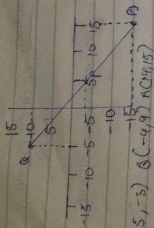


②



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

① P divides QR internally

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

$$(x_1, y_1) = R(4, -15)$$

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

$$\text{Using } x = \frac{mx_2 + nx_1}{m+n}$$

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

$$5(L+k) = -4L + 4k$$

$$9L = 4k$$

$$\text{ratio } k:L = 9:4$$

② P divides QR externally

$$(x, y) = R(4, -15), (x_1, y_1) = Q(-4, 9), (x_2, y_2) = P(5, -3)$$

$$\text{Using } x = \frac{Lx_2 - lx_1}{L-l} \quad \therefore 5 = \frac{L(5) - k(-4)}{L-k}$$

$$14(L-k) = (5L) - k(-4)$$

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

$$9L = 18k$$

$$\text{ratio } k:L = 3:1$$

1) Triangle ABC has the points

$$A(6, -5)$$

$$B(-2, 1)$$

$$C(0, 3)$$

$$\begin{aligned} \text{line } \overline{AB} &= \sqrt{(6-(-2))^2 + (-5-1)^2} \\ &= \sqrt{8^2 + 6^2} \\ &= \sqrt{64 + 36} \\ &= \sqrt{100} \\ &= 10 \end{aligned}$$

$$\begin{aligned} \text{line } \overline{BC} &= \sqrt{(0-(-2))^2 + (3-1)^2} \\ &= \sqrt{2^2 + 2^2} \\ &= \sqrt{4+4} \\ &= \sqrt{8} \end{aligned}$$

$$\begin{aligned} \text{line } \overline{CA} &= \sqrt{(6-0)^2 + (-5-3)^2} \\ &= \sqrt{6^2 + (-8)^2} \\ &= \sqrt{36 + 64} \\ &= \sqrt{100} \\ &= 10 \end{aligned}$$

A triangle is said to be isosceles when two sides are equal. Line  $\overline{AB}$  and  $\overline{AC}$  are equal. Therefore,  $\triangle ABC$  is an isosceles  $\triangle$ .