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MAT102 Assignment

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

An Isosceles triangle is a triangle in which only 2 of its sides are equal.

$\bar{AB} = \sqrt{(6+2)^2+(-5-1)^2} = \sqrt{64+36} = \sqrt{100} = 10$

$\bar{AC} = \sqrt{(6-0)^2+(-5-3)^2} = \sqrt{36+64} = \sqrt{100} = 10$

$\bar{BC} = \sqrt{(-2-0)^2+(1-3)^2} = \sqrt{4+4} = \sqrt{8} = 2$

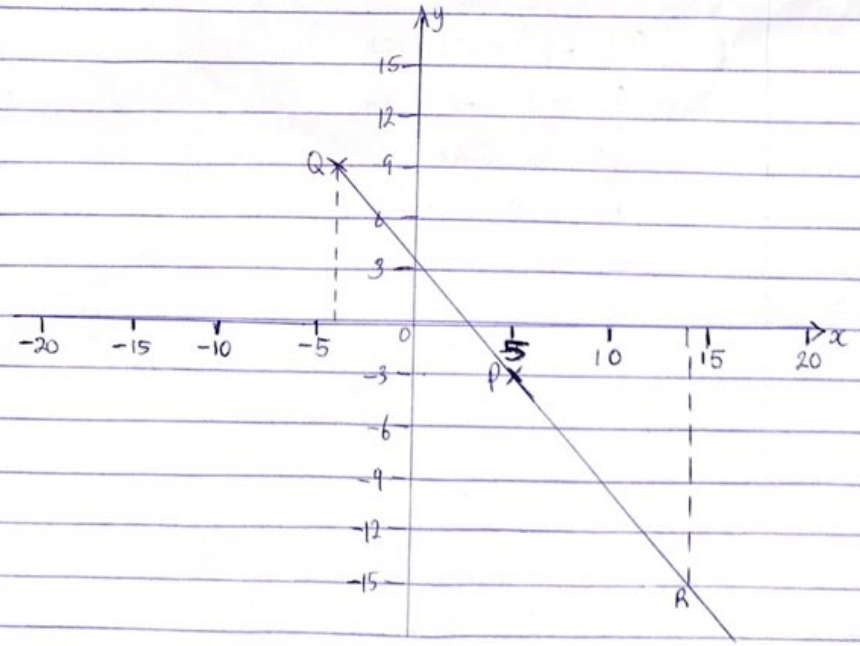
Since $\bar{AB} = \bar{AC} \neq \bar{BC}$ therefore it is an Isosceles triangle.

2) P(5, -3), Q(-4, 9) and R(14, -15)

$x_1 = 5$ $y_1 = -3$

$x_2 = -4$ $y_2 = 9$

$x_3 = 14$ $y_3 = -15$



a) P divides $\bar{QR}$ internally therefore, x_1 x_2

From the graph the line $\bar{QR}$ gives $(x,y) = (-4,14)$

Using $x = \frac{lx_1 + kx_2}{l + k}$

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

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

$9l = 9k$

$\therefore$ Ratio $k:l = 1:1$

b) R divides $\bar{PQ}$ externally therefore,

From the graph the line $\bar{PQ}$ gives $(x,y) = (5,-3)$

$y_1 = -3$, $y_2 = -15$, $y = 9$

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

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

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

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

$12l = 24k$

$\therefore$ Ratio $k:l = 2:1$