

MAT1102

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COMPUTER ENGINEERING

19/ENG02/025

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

$$\overline{AB} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(-2 - 6)^2 + (1 - (-5))^2}$$

$$\overline{AB} = \sqrt{(-8)^2 + (6)^2} = \sqrt{100}$$

$$\overline{AB} = 10.$$

$$\overline{AC} = \sqrt{(0 - 6)^2 + (3 - (-5))^2} = \sqrt{(-6)^2 + (8)^2}$$

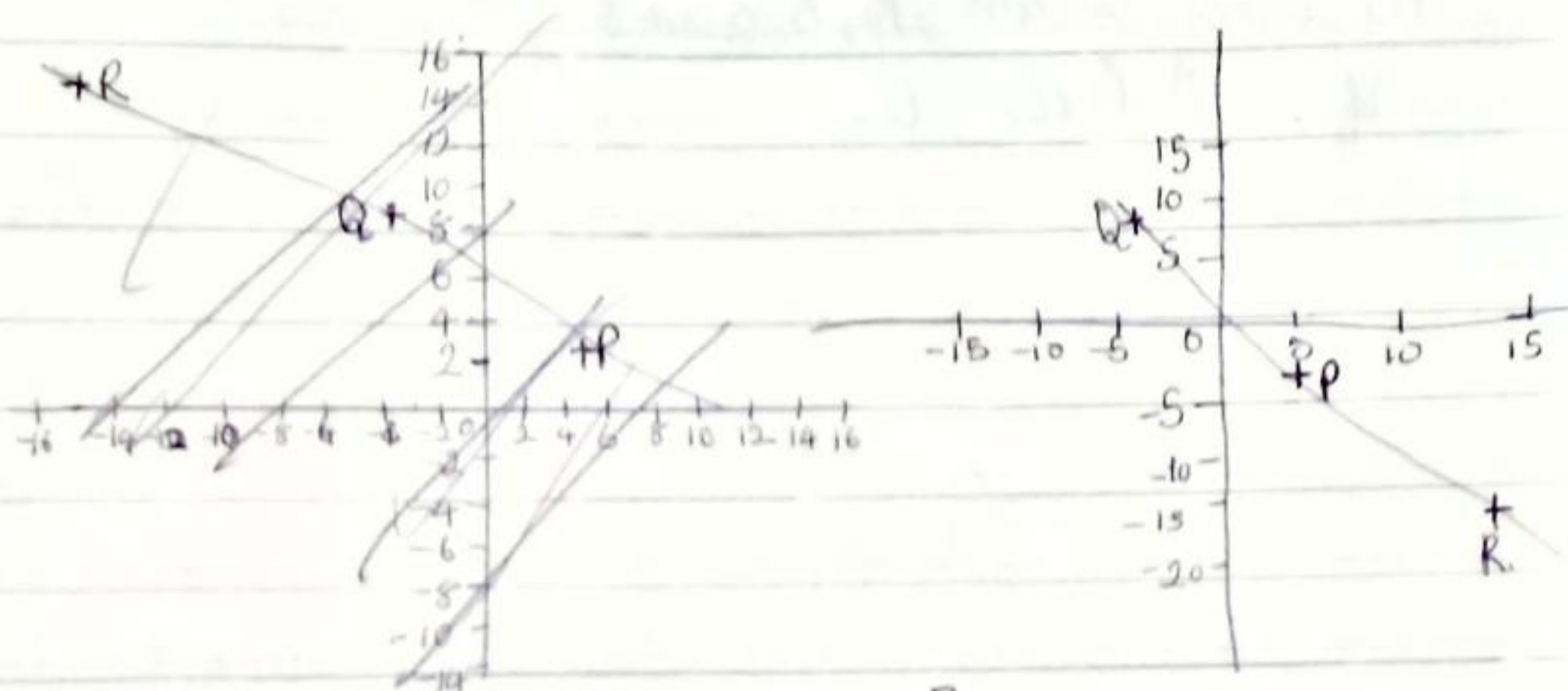
$$\overline{AC} = \sqrt{100} = 10$$

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

$$\overline{BC} = 2\sqrt{2}$$

Since 2 sides are equal, the points $A(6, -5)$, $B(-2, 1)$ and $C(0, 3)$ form an isosceles triangle.

2. If P, Q and R are points (5, -3), (-4, 9) and (14, -15) respectively, find the ratio in which
 a. P divides QR.



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

$$y_1 = -3$$

$$y_2 = -15$$

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

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

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

$$-12l = -12k$$

$$l = k$$

ratio $k:l = 1:1$

b. R divides PQ

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

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

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

$$-12l = -24k$$

$$l = 2k$$

ratio $k:l = 2:1$