

Equation of Line

1 11th Maths - Chapter 10 From the line equation we find c value is

This is Problem-15 from Exercise 10.3

1. The perpendicular from the origin to the line $y=mx+c$ meets it at the point $(-1,2)$ find value of m and c .

$$\begin{pmatrix} \frac{1}{2} \\ 1 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix} = c \quad (10)$$

$$\begin{pmatrix} \frac{1}{2} & 2 \end{pmatrix} = c \quad (11)$$

$$c = \frac{5}{2} \quad (12)$$

Solution:

Given

$$\mathbf{P} = \begin{pmatrix} -1 \\ 2 \end{pmatrix} \quad (1)$$

$$\mathbf{O} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (2)$$

$$\mathbf{n} = \begin{pmatrix} m \\ -1 \end{pmatrix} \quad (3)$$

The equation of line is

$$\mathbf{n}^\top \mathbf{x} = c \quad (4)$$

$$(m \ -1) \mathbf{x} = c \quad (5)$$

$$(6)$$

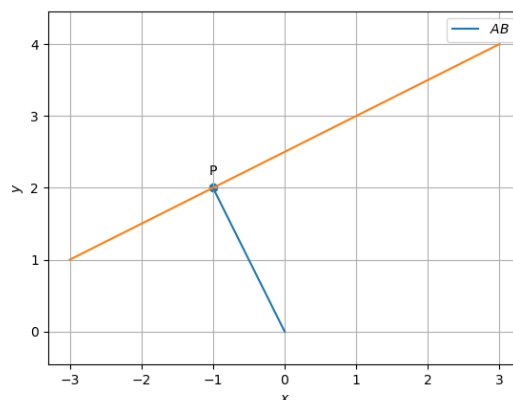


Figure 1

The directional vector \mathbf{OP} is

$$(\mathbf{O} - \mathbf{P})^\top \mathbf{m} = 0 \quad (7)$$

$$\begin{pmatrix} -1 & 2 \end{pmatrix} \begin{pmatrix} -1 \\ -m \end{pmatrix} = 0 \quad (8)$$

$$\mathbf{m} = \frac{1}{2} \quad (9)$$