

CLASS-11
CHAPTER-10
STRAIGHT LINES

Exercise 10.4

Q2. Find the values of θ and p , if the equation $x \cos \theta + y \sin \theta = p$ is the normal form of the line $\sqrt{3}x + y + 2 = 0$.

Solution:

From the given line equation normal vector is given by:

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

$$c = -2 \quad (2)$$

Slope of normal form is given by:

$$m = -\sqrt{3} \quad (3)$$

$$\tan \theta = -\frac{1}{m} \quad (4)$$

$$= \frac{1}{\sqrt{3}} \quad (5)$$

$$\implies \theta = 210^\circ \quad (6)$$

The perpendicular distance p is given by:

$$p = \frac{|c|}{\|\mathbf{n}\|} = \frac{2}{2} = 1 \quad (7)$$

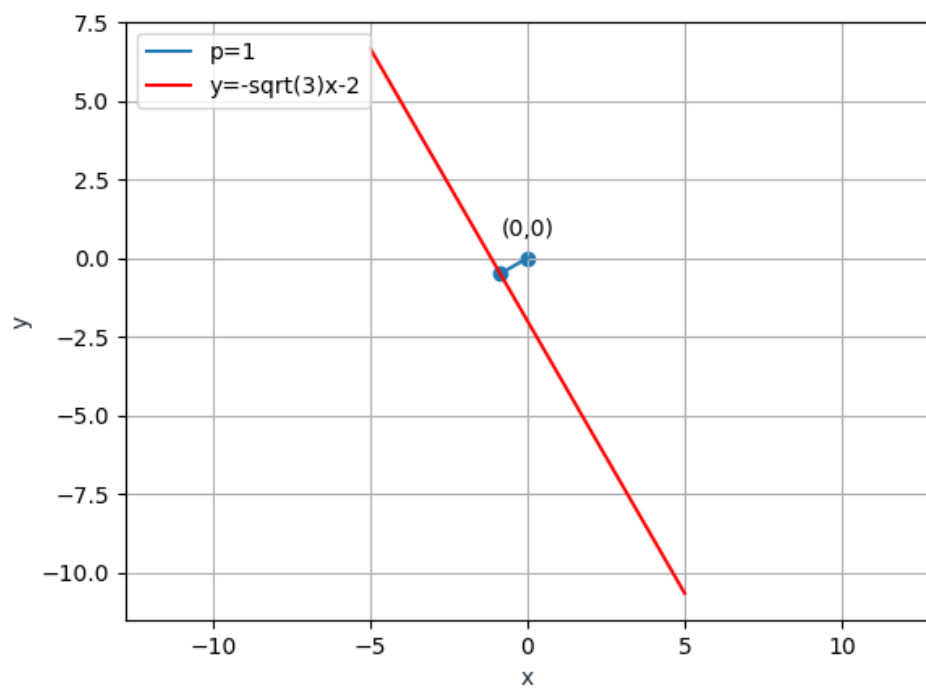


Figure 1: