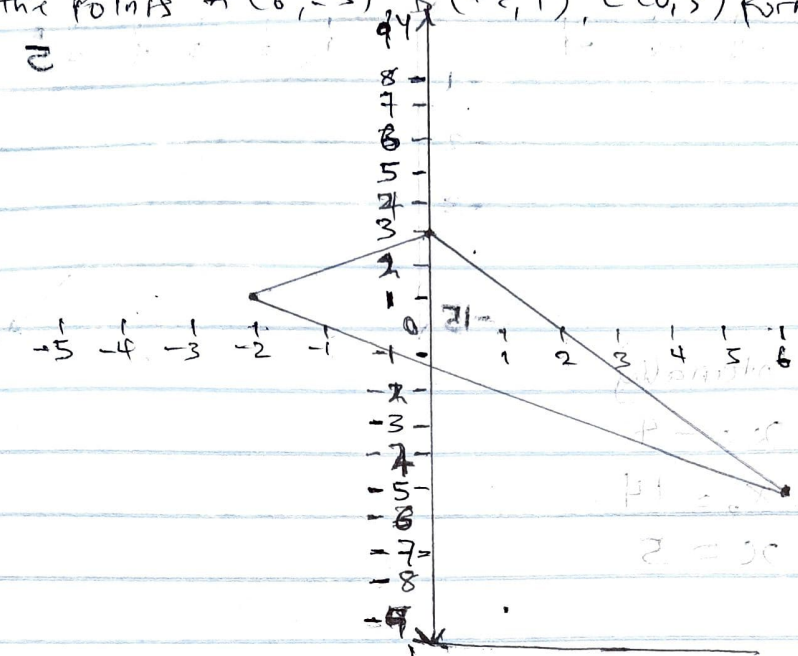
NWOKORIE PASCAL CHINAMDI
MECHATRONICS ENGINEERING
MAT 102
19/ENG05/043

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



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

$= \sqrt{36+64} = \sqrt{100}$

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

$= \sqrt{36+64} = \sqrt{100}$

$= 10$

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

$= \sqrt{4+4}$

$= \sqrt{8}$

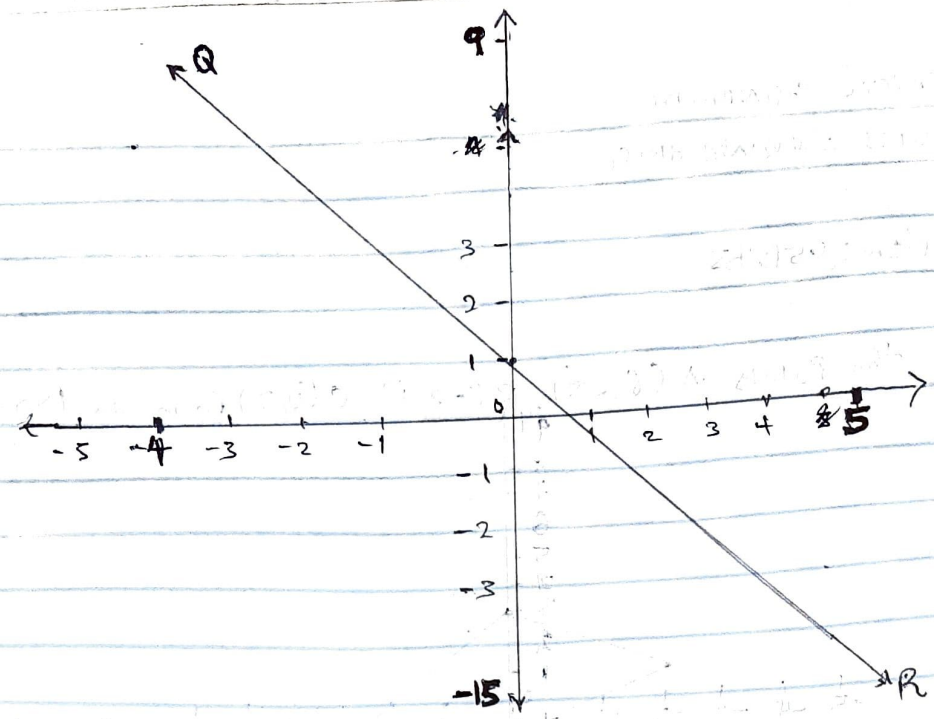
The points A (6, -5), B (-2, 1), C (0, 3) form an isoceles triangle because two lines are equal

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

a) P divides QR

R divides PQ

Solution



P divides QR, Internally

Q (x_1, y_1) ; $x = -4$

R (x_2, y_2) ; $x_2 = 14$

P (x_3, y_3) ; $x = 5$

Using

$$x = \frac{lx_2 + kx_1}{l+k}$$

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

$$\Rightarrow 14l - 5l = 5k + 4k \Rightarrow 9k = 9l.$$

Ratio $k:l$ is $1:1$

Hence P divides QR internally in the ratio $1:1$

R divides PQ ; Externally

Using $y = \frac{ly_2 - ky_1}{l-k}$

Where P = $y_1 = -3$

Q = $y_2 = 9$

R = $y_3 = -15$

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

$$\Rightarrow -15l + 15k = 9l + 3k.$$

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

$$\Rightarrow 24l = 12k \quad \therefore \text{Ratio } k:l \text{ is } 1:2$$

Hence R divides PQ externally in the ratio $1:2$.