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

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

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

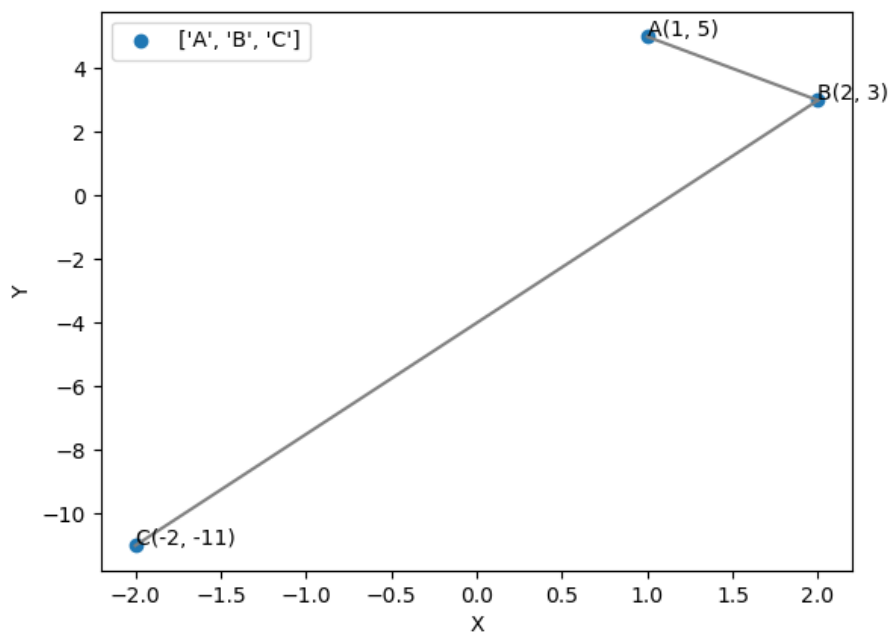$\therefore$ The rank of matrix is 2. It implies the given points ae non collinear.

Fig. 0.1: Plot of A,B,C