

Da Silva Amelucaps
Mechanical Engineering
100 LEVEL

math 102

Matric No: 19/ENTG06/017

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

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

Answers

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

$$AB = \sqrt{(-2-6)^2 + (1+3)^2}$$

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

$$= \sqrt{100} = 10 \text{ square units}$$

$$(2) BC = \frac{\sqrt{(0+2)^2 + (3-1)^2}}{\sqrt{4+4}}$$

$$= \sqrt{8} = 2.83 \text{ square units}$$

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

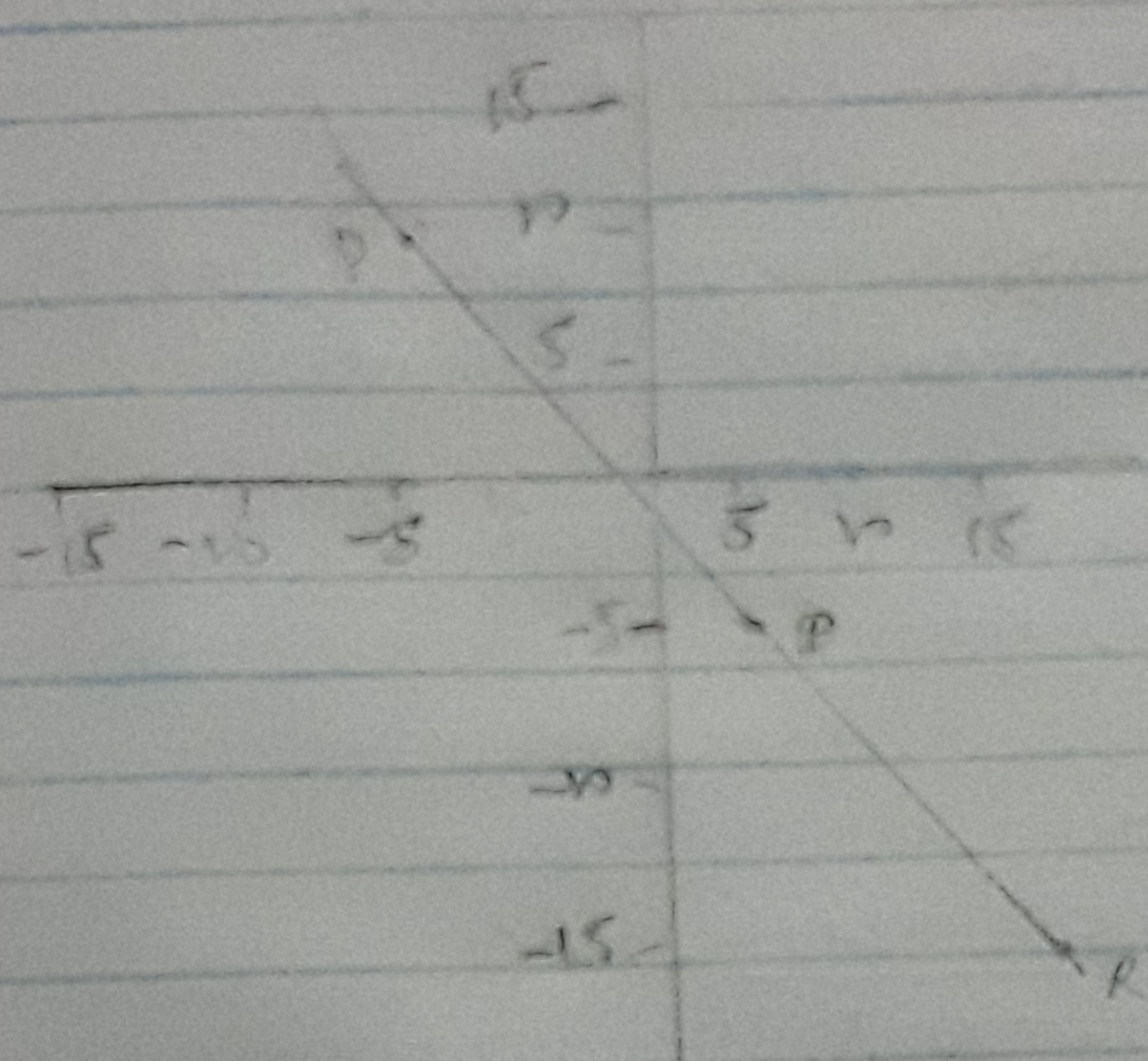
$$= \sqrt{36+64}$$

$$= \sqrt{100}$$

$$= 10 \text{ square units}$$

$\triangle ABC$ is an isosceles triangle because two sides are equal and the third side is not equal to the two sides.

(2)



9. Internal division $\Rightarrow (x, y) = \left(\frac{x_1 + ky_2}{1+k}, \frac{y_1 + ky_2}{1+k} \right)$

Using x

$$5 = \frac{-14L + 14K}{1+K}$$

$$5L + 5K = 14L + 14K$$

$$9L + 9K = 9K$$

The ratio P divides QR is 1:1

b. External division $\Rightarrow (x, y) \left(\frac{x_1 L - x_2 K}{L + K}, \frac{y_1 L - y_2 K}{L + K} \right)$

Using 4

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

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

$$-24L = 18K$$

$$4L = 3K$$

$$\frac{L}{K} = \frac{3}{4} \quad \therefore \frac{K}{L} = \frac{4}{3}$$

The ratio R divides PQ in 4:3.