Nishant Jindal

POINT

Find the distances between the following pairs of points

Q.1 $(2, 3)$ **and** $(5, 7)$

Q.2 $(4, -7)$ **and** $(-1, 5)$

Q1 $AB = \sqrt{(a-b)^2 + (b-a)^2}$

$BC = \sqrt{(b-c)^2 + (a-c)^2}$

$CA = \sqrt{(c-a)^2 + (c-b)^2}$

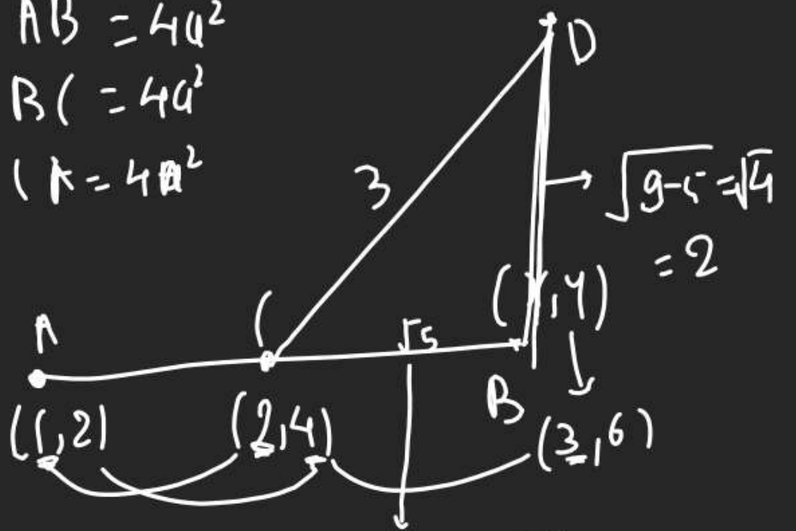
Isosceles.

2
3
4
5
6
7
8

Q5 $AB = 4a^2$

$BC = 4a^2$

$CA = 4a^2$



Q7

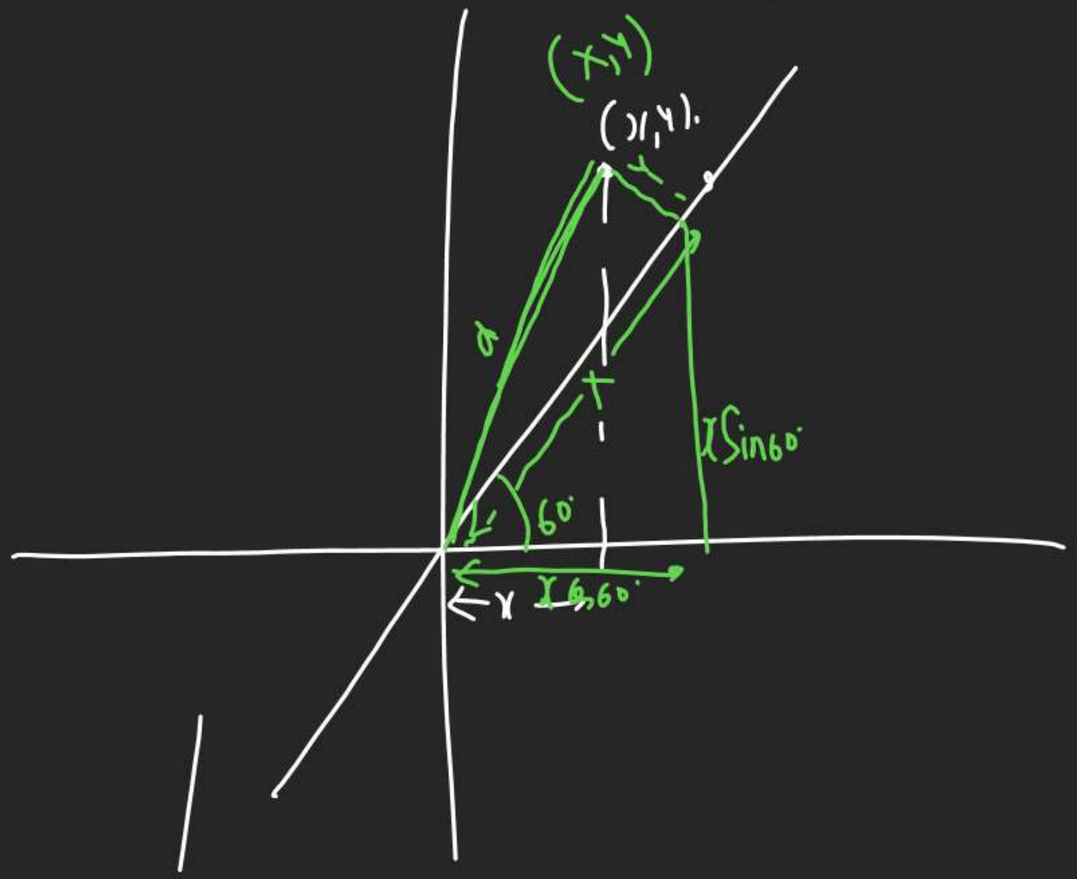
$\sqrt{(3-2)^2 + (6-4)^2}$

$\sqrt{1+4} = \sqrt{5}$

POINT

Rotation of Axes

Q.3 Find the distances between the following pairs of points $(-3, -2)$ and $(-6, 7)$, the axes being inclined at $60°$.



Nishant Jindal

POINT

Find the distances between the following pairs of points

Q.7 $(am_1^2, 2am_1)$ **and** $(am_2^2, 2am_2)$.

$$d = \sqrt{(a(m_1^2 - m_2^2))^2 + (2a(m_1 - m_2))^2}$$

$$= a(m_1 - m_2)\sqrt{(m_1 + m_2)^2 + 4}.$$

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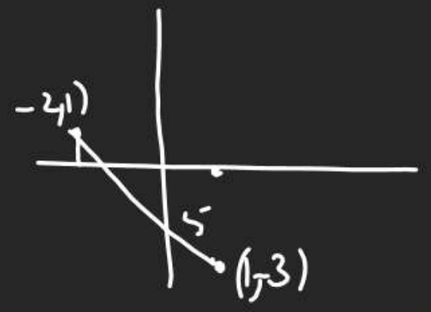
POINT

Q.8 Lay down in a figure the positions of the points $(1, -3)$ and $(-2, 1)$, and prove that the distance between them is 5 .



POINT

Q.9 Find the value of x_1 if the distance between the points $(x_1, 2)$ and $(3, 4)$ be 8 .

$$\sqrt{(x_1-3)^2+(2-4)^2} = 8$$

$$(x_1-3)^2+4 = 64$$

$$(x_1-3)^2 = 60$$

$$(x_1-3)^2-(2\sqrt{15})^2=0$$

$$(x_1-3-2\sqrt{15})(x_1-3+2\sqrt{15})=0$$

$$x_1 = 3+2\sqrt{15} \;/\; 3-2\sqrt{15}$$

Distance formula Based Qs.

HW.

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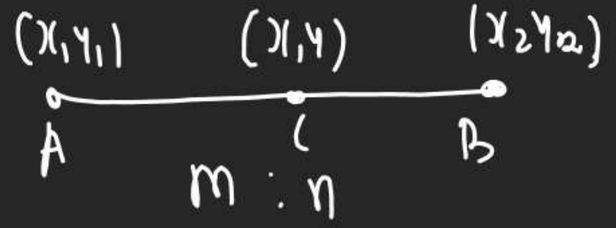
* Division

- Internal
- External.

