

LINE

1 11th Maths - EXERCISE-10.3

1. The line through the points (h, 3) and (4, 1) intersects the line 7x- 9y- 19= 0 at right angle. Find the value of h.

2 SOLUTION

Given points are

$$\mathbf{A} = \begin{pmatrix} h \\ 3 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 4 \\ 1 \end{pmatrix} \quad (1)$$

$$\mathbf{P} = \mathbf{B} - \mathbf{A} = \begin{pmatrix} 4 \\ 1 \end{pmatrix} - \begin{pmatrix} h \\ 3 \end{pmatrix} \quad (2)$$

$$\mathbf{P} = \begin{pmatrix} 4-h \\ -2 \end{pmatrix} \quad (3)$$

The given line equation is

$$7x - 9y - 19 = 0 \quad (4)$$

$$(7 \quad -9) \mathbf{x} = 19 \quad (5)$$

$$\mathbf{n} = \begin{pmatrix} 7 \\ -9 \end{pmatrix} \quad (6)$$

$$\mathbf{m} = \begin{pmatrix} 9 \\ 7 \end{pmatrix} \quad (7)$$

$$\mathbf{m}^\top \mathbf{P} = 0 \quad (8)$$

$$\Rightarrow (9 \ 7) \begin{pmatrix} 4-h \\ -2 \end{pmatrix} = 0 \quad (9)$$

$$\Rightarrow 36 - 9h - 14 = 0 \quad (10)$$

$$\Rightarrow 36 - 14 = 9h \quad (11)$$

$$\Rightarrow h = \frac{22}{9} \quad (12)$$

3 Figure

points (2.4,3) and (4,1) intersects the line $7x-9y-19=0$ at right angle

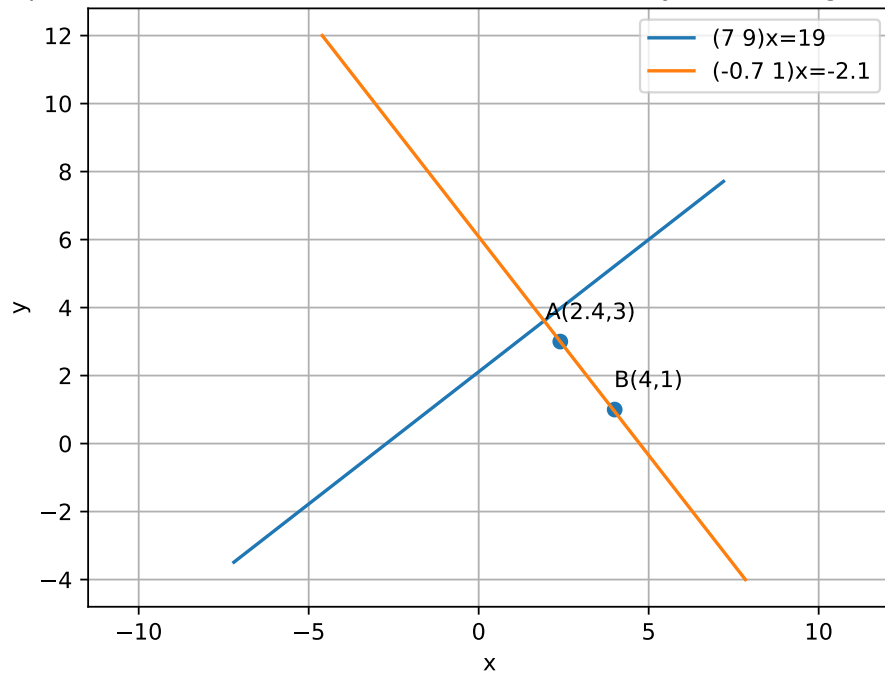


Figure 1: line