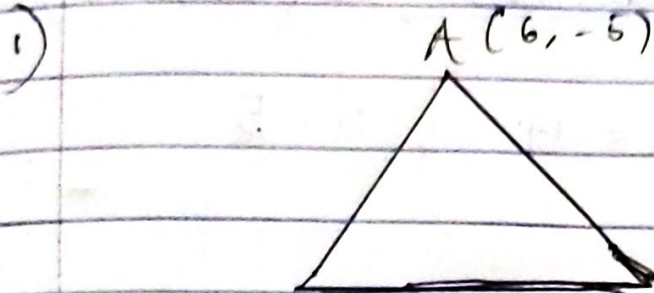


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MAT 102

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B(-2, 1)

C(0, 3)

for an isosceles triangle, $\overline{AB} = \overline{AC} \neq \overline{BC}$

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

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

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

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

$$\overline{AB} = \sqrt{100}$$

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

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

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

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

$$\overline{AC} = \sqrt{100}$$

$$\overline{AC} = 10 \text{ units}$$

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

$$\overline{BC} = \sqrt{2^2 + 2^2}$$

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

$$\overline{BC} = \sqrt{8} = 2\sqrt{2} \text{ units}$$

$$\overline{AB} (10 \text{ units}) = \overline{AC} (10 \text{ units}) \neq \overline{BC} (2\sqrt{2} \text{ units})$$

\therefore It is an isosceles triangle

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

a

P divides QR

$$x_1 = -4, x_2 = 14, x = 5$$

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

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

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

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

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

$$9L = 9K$$

$$\text{Ratio } K:L = 1:1$$

b) R divides PQ $\Rightarrow y = \frac{Ly_1 - Ky_2}{L-K}$

$$PQ \text{ gives } \begin{array}{l} (x_1, y_1) = (5, -3) \\ (x_2, y_2) = (-4, 9) \end{array} \quad \left| \quad (x, y) = (14, -15) \right.$$

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

$$L-K$$

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

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

$$-12L = -24K$$

$$\text{Ratio } K:L = 2:1$$