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Electrical/Electronics

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MAI 102

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

$$\begin{aligned}\overline{AB} &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ &= \sqrt{(-2 - 6)^2 + (1 - (-5))^2} \\ &= \sqrt{(-8)^2 + (6)^2} \\ &= \sqrt{64 + 36}\end{aligned}$$

$$\overline{AB} = \sqrt{100} = 10 \text{ units}$$

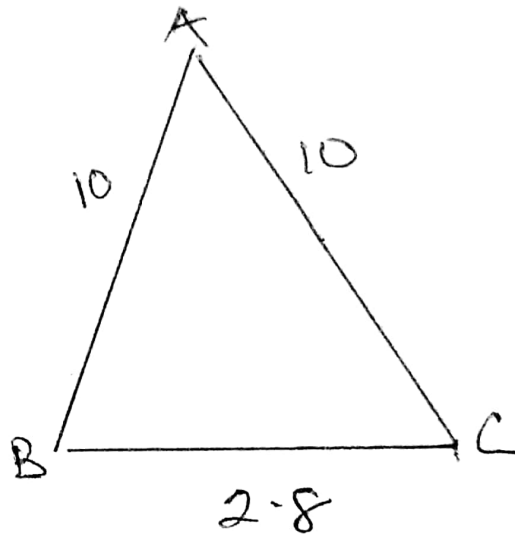
$$\begin{aligned}\overline{BC} &= \sqrt{(0 - (-2))^2 + (3 - 1)^2} \\ &= \sqrt{4 + 4}\end{aligned}$$

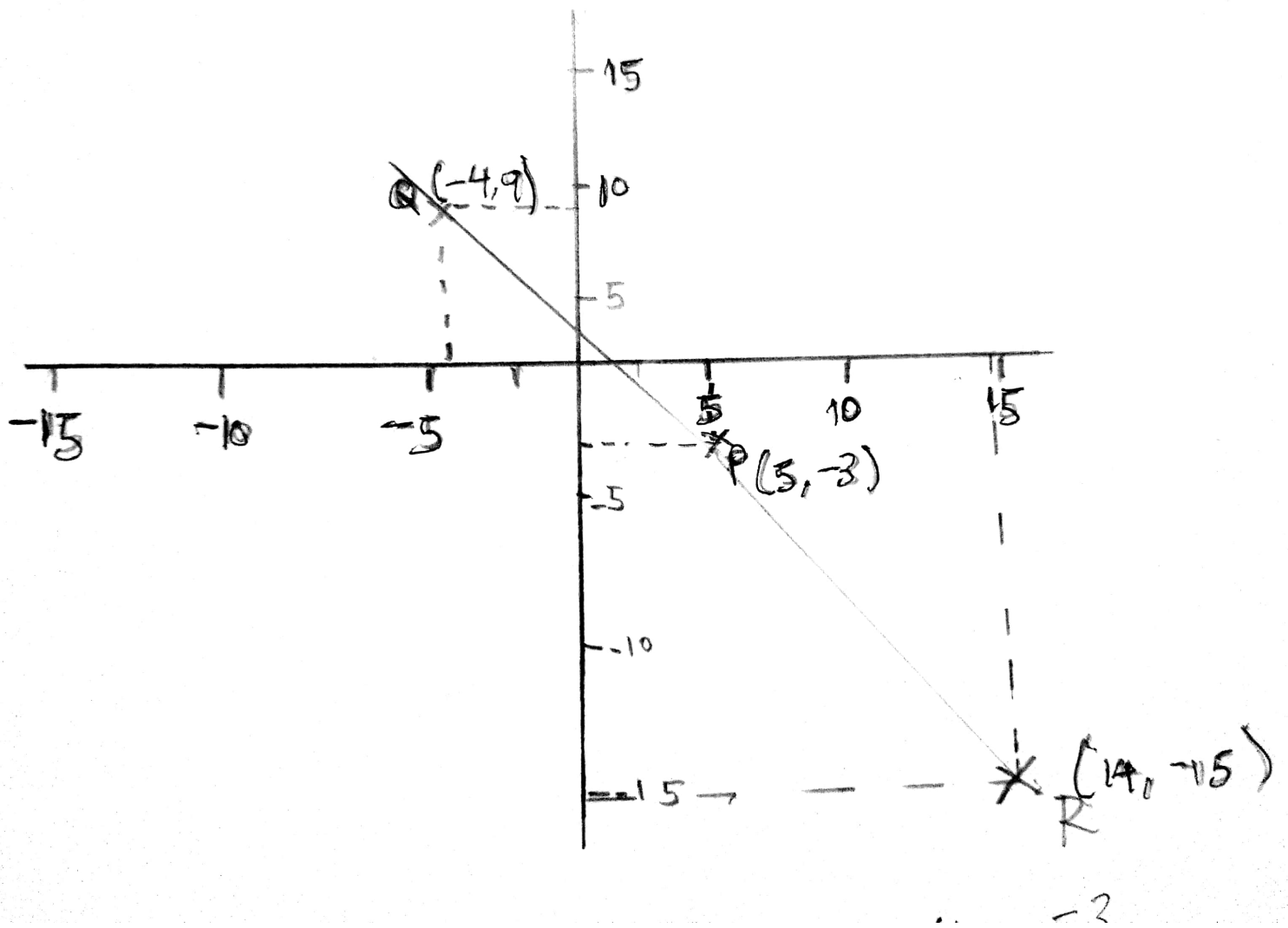
$$\overline{BC} = \sqrt{8} = 2.8 \text{ units}$$

$$\begin{aligned}\overline{AC} &= \sqrt{(0 - 6)^2 + (3 - (-5))^2} \\ &= \sqrt{(-6)^2 + 8^2} \\ &= \sqrt{64 + 36 + 64}\end{aligned}$$

$$\overline{AC} = \sqrt{164} = 12.8 \text{ units}$$

Since  $\overline{AB} = \overline{AC}$ ,  $\triangle ABC$  forms an isosceles triangle.





$$1) \quad (x_1, y_1) = Q \quad x_1 = -4$$

$$(x_2, y_2) = R \quad x_2 = 14$$

$$(x, y) = P \quad x = 5$$

P divides  $\overline{QR}$  internally.

$$x = \frac{Lx_1 + Kx_2}{L+K}$$

$$5 = \frac{L(-4) + K(14)}{L+K}$$

$$5 = \frac{-4L + 14K}{L+K}$$

$$5(L+K) = -4L + 14K$$

$$5L + 5K = -4L + 14K$$

$$5L + 4L = 14K - 5K$$

$$9L = 9K$$

$$\frac{L}{K} = \frac{9}{9}$$

$$L:K = 1:1$$

$$ii) \quad (x_1, y_1) = P \quad y_1 = -3$$

$$(x_2, y_2) = Q \quad y_2 = 9$$

$$(x, y) = R \quad y = -15$$

R divides  $\overline{PQ}$  externally.

$$y = \frac{Ly_1 - Ky_2}{L-K}$$

$$-15 = \frac{L(-3) - K(9)}{L-K}$$

$$-15(L-K) = -3L - 9K$$

$$-15(L-K) =$$

$$-15L + 15K = -3L - 9K$$

$$15K + 9K = -3L + 15L$$

$$24K = 12L$$

$$\frac{L}{K} = \frac{24}{12}$$

$$\frac{L}{K} = \frac{2}{1}$$

$$L:K = 2:1$$