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MECHANICAL ENGINEERING

19/ENG06/015

MAT 102

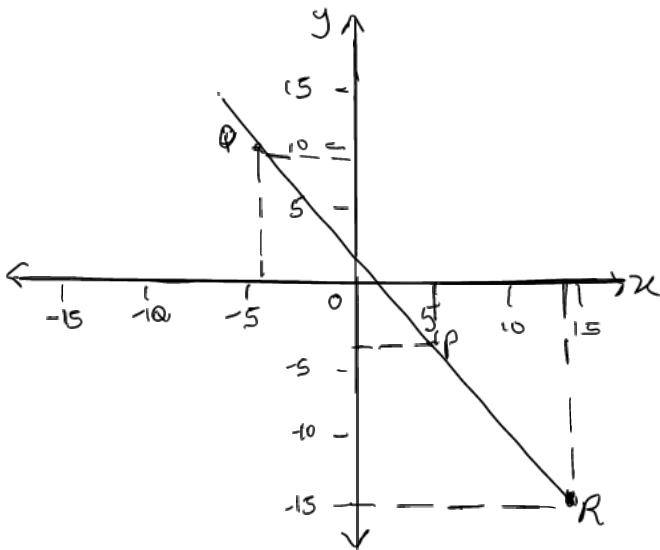
1) Triangle ABC has 3 parts

A (6, -5), B (-2, 1), C (0, 3)

$$\begin{aligned}\text{Line } |AB| &= \sqrt{(-2-6)^2 + (1+5)^2} \\ &= \sqrt{(-8)^2 + 6^2} \\ &= \sqrt{64+36} \\ &= \sqrt{100} = 10\end{aligned}$$

$$\begin{aligned}\text{Line } |CA| &= \sqrt{(6-0)^2 + (-5-3)^2} \\ &= \sqrt{6^2 + (-8)^2} \\ &= \sqrt{36+64} \\ &= \sqrt{100} = 10\end{aligned}$$

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



2a) P divided QR internally

$$(x,y) = P (5,- 3)$$

$$(x_1,y_1) = Q (- 4,9)$$

$$(x_2,y_2) = R (14,- 15)$$

$$\text{Using, } X = \frac{l x_1 + k x_2}{l + k}$$

$$5 = \frac{l(-4) + k(14)}{l + k}$$

$$5(l+k) = -4l + 14k$$

$$9l = 9k$$

$$\text{Ratio } k:l = 1:1$$

b) R divides PQ internally

$$(x,y) = R (14,- 15)$$

$$(x_1,y_1) = P (5,- 3)$$

$$(x_2,y_2) = Q (- 4,9)$$

$$\text{Using, } X = \frac{l x_1 - k x_2}{l - k}$$

$$14 = \frac{l(5) - k(-4)}{l - k}$$

$$14(l - k) = l(5) - k(-4)$$

$$14l - 14k = 5l + 4k$$

$$9l = 18k$$

$$\text{Ratio } k:l = 2:1$$