

Straight Lines

11th Maths - Chapter 10

This is Problem-3 from Exercise 10.2

1. Find the equation of line passing through $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ with slope m .

Solution: Line passing through point $\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$ is given by,

$$\mathbf{n}^\top (\mathbf{x} - \mathbf{A}) = 0 \quad (1)$$

Where,

$$\mathbf{n} = \begin{pmatrix} 1 \\ \frac{1}{m} \end{pmatrix} \quad (2)$$

$$\mathbf{n}^\top = \left(1 \quad \frac{1}{m}\right) \quad (3)$$

Substituting them in equation (1)

$$\left(1 \quad \frac{1}{m}\right) \left(\mathbf{x} - \begin{pmatrix} 0 \\ 0 \end{pmatrix}\right) = 0 \quad (4)$$

$$\left(1 \quad \frac{1}{m}\right) \begin{pmatrix} x - 0 \\ y - 0 \end{pmatrix} = 0 \quad (5)$$

$$\left(1 \quad \frac{1}{m}\right) \begin{pmatrix} x \\ y \end{pmatrix} = 0 \quad (6)$$

$$x - \frac{y}{m} = 0 \quad (7)$$

$$-\frac{y}{m} = -x \quad (8)$$

$$y = mx \quad (9)$$

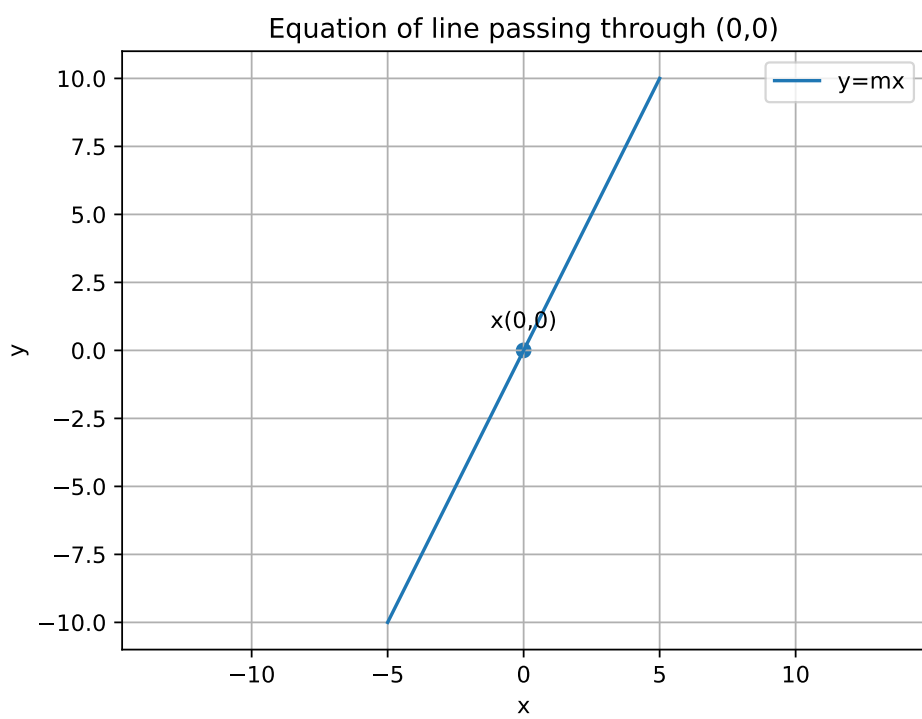


Figure 1