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 :

$$\begin{pmatrix} 3 & 1 & -2 \\ \mathrm{p} & 2 & -3 \\ 2 & -1 & -3 \end{pmatrix} \tag{1}$$

$$\xrightarrow[R_3'=3R_3-2R_1]{R_2'=3R_2-pR_1} \begin{pmatrix} 3 & 1 & -2 \\ 0 & 6-p & -9+2p \\ 0 & -5 & -5 \end{pmatrix} \tag{2}$$

$$\xrightarrow{R_3''=R_3(6-p)+5R_2} \begin{pmatrix} 3 & 1 & -2 \\ 0 & 6-p & -9+2p \\ 0 & 0 & -75+15p \end{pmatrix} \tag{3}$$

$$\implies -75 + 15p = 0 \tag{4}$$

$$p = 5 \tag{5}$$

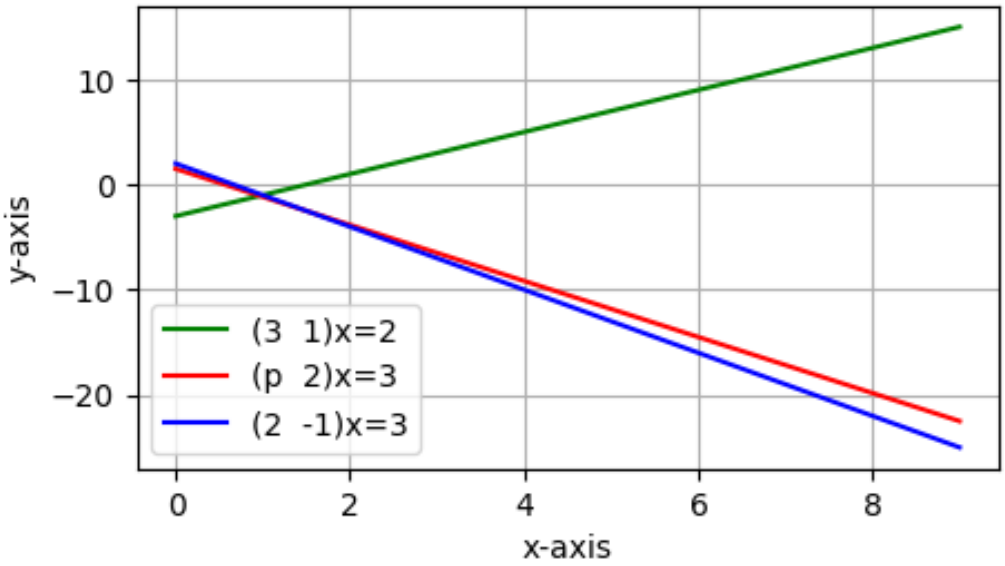

Figure 1: