

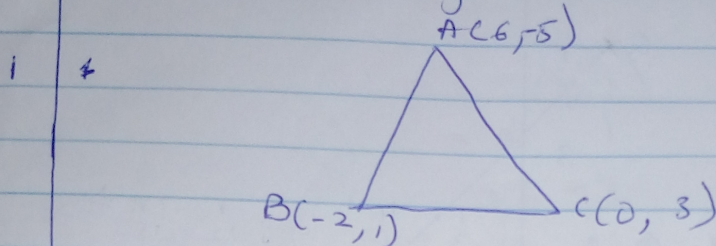
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Subject ~~514/20~~ MAT 102

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Assignment



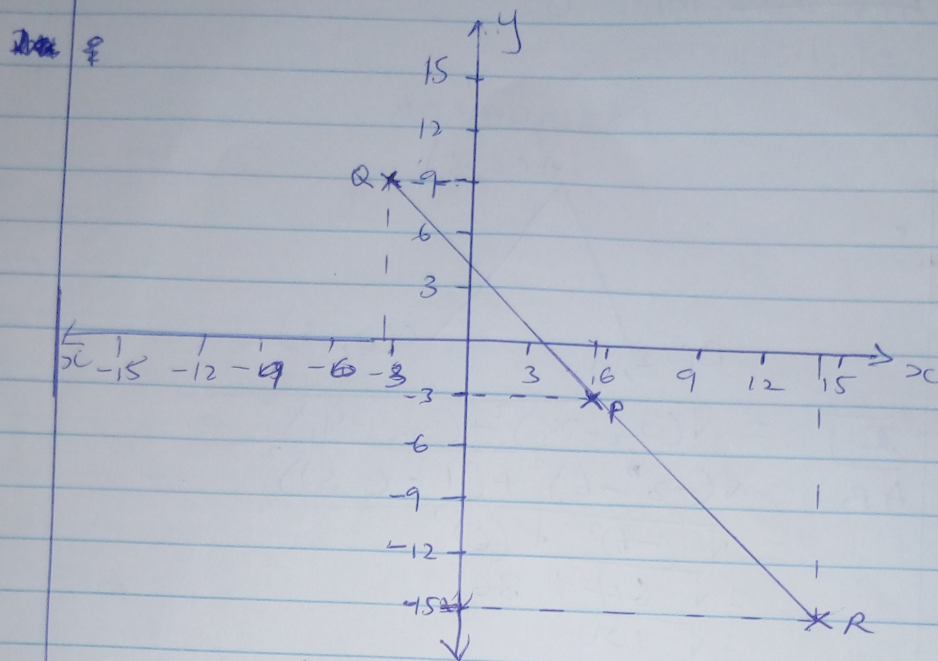
$$\begin{aligned} \overline{AB} &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ \overline{AB} &= \sqrt{(-2 - 6)^2 + (1 - 5)^2} \\ &= \sqrt{(-8)^2 + (-4)^2} \\ &= \sqrt{64 + 16} \\ &= \sqrt{80} \\ &= 4\sqrt{5} \end{aligned}$$

$$\begin{aligned} \overline{BC} &= \sqrt{(0 - (-2))^2 + (3 - 1)^2} \\ &= \sqrt{(0 + 2)^2 + (2)^2} \\ &= \sqrt{2^2 + 2^2} \\ &= \sqrt{4 + 4} \\ &= \sqrt{8} \\ &= 2\sqrt{2} \end{aligned}$$

$$\begin{aligned} \overline{AC} &= \sqrt{(0 - 6)^2 + (3 - 5)^2} \\ &= \sqrt{(0 - 6)^2 + (-2)^2} \\ &= \sqrt{(-6)^2 + (-2)^2} \\ &= \sqrt{36 + 4} \\ &= \sqrt{40} \\ &= 2\sqrt{10} \end{aligned}$$

In an Isosceles triangle, two <sup>opposite</sup> sides are equal. Therefore in the triangle below <sup>it forms an</sup>  $\overline{AB} = \overline{AC}$ . This means that ~~the two points~~  $\overline{AB}$  and  $\overline{AC}$  isosceles triangle.

$$2 \quad P(5, -3) \quad Q(-4, 9) \quad R(14, -15)$$



2a P divides  $\overline{QR}$  internally

$$(x_1, y_1) = Q \quad x_1 = -4$$

$$(x_2, y_2) = R \quad x_2 = 14$$

$$(x, y) = P \quad x = 5$$

$$\text{Using } x = \frac{Lx_1 + Kx_2}{L+K}$$

$$5 = \frac{L(-4) + K(14)}{L+K}$$

$$5(L+K) = -4L + 14K$$

$$5L + 5K = -4L + 14K$$

$$5L + 4L = 14K - 5K$$

$$9L = 9K$$

$$L = K$$

$\therefore$  ratio  $K : L = 1 : 1$

2b R divides  $\overline{PQ}$  externally

$$(x_1, y_1) = P \quad y_1 = -3$$

$$(x_2, y_2) = Q \quad y_2 = 9$$

$$(x, y) = R \quad y = -15$$

$$y = \frac{ly_1 - ky_2}{l - k}$$

$$-15 = \frac{l(-3) - k(9)}{l - k}$$

$$-15(l - k) = -3l - 9k$$

$$-15l + 15k = -3l - 9k$$

$$-15l + 3l = -9k - 15k$$

$$-12l = -24k$$

$$\therefore \text{ratio } k:l = 2:1$$