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Course: MAT 102

Assignment

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

Sol

Point AB

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

$$x_2 = 6, x_1 = -2$$

$$y_2 = -5, y_1 = 1$$

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

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

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

$$= \sqrt{100} = 10\text{cm}$$

Point BC

$$x_2 = 0, x_1 = -2$$

$$y_2 = 3, y_1 = 1$$

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

$$= \sqrt{4 + 4}$$

$$= \sqrt{8}$$

$$= 2.8\text{cm}$$

Point AC

$$x_2 = 6, x_1 = 0$$

$$y_2 = -5, y_1 = 3$$

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

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

$$= \sqrt{100} = 10\text{cm}$$

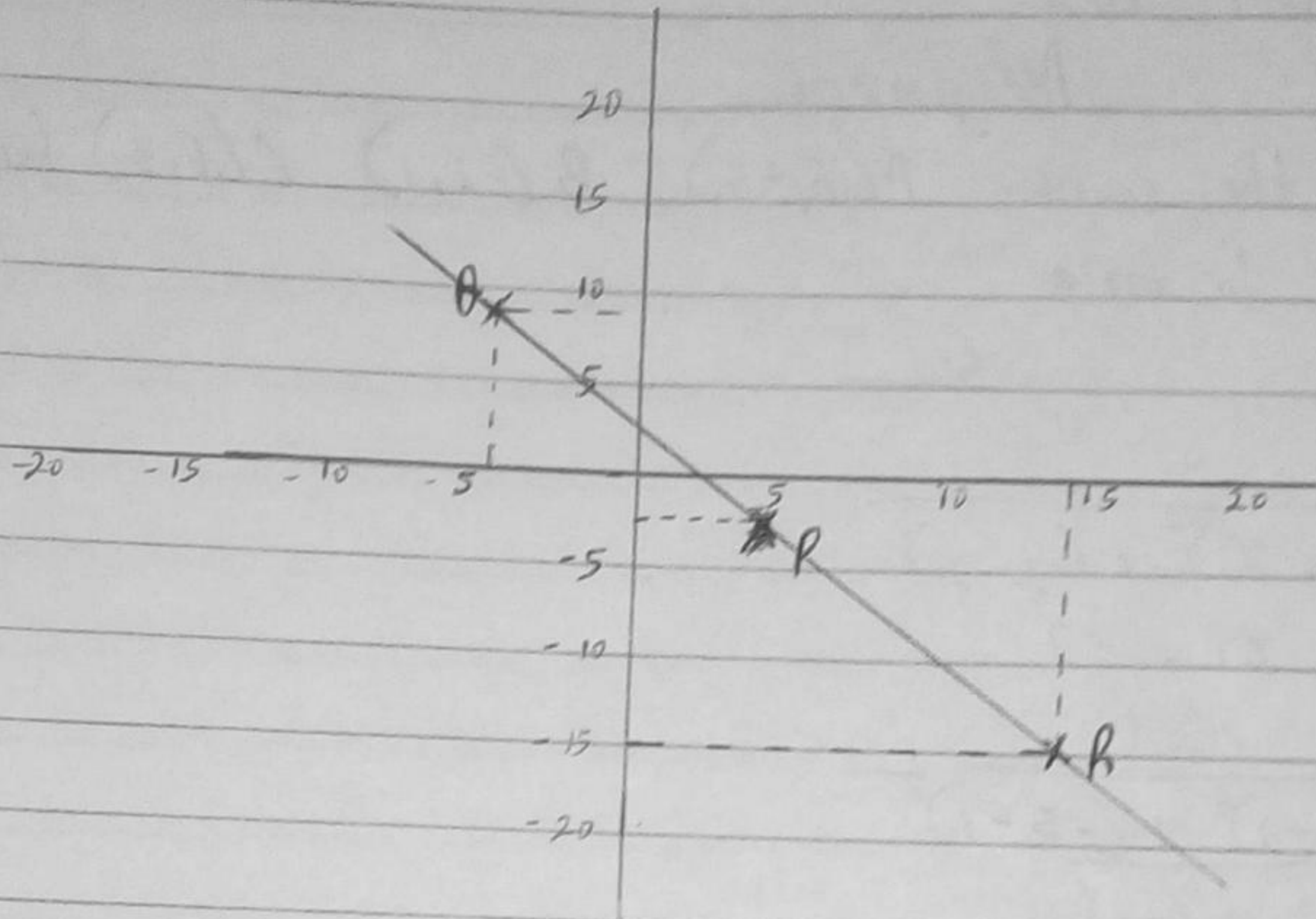
∴ The points form an isosceles triangle since two sides of the triangle are equal.

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

b R divides PQ

②



a P divides \overline{QR} internally

$$(x, y) = (5, -3)$$

$$(x_2, y_2) = (14, -15)$$

$$(x_1, y_1) = (-4, 9)$$

$$\text{Using } x = \frac{lx_1 + hx_2}{l+h}$$

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

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

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

$$9l = 9h$$

$$\text{Ratio } h:l = 1:1$$

b R divides \overline{PQ} externally

$$(x, y) = (14, -15)$$

$$(x_2, y_2) = (-4, 9)$$

$$(x_1, y_1) = (5, -3)$$

$$\text{Using } y = \frac{ly_1 - hy_2}{l-h}$$

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

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

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

$$24h = 12l$$

$$\text{Ratio } h:l = 2:1$$