

ASSIGNMENT-11.10.4.9

Question : Find the value of p so that the three lines $3x + y - 2 = 0$, $px + 2y - 3 = 0$ and $2x - y - 3 = 0$ may intersect at one point.

Solution :

$$\begin{pmatrix} 3 & 1 & -2 \\ p & 2 & -3 \\ 2 & -1 & -3 \end{pmatrix} \quad (1)$$

$$\xrightarrow[\substack{R'_3=R_3-R_2 \\ R'_2=2R_2-3R_1}]{} \begin{pmatrix} 3 & 1 & -2 \\ 2p-9 & 1 & 0 \\ 2-p & -3 & 0 \end{pmatrix} \quad (2)$$

$$\xrightarrow{R''_3=R_3+3R_2} \begin{pmatrix} 3 & 1 & -2 \\ 2p-9 & 1 & 0 \\ 5p-25 & 0 & 0 \end{pmatrix} \quad (3)$$

$$(4)$$

For getting the determinant zero the last row must be zero .

So,

$$5p - 25 = 0 \quad (5)$$

$$p = 5 \quad (6)$$

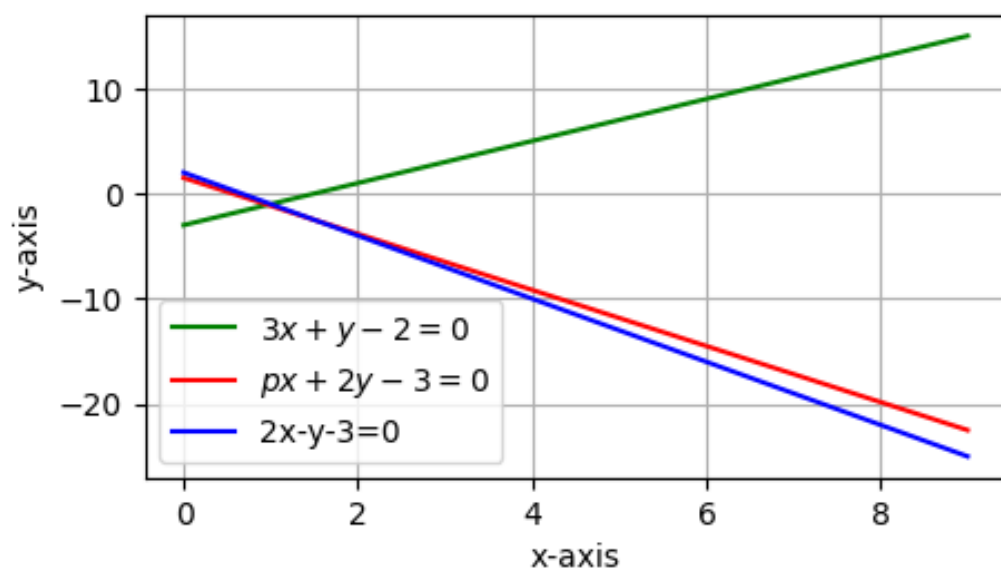


Figure 1: