LINE

1 11^{th} Maths - EXERCISE-10.4

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

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

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

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

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

The distance of the line from y-axis

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

$$4\pm=\frac{\begin{pmatrix}4 & 3\end{pmatrix}\begin{pmatrix}0\\y\end{pmatrix}-12}{5} \tag{6}$$

$$4\pm=\frac{\begin{pmatrix}0\\3y\end{pmatrix}-12}{5} \tag{7}$$

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

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

$$y=\left(\tfrac{32}{3}\right)\left(\tfrac{-8}{3}\right) \tag{10}$$

Thus, the required points are $\left(0,\ \frac{32}{3}\right)$ and $\left(0,\ \frac{-8}{3}\right)$

3 FIGURE

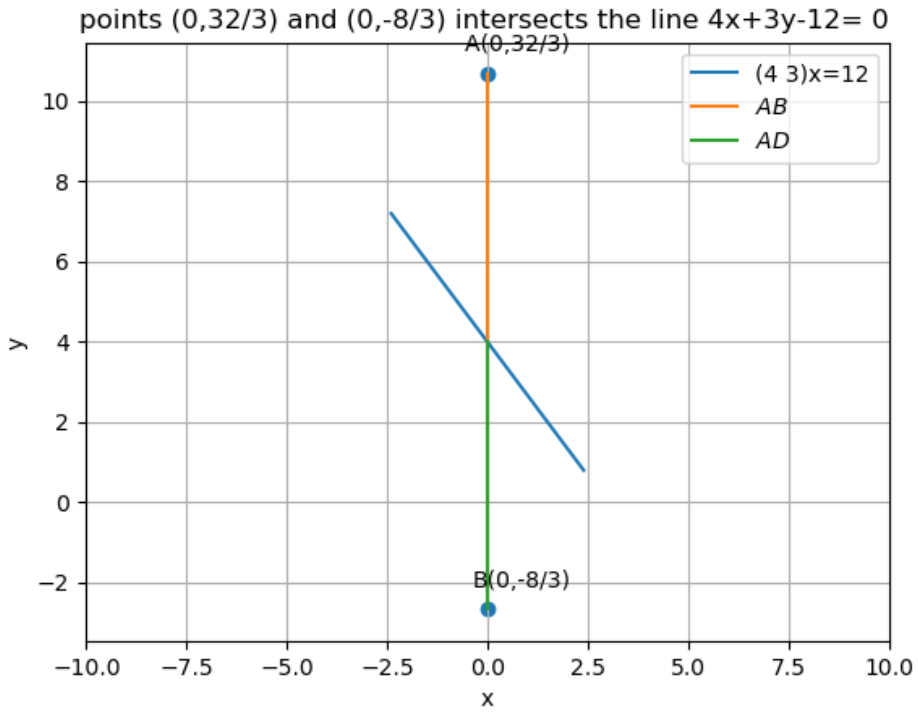

Figure 1: line