When C lies betⁿ A & B

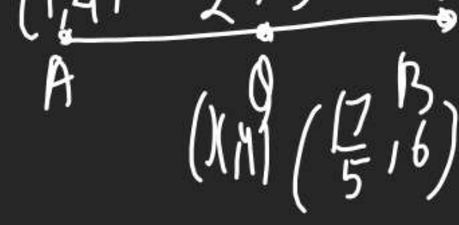
When C lies outside AB.

Internal Division



$$x = \frac{mx_2 + nx_1}{m+n} \qquad y = \frac{my_2 + ny_1}{m+n}$$

Q Find coord of Pt. Q (x,y) such that $\frac{AQ}{BQ} = \frac{2}{3}$ where A = (1,4) & B = (7,9)



$x = \frac{2\times7 + 3\times1}{2+3} = \frac{17}{5}$

$y = \frac{2\times9 + 3\times4}{2+3} = \frac{30}{5} = 6$

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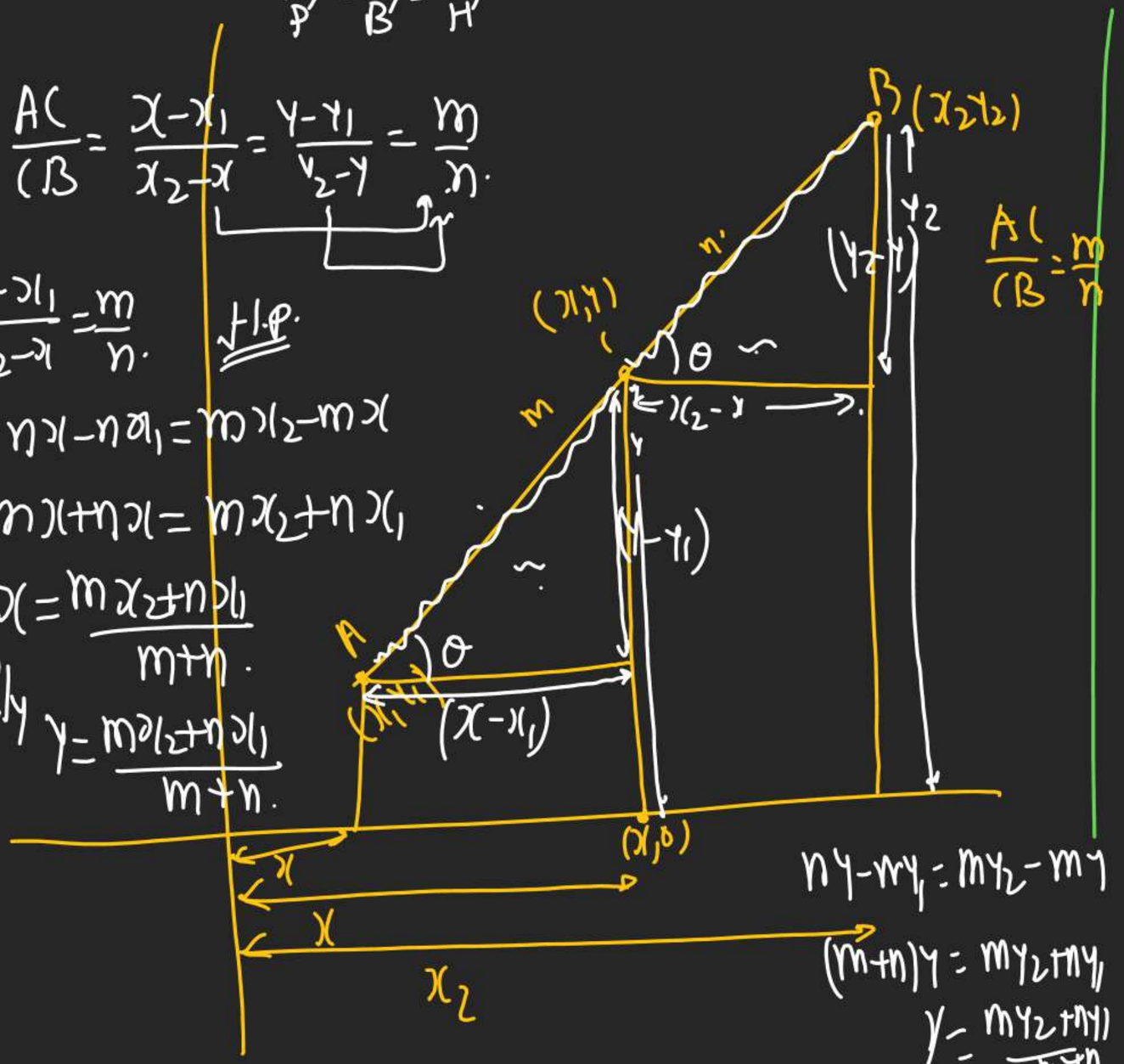
$$\frac{P}{P'} = \frac{B}{B'} = \frac{H}{H'}$$



