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Mechatronics

19/ENG05/063

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

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

$= \sqrt{64+36}$

$= \sqrt{100} = 10$ sq. units

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

$= \sqrt{4+4}$

$= \sqrt{8}$ sq. units

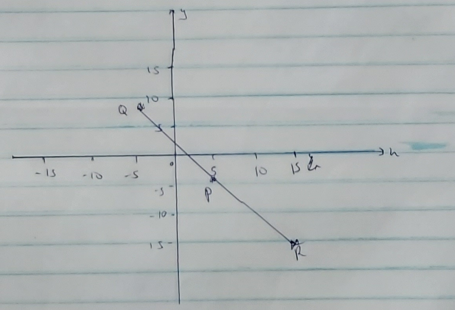
$AC = \sqrt{(0-6)^2 + (3+5)^2}$

$= \sqrt{36+64}$

$= \sqrt{100} = 10$ sq. units

It is an isosceles triangle since two of it's sides are equal.

2a



a Internal division $\Rightarrow (x, y) = \frac{lx_1 + kx_2}{l+k}, \frac{ly_1 + ky_2}{l+k}$

Using x

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

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

$9l = 9k$

The ratio P divides QR is 1:1

External division $\Rightarrow (x,y) = \frac{x_1 l - x_2 k}{l+k}, \frac{y_1 l - y_2 k}{l+k}$

Using y

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

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

$$-24l = 18k$$

$$4l = 3k$$

$$\frac{l}{k} = \frac{3}{4} \quad \frac{k}{l} = \frac{4}{3}$$

The ratio that R divides PQ = 4:3