

LINES

11th Maths - EXERCISE-10.4

Find the equations of the lines, which cutoff intercepts on the axes whose sum and product are 1 and -6 respectively.

Solution: Let the intercepts of x and y are a and b
Given

$$a + b = 1 \quad (1)$$

$$ab = -6 \quad (2)$$

on solving (1) and (2) we get

$$\implies a = 3, b = -2 \text{ or } a = -2, b = 3$$

Thus, the possible intercepts are

$$\begin{pmatrix} 3 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ -2 \end{pmatrix}, \begin{pmatrix} -2 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ 3 \end{pmatrix}$$

$$\mathbf{m} = \mathbf{a} - \mathbf{b} \quad (3)$$

$$= \begin{pmatrix} 3 \\ 0 \end{pmatrix} - \begin{pmatrix} 0 \\ -2 \end{pmatrix} \quad (4)$$

$$= \begin{pmatrix} 3 \\ 2 \end{pmatrix} \quad (5)$$

$$\mathbf{m} = \begin{pmatrix} 3 \\ 2 \end{pmatrix} \text{ or, } \begin{pmatrix} -2 \\ 3 \end{pmatrix} \quad (6)$$

1. For

$$\mathbf{n} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$$

the equation of the line will be

$$\mathbf{n}^T (\mathbf{x} - \mathbf{A}) = 0$$

$$\begin{pmatrix} -2 & 3 \end{pmatrix} \mathbf{x} = 6$$

2. For

$$\mathbf{n} = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$$

the equation of the line will be

$$\mathbf{n}^\top (\mathbf{x} - \mathbf{B}) = 0$$

$$(-3 \quad -2) \mathbf{x} = 6$$

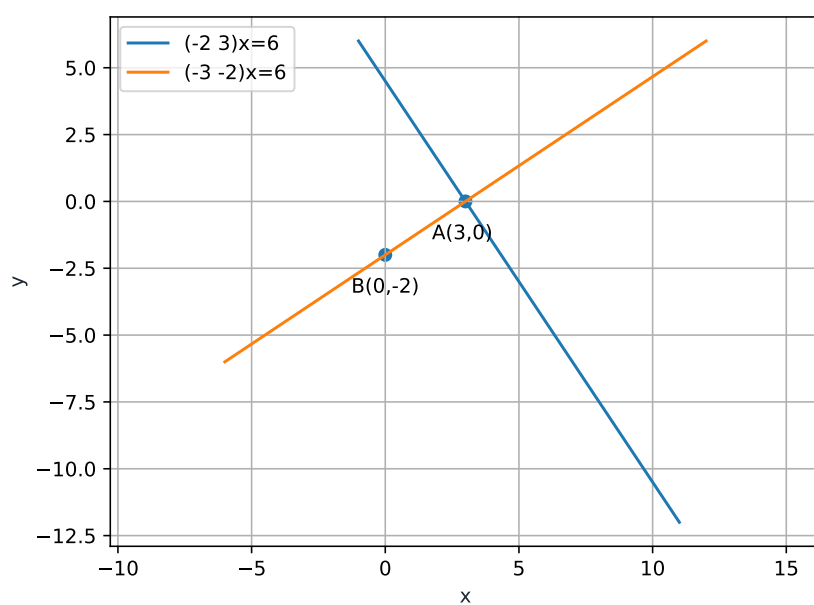


Figure 1