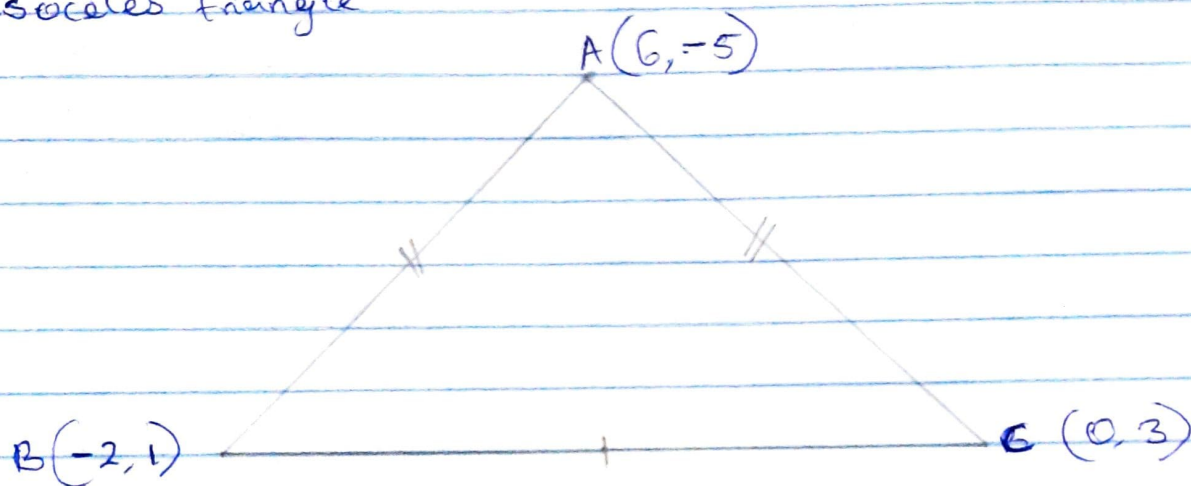


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19/ENG02/028
MAT 102

Assignment

Show that points $A(6, -5)$, $B(-2, 1)$ and $C(0, 3)$ form an isosceles triangle



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

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

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

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

$$= \sqrt{100}$$

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

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

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

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

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

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

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

$$\overline{AB} = \overline{AC}$$

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

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

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

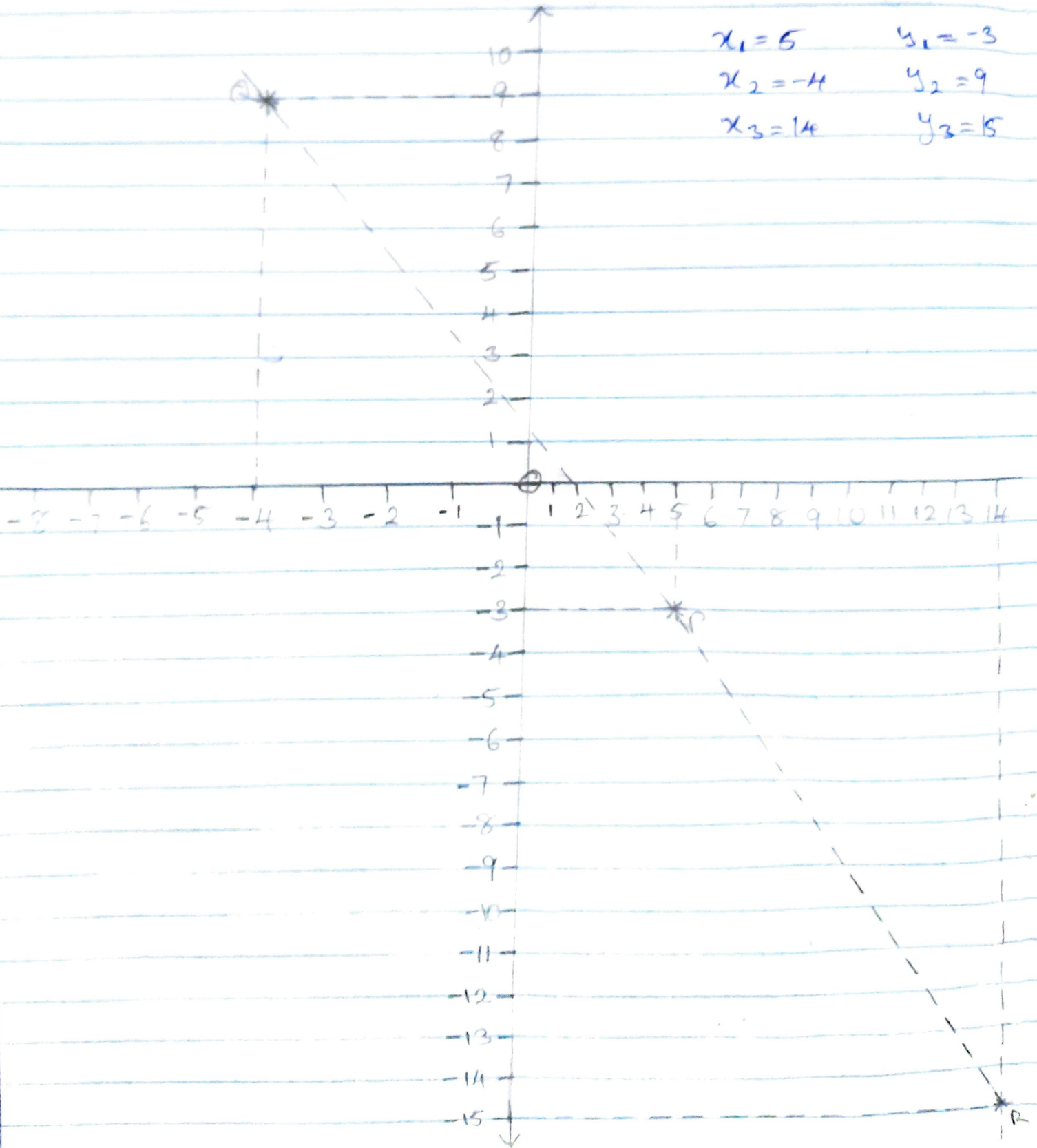
$$= \sqrt{4^2}$$

$$\overline{BC} = 8$$

$$\overline{AB} = \overline{AC} = 10$$

$\therefore \triangle ABC$ is an isosceles triangle.

If P, Q and R are points $(5, -3)$, $(-4, 9)$ and $(14, -15)$ respectively find the ratio in which P divides QR



P divides QR internally

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

$$x_1 = 4$$

$$x_2 = 14$$

$$x = 5$$

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

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

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

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

$$9L = 9K$$

$$L = K$$

∴ The ratio ~~K:L~~ K:L = 1:1

~~Q~~ R divides PQ externally

$$y_1 = -3$$

$$y_2 = 9$$

$$y_3 = -15$$

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

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

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

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

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

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

$$24K = 12L$$

$$2K = L$$

∴ The ratio K:L = 2:1