1-1.6-3

EE24BTECH11050 - Pothuri Rahul

Question:
Determine if the points $(1,5)$, $(2,3)$ and $(-2,-11)$ are collinear.
Solution:

point	Vector
A	$\begin{pmatrix}1\\5\end{pmatrix}$
B	$\begin{pmatrix}2\\3\end{pmatrix}$
C	$\begin{pmatrix}-2\\-11\end{pmatrix}$

TABLE 0: Variables Used

The matrix

$$\begin{pmatrix} B-A & C-A \end{pmatrix}^{\top} = \begin{pmatrix} 1 & -4 \\ -2 & -14 \end{pmatrix} \tag{0.1}$$

$$\xleftrightarrow{R_2=R_2+2R_1} \begin{pmatrix} 1 & -4 \\ 0 & -22 \end{pmatrix} \tag{0.2}$$

$\therefore$ The rank of matrix is 2. It implies the given points are non collinear.

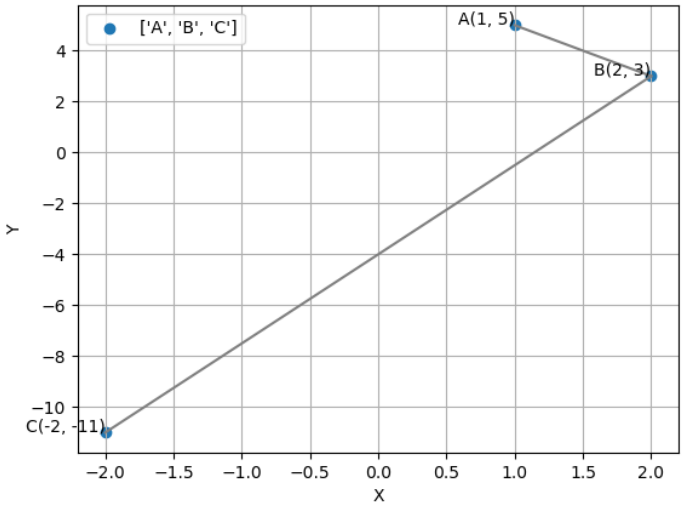

Fig. 0.1: Scatter plot of points A, B, and C