LINE

11^{th} Maths - EXERCISE-10.4 1

1. What are the points on the y-axis whose distance from the line $\frac{x}{3} + \frac{y}{4} = 1$ is 4 units.

2 **SOLUTION**

Given line equation is

$$\frac{x}{3} + \frac{y}{4} = 1\tag{1}$$

$$\frac{x}{3} + \frac{y}{4} = 1 \tag{1}$$

$$(4x + 3y - 12) = 0 \tag{2}$$

$$\mathbf{n} = \begin{pmatrix} 4\\3 \end{pmatrix} \tag{3}$$

$$c = 12 \tag{4}$$

The distance of the line from y-axis

$$d = \frac{\mathbf{n}^{\top} \mathbf{P} - \mathbf{c}}{|n|} \tag{5}$$

$$\implies \pm 4 = \frac{\left(4 \quad 3\right) \begin{pmatrix} 0\\y \end{pmatrix} - 12}{5} \tag{6}$$

$$\implies \pm 4 = \frac{\binom{0}{3y} - 12}{5} \tag{7}$$

$$\implies \pm 20 = 3y - 12 \tag{8}$$

$$\implies 3y = 20 \pm 12 \tag{9}$$

$$\implies y = \frac{32}{3} \text{ or } y = \frac{-8}{3} \tag{10}$$

3 FIGURE

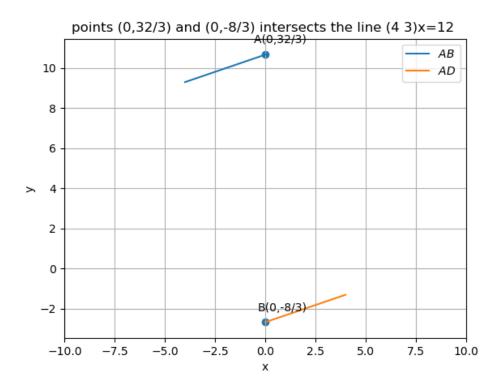


Figure 1: line