$$\frac{AC}{CB} = \frac{x-x_1}{x_2-x} = \frac{y-y_1}{y_2-y} = \frac{m}{n}$$

$$\frac{AC}{CB} = \frac{m}{n}$$

$$\frac{x-x_1}{x_2-x} = \frac{m}{n} \quad \text{by t.p.}$$

$$\Rightarrow nx - nx_1 = mx_2 - mx$$

$$mx + nx = mx_2 + nx_1$$

$$x = \frac{mx_2+nx_1}{m+n}$$

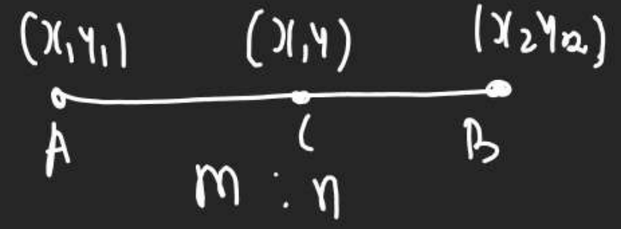
Sly $y = \frac{my_2+ny_1}{m+n}$

$$ny - ny_1 = my_2 - my$$

$$(m+n)y = my_2 + ny_1$$

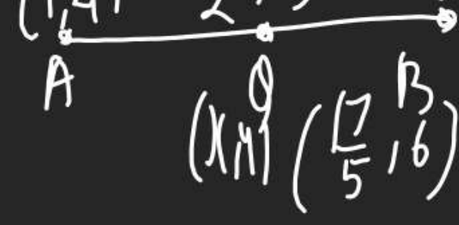
$$y = \frac{my_2+ny_1}{m+n}$$

Internal Division



$$x = \frac{mx_2+nx_1}{m+n} \qquad \Delta y = \frac{my_2+ny_1}{m+n}$$

Q Find coord of Pt. Q (x,y) such that $\frac{AQ}{BQ} = \frac{2}{3}$ where A = (1,4) & B = (7,9)



$$x = \frac{2\times7+3\times1}{2+3} = \frac{17}{5}$$

$$y = \frac{2\times9+3\times4}{2+3} = \frac{30}{5} = 6$$

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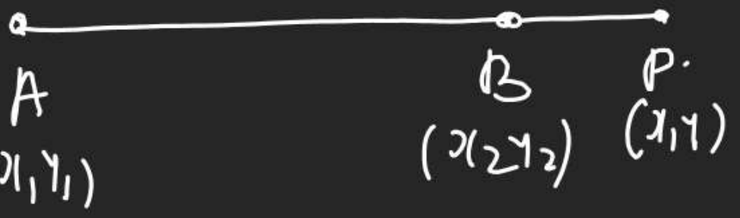
External division.

1) 

P is Externally dividing AB.

$$\frac{AP}{PB} = \frac{m}{n} > 1$$

2) If $\frac{AP}{PB} = \frac{m}{n} < 1$

(3) If $\frac{AP}{PB}$ is -ve Ratio then it is External Division

(4) $\frac{AP}{PB} = -\frac{2}{3}$

Externally Divide.

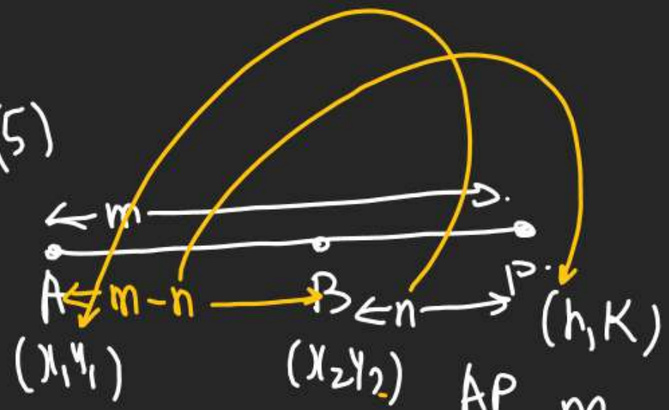
$\frac{2}{3} < 1$

$\frac{AP}{PB} = -\frac{3}{2}$

$\ominus$ → Externally divide.

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

(5)



$\frac{AP}{PB} = \frac{m}{n}$

Let B is Internally dividing AP

(M1) Ratio $(m-n) : n$

$$x_2 = \frac{(m-n)h + nx_1}{m-n+n}$$

$$mx_2 = (m-n)h + nx_1$$

$$mx_2 - nx_1 = (m-n)h.$$

$$\left(h = \frac{mx_2 - nx_1}{m-n}\right)$$

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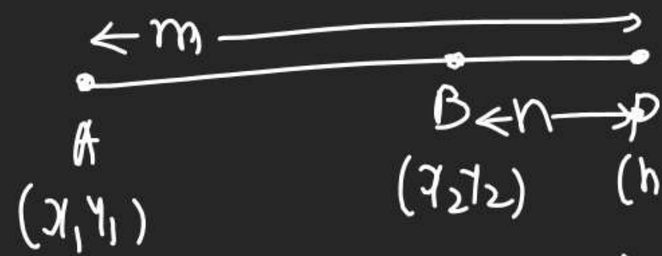
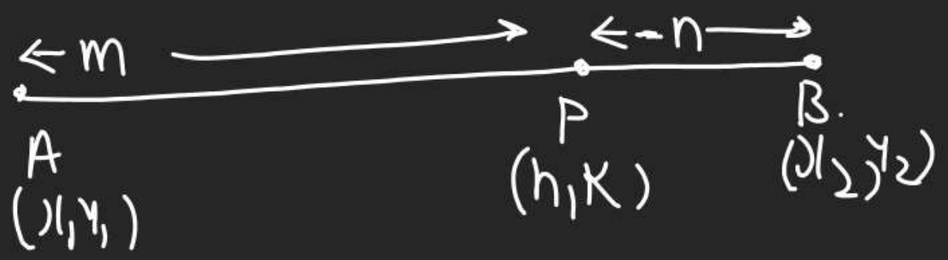
(6) for Solving Qs.

Chataai Ka Phool



$$\frac{AP}{PB} = \frac{m}{n}$$



$$h = \frac{mx_2 + nx_1}{m+n} = \frac{mx_2 - nx_1}{m-n}$$

$$k = \frac{my_2 - ny_1}{m-n}$$

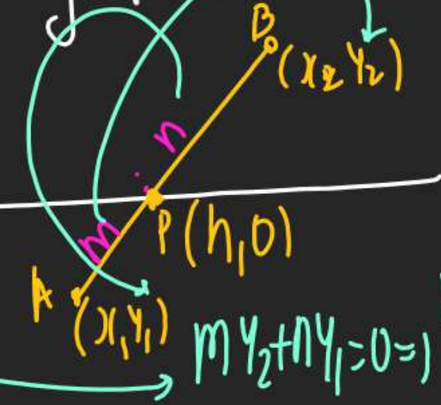
Mid Pt.

$$h = \frac{1x_2 + 1x_1}{1+1}$$

$$k = \frac{1y_2 + 1y_1}{1+1}$$

$$(h,k) \equiv \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

R_K : Ratio in which line joining 2 pts (x_1,y_1) & (x_2,y_2) is cut by X Axis



$\frac{AP}{PB} = \frac{m}{n}$

X Axis

$$0 = \frac{my_2 + ny_1}{(m+n)}$$

$$my_2 + ny_1 = 0 \Rightarrow my_2 = -ny_1 \Rightarrow \boxed{\frac{m}{n} = \frac{-y_1}{y_2}}$$

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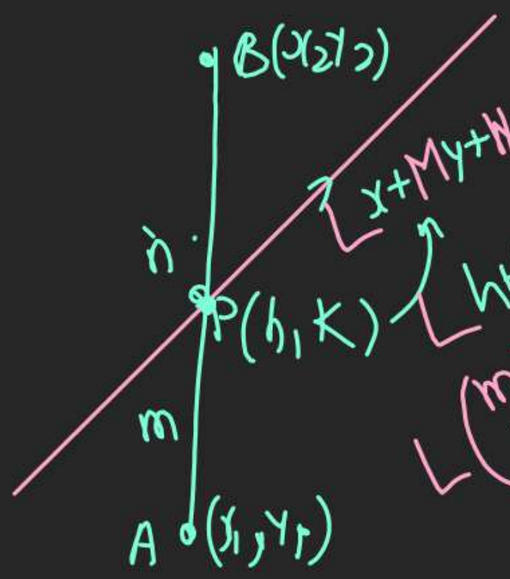
(1) line joining (x_1,y_1) & (x_2,y_2) is cut by X Axis then Ratio $= -\frac{y_1}{y_2}$

(2) line joing (x_1,y_1) & (x_2,y_2) is cut by Y Axis then Ratio $= -\frac{x_1}{x_2}$

(3) Line joining (x_1,y_1) & (x_2,y_2) is cut by $Lx+My+N=0$ then.

$$\text{Ratio} = -\frac{(Lx_1+My_1+N)}{(Lx_2+My_2+N)}$$



$$L\left(\frac{mx_2+nx_1}{m+n}\right)+M\left(\frac{my_2+ny_1}{m+n}\right)+N=0$$

$$Lmx_2+Lnx_1+Mmy_2+Mny_1+mN+nN=0$$

$$m(Lx_2+My_2+N) = -n(Lx_1+My_1+N)$$

$$\frac{m}{n} = -\frac{Lx_1+My_1+N}{Lx_2+My_2+N}$$

$$h=\frac{mx_2+nx_1}{m+n},\quad K=\frac{my_2+ny_1}{m+n}$$

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Note

1) Slope of Line = $\tan\theta = m$.

2) $m = \tan\theta = \frac{(y_2 - y_1)}{(x_2 - x_1)}$

Q Slope of line joining A(1,8), B(3,9)?

