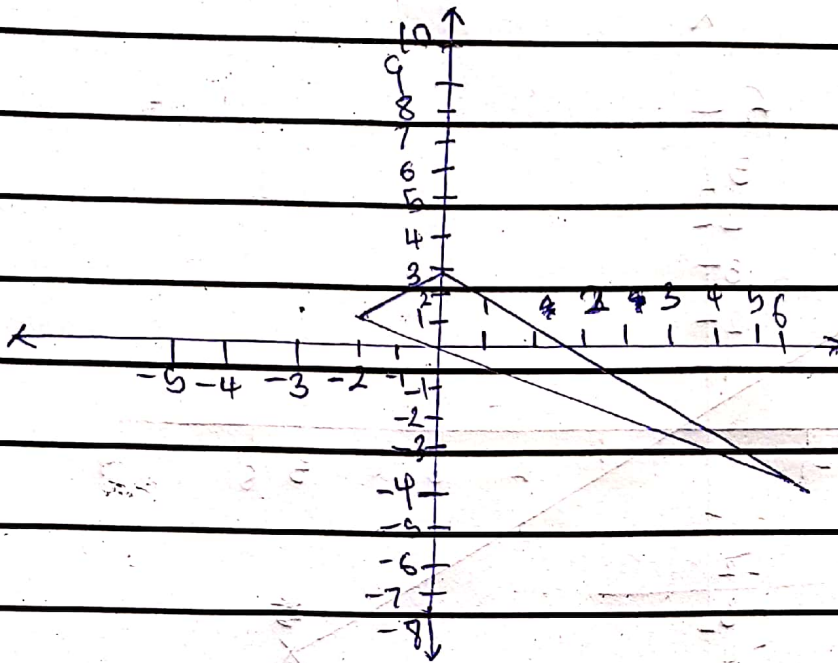


1)



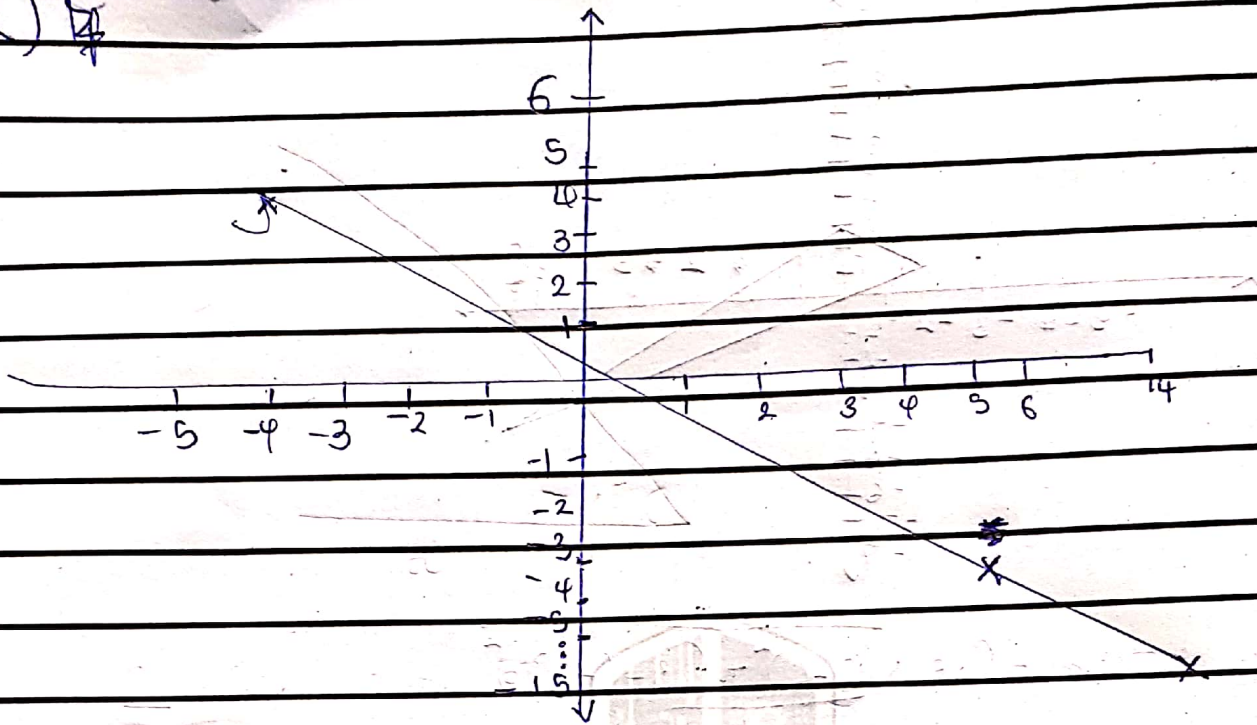
$$\begin{aligned} \text{Distance between AC} &= \sqrt{(0-(-2))^2 + (3-(-6))^2} \\ &= \sqrt{36 + 64} \\ &= 10 \end{aligned}$$

$$\begin{aligned} AB &= \sqrt{(-2-1)^2 + (-6-(-5))^2} \\ &= \sqrt{64 + 36} \\ &= 10 \end{aligned}$$

$$\begin{aligned} BC &= \sqrt{(0-(-2))^2 + (3-(-6))^2} \\ &= \sqrt{4 + 4} \\ &= \sqrt{8} \end{aligned}$$

Points A, B & C forms an isosceles triangle because two sides are equal

2) ~~4~~



P divides QR internally

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

$$R = (x_2, y_2); x_2 = 1$$

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

Using

$$x = \frac{l x_1 + k x_2}{1 + k}$$

$$5 = \frac{l(-4) + k(1)}{1 + k}$$

$$5(1+k) = -4l + 1k$$

$$5l + 5k = -4l + 1k$$

$$14k - 9k = 5l + 4l$$

$$5k = 9l$$

$$\therefore k:l = 9:5$$

Since l divides QA internally by $1:1$ the R divides QA externally

$$\text{Using } y = \frac{ly - ky}{l - k}$$

$$\text{where } P = y_1 = -3$$

$$Q = y_2 = 9$$

$$R = y = -15$$

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

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

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

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

$$-6k = -18l$$

\therefore Externally the ratio is $2:1$