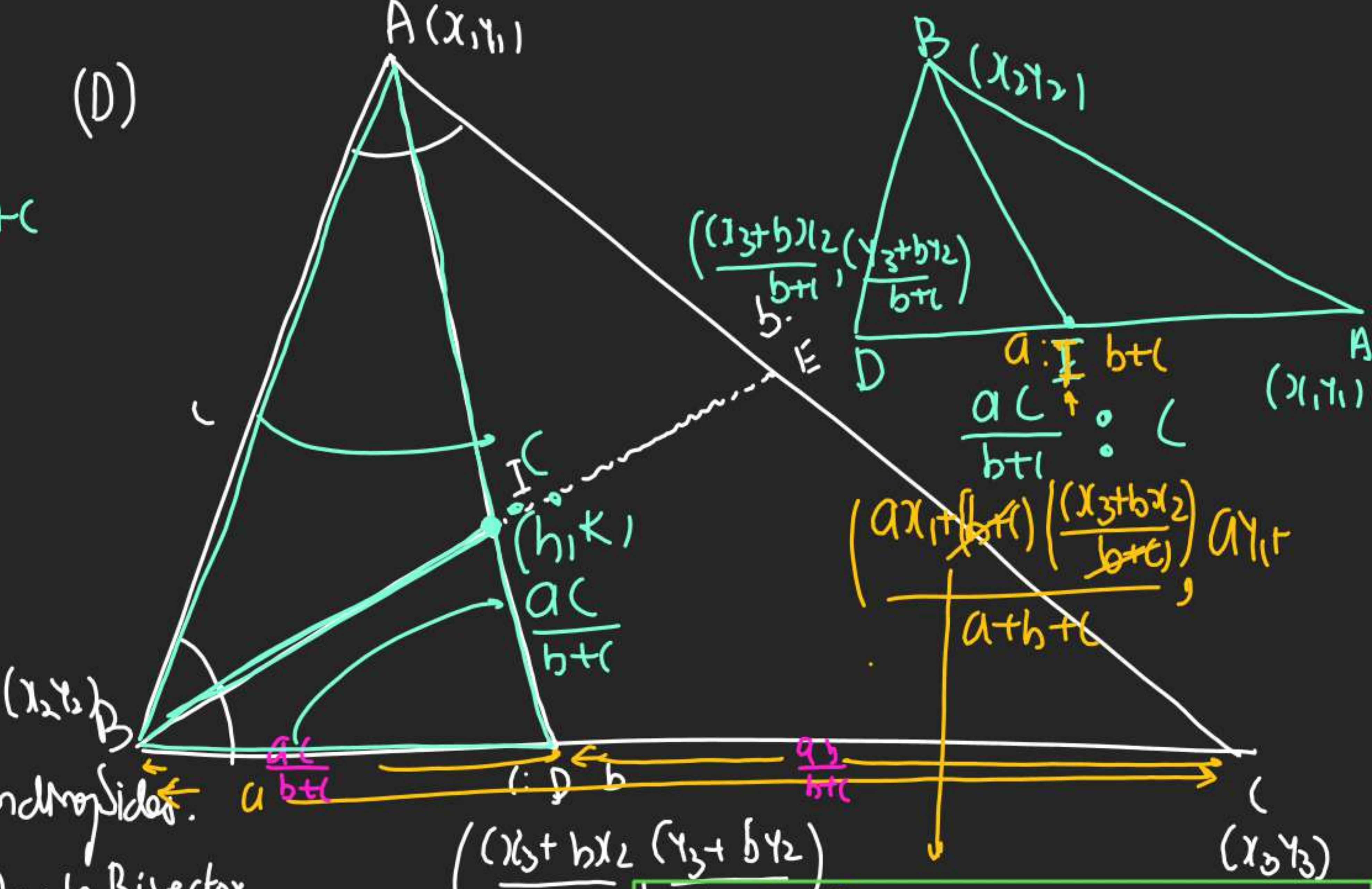
AD = Angle Bisector

AD divides BC in Ratio $= \frac{m}{n} = \frac{c}{b}$

D ने BC (a) को c : b Ratio में बाँटा!

$$\left(\frac{c\times a}{b+c}, \frac{b\times a}{b+c}\right)$$

(D)



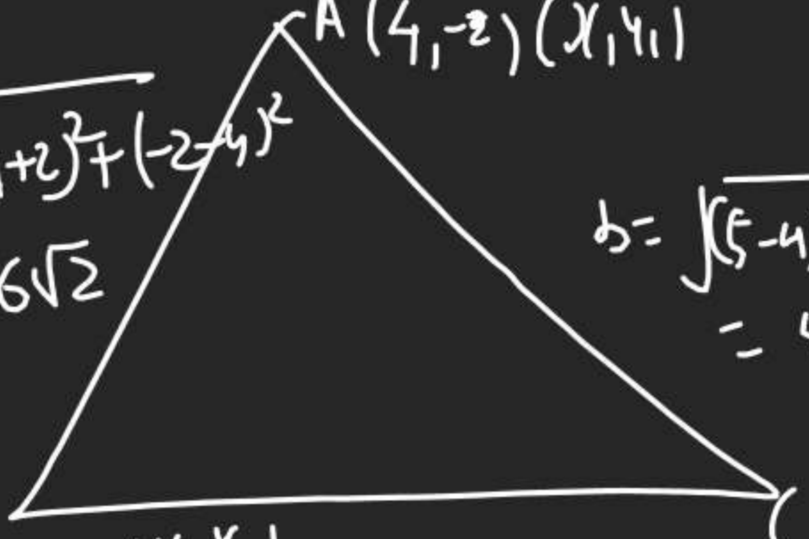
$$\left(\frac{cx_3+bx_2}{b+c}, \frac{cy_3+by_2}{b+c}\right)$$

$$\left(\frac{ax_1+\cancel{(b+c)}\left(\frac{cx_3+bx_2}{\cancel{b+c}}\right)}{a+b+c}, \frac{ay_1+\dots}{}\right)$$

$$\boxed{D)\ I = \left(\frac{ax_1+bx_2+cx_3}{a+b+c}, \frac{ay_1+by_2+cy_3}{a+b+c}\right)}$$

Q Find Incentre of Δ. Whose vertices are.

$(4,-2), (-2,4)$ & $(5,5)$



$c = \sqrt{(4+2)^2+(-2-4)^2}$

$= 6\sqrt{2}$

$b = \sqrt{(5-4)^2+(5+2)^2}$

$= 5\sqrt{2}$

$a = \sqrt{(-2-5)^2+(4-5)^2}$

$= \sqrt{49+1} = 5\sqrt{2}$

$$I = \left(\frac{4\times 5\sqrt{2} + -2\times 5\sqrt{2} + 5\times 6\sqrt{2}}{5\sqrt{2}+5\sqrt{2}+6\sqrt{2}}, \frac{5\sqrt{2}\times -2 + 4\times 5\sqrt{2} + 5\times 6\sqrt{2}}{5\sqrt{2}+5\sqrt{2}+6\sqrt{2}} \right)$$

$$= \left(\frac{40\cancel{\sqrt{2}}}{16\cancel{\sqrt{2}}}, \frac{40\cancel{\sqrt{2}}}{16\cancel{\sqrt{2}}} \right) = \left(\frac{5}{2}, \frac{5}{2} \right)$$

HW

17, 19, 20, 21, 22, 23, 24, 25

40, 41, 42, 43, 45, 47, 50, 52, 55