$$\text{Slope} = m = \frac{9-8}{3-1}$$

$$(Sl) = \frac{1}{2}$$

(3) When 2 lines are $\parallel^{r}$ their slope is same

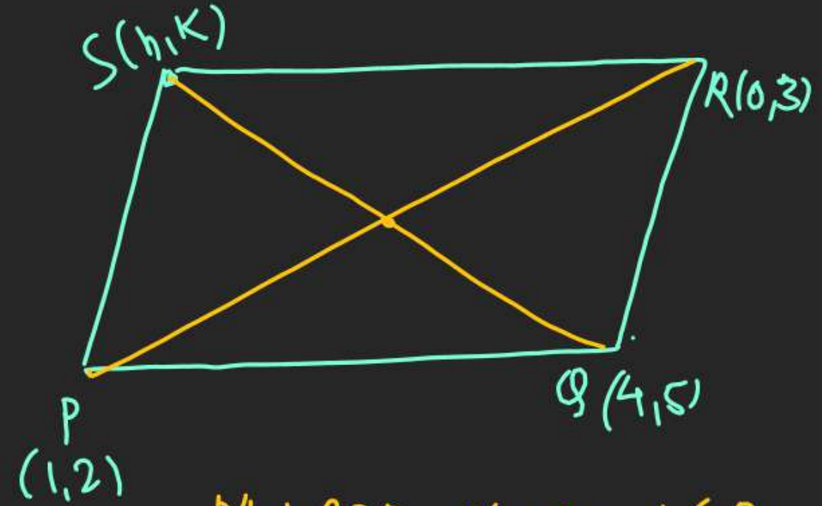
$\Rightarrow m_1 = m_2$

(4) When 2 Lines of slope m_1, m_2 are $\perp^{r}$ to each other $m_1 \cdot m_2 = -1$

Q. P(1,2), Q(4,5), R(0,3) find Coord of S if PQRS is a llgm or Rhombus or Sq or Rectangle

ये चारों आपस में same hain

Sub Ki mid Point of diagonal coincident hota hai!



Mid of PR = Mid Pt. of SQ

$$\left(\frac{1+0}{2}, \frac{2+3}{2}\right) = \left(\frac{h+4}{2}, \frac{K+5}{2}\right)$$

$\frac{h+4}{2} = \frac{1}{2}$ | $\frac{K+5}{2} = \frac{5}{2}$

$h = -3, \quad K = 0$

$\therefore S = (-3, 0)$

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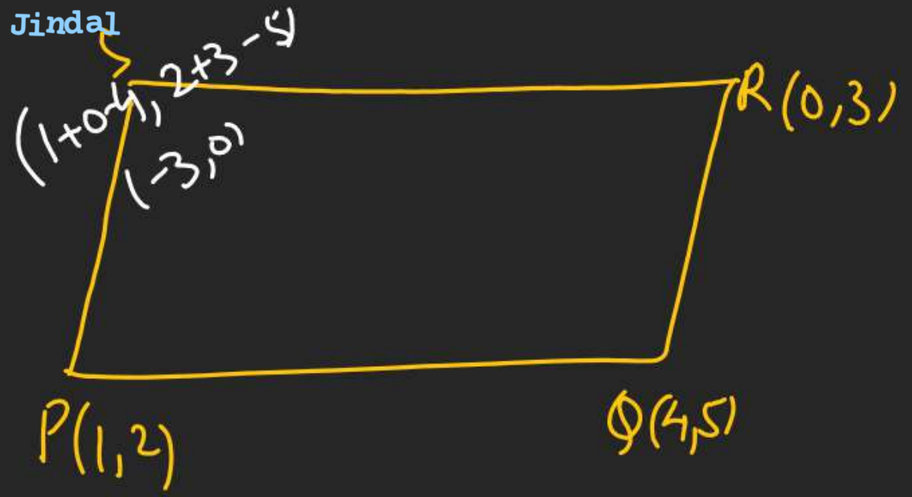
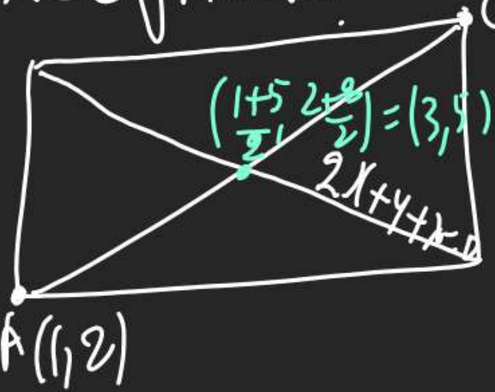


Aamne Samne ka Sum – Sidewala.

