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① Distance between A and B

$$\sqrt{(x^2-x^1)^2 + (y^2-y^1)^2}$$

$$x_1 = 6, x_2 = -2, y_1 = 5, y_2 = 1$$

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

$$= \sqrt{(-8)^2 + (-4)^2}$$

$$= \sqrt{64+16} = \sqrt{80} = 8\sqrt{2}$$

Between A and C

$$x_1 = 6, y_1 = -5, x_2 = 0, y_2 = 3$$

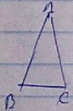
$$= \sqrt{(0-6)^2 + (3-(-5))^2}$$

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

$$= \sqrt{36+64} = \sqrt{100} = 10$$

Between A and B

∴ if line AB and line AC are equal then triangle



is an isosceles triangle

2 ② P divides QR

$$x = \frac{kx_2 + k_1x_1}{k+k_1}$$

$y = \frac{ky_2 + k_1y_1}{k+k_1}$

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

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

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

$$5 = \frac{m/4 - p - 4/5}{m-n} / \frac{(p-n) \cdot 5}{2} = \frac{(m/4 + n/4)}{m-n}$$

Using $x = \frac{Lx_1 + kx_2}{2+k}$

$$5 = \frac{2(-4) + k(14)}{2+k}$$

$$5(2+k) = 2(-4) + k(14)$$

$$52 + 5k = -42 + 14k$$

$$14k - 5k = 52 + 42$$

$$9k = 92$$

$$\therefore \text{ratio } k:2 = 1:1$$

∴ P divides QR internally in

the ratio 1:1

∴ R divides PQ externally

from $y = \frac{2y_1 - ky_2}{2-k}$

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

$$-15 = \frac{2(-3) - k(-9)}{2-k}$$

$$-15(2-k) = 2(-3) - k(-9)$$

$$-152 + 15k = -32 - 9k$$

$$15k + 9k = 152 - 32$$

$$24k = 120$$

$$\text{ratio } k:15 = 2:1$$

Hence R divides PQ internally in the ratio 2:1