

Equation of Line

1 11th Maths - Chapter 10

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 .

Solution:

Given

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

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

The directional vector \mathbf{OP} is

$$(\mathbf{O} - \mathbf{P})^\top \mathbf{m} = 0 \quad (3)$$

$$\Rightarrow (1 \quad -2) \begin{pmatrix} 1 \\ m \end{pmatrix} = 0 \quad (4)$$

$$\Rightarrow m = \frac{1}{2} \quad (5)$$

From the line equation

$$\left(\frac{1}{2} \quad 1\right) (\mathbf{x} - \mathbf{P}) = 0 \quad (6)$$

$$\Rightarrow \left(\frac{1}{2} \quad 1\right) \mathbf{x} = \frac{5}{2} \quad (7)$$

$$\Rightarrow c = \frac{5}{2} \quad (8)$$

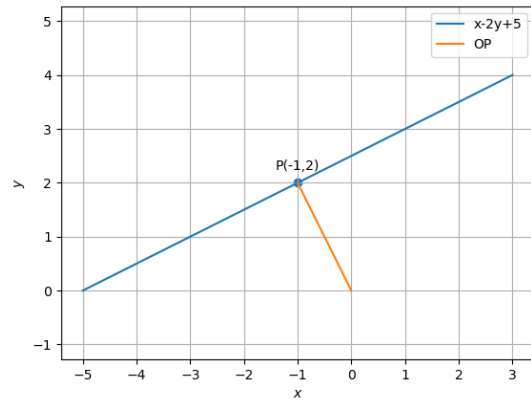


Figure 1