Q If 2 opp. vertices of Rectangle are (1,2) & (5,8) & 2nd diagonal's Eqn is $2x+y+\lambda=0$ find λ=?

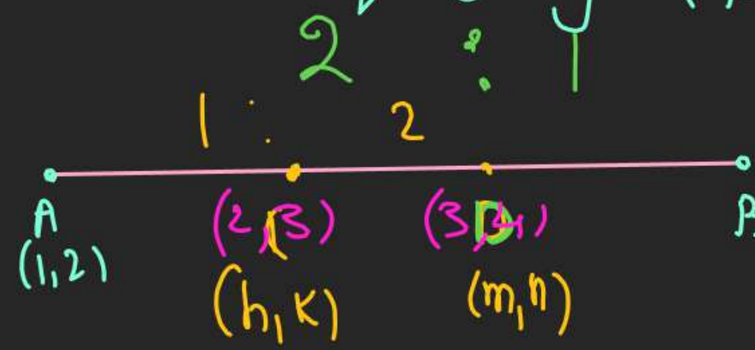


Mid Pt of AC will lie on $2x+y+\lambda=0$

$2\times3+5+\lambda=0$

$\boxed{\lambda=-11}$

Q Find Trisection Pts of line joining Pts. (1,2) & (4,5)



difference in x: $\frac{3}{3} \ominus = 1$ ← Tri

$h = \frac{1\times4+2\times1}{1+2}$, $k = \left(\frac{1\times5+2\times2}{1+2}\right)$

$= 2$ $= 3$ $\boxed{(2,3)\ C}$

diff. in y: $\frac{3}{3} \oplus$ ← Tri

C

$\frac{AC}{CB} = \frac{1}{2} = 1:2$

D

$\frac{AD}{DB} = \frac{2}{1}$

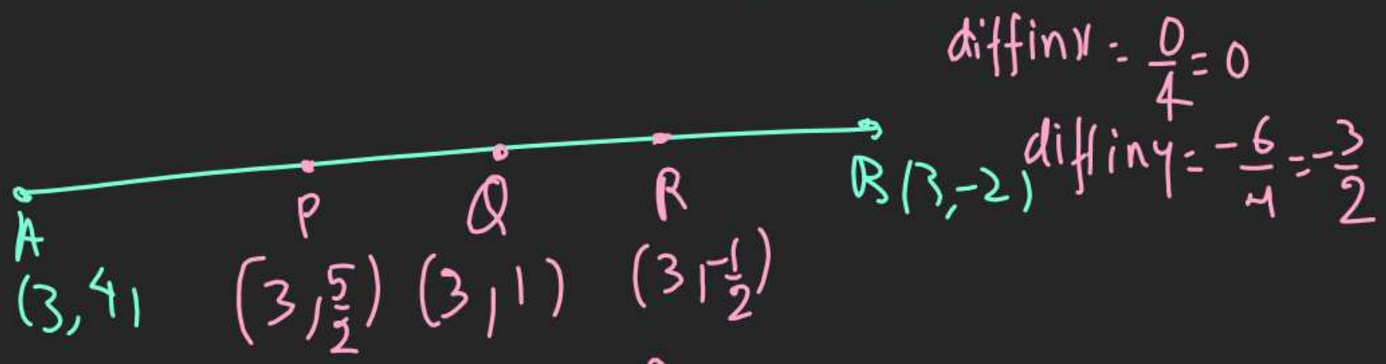
$m = \frac{2\times4+1\times1}{2+1}$, $n = \frac{2\times5+1\times2}{2+1}$

$= 3$ $= 4$ $D = (3,4)$

Regular Ratios me Coordinates AP ki Trick

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 रहे है



diffinx = $\frac{0}{4} = 0$

diffiny = $\frac{-6}{4} = -\frac{3}{2}$

Q 8-16 HW