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Computer Engineering
Matric No: 19/ENG02/1004

1 Show that the points A(6,-5), B(-2,1) C(0,3) form an isosceles triangle

2 Points P, Q and R are point (5,-3), (4,-9) and (14,-1) respectively. Find the Ratio which (a) P divides QR (b) R divides PQ.

Solution

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

$AB = \sqrt{(6--2)^2 + (1--5)^2}$

$= \sqrt{8^2 + 6^2}$

$= \sqrt{64 + 36}$

$= 10$ sq unit

$BC = \sqrt{(0+2)^2 + (3-1)^2}$

$\sqrt{4+4}$

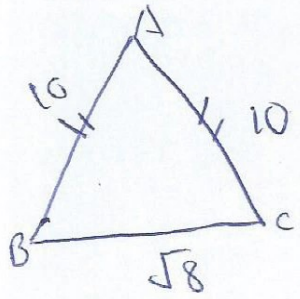
$= \sqrt{8}$ sq unit

$AC = \sqrt{(0+6)^2 + (3+5)^2}$

$= \sqrt{6^2 + 8^2}$

$= \sqrt{36+64}$

$= \sqrt{100}$ sq unit $= 10$ sq unit



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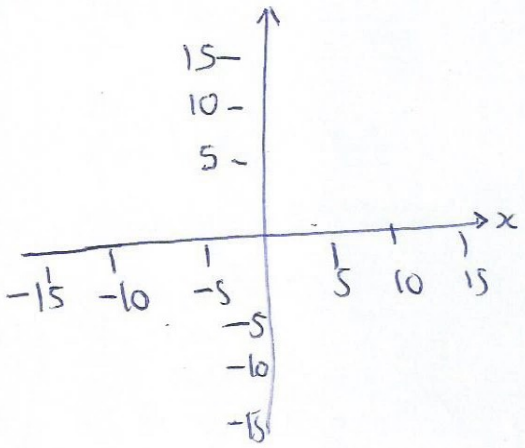

a Internal Division $\Longrightarrow (x,y) = \left(\frac{x_1 + kx_2}{1+k}, \frac{y_1 + ky_2}{1+k}\right)$

Using x

$$5 = \frac{-4L + 14k}{L+k}$$

$$5L + 5k = 14L + 14k$$

$$9L = 9k$$

The ratio which P divides QR is 1:1.

b External Vision $\Longrightarrow (x,y) = \left(\frac{x_1 L - x_2 k}{L+k}, \frac{y_1 L - y_2 k}{L+k}\right)$

Using y

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

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

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

$$-24L = 18k$$

$$4L = 3k$$

$L/k = 3/4$: Ratio $PQ = 4:3$