1.1.5.23

EE24BTECH11024 - G. Abhimanyu Koushik

Question:

Show that the points $\begin{pmatrix}-2\\3\\5\end{pmatrix}$, $\begin{pmatrix}1\\2\\3\end{pmatrix}$ and $\begin{pmatrix}7\\0\\-1\end{pmatrix}$ are collinear.

Solution: The Collinearity matrix is given by

Name	Point
$\begin{pmatrix}-2\\3\\5\end{pmatrix}$	Point A
$\begin{pmatrix}1\\2\\3\end{pmatrix}$	Point B
$\begin{pmatrix}7\\0\\-1\end{pmatrix}$	Point C

TABLE 0: Variables Used

$$\begin{pmatrix}\mathbf{B}-\mathbf{A} & \mathbf{C}-\mathbf{A}\end{pmatrix}^{T} = \begin{pmatrix}3 & -1 & -2\\9 & -3 & -6\end{pmatrix} \tag{0.1}$$

$$\xleftrightarrow{R_2 \leftarrow R_1 - 3R_2} \begin{pmatrix}3 & -1 & -2\\0 & 0 & 0\end{pmatrix} \tag{0.2}$$

Since the rank of the Collinearity matrix is 1, the points are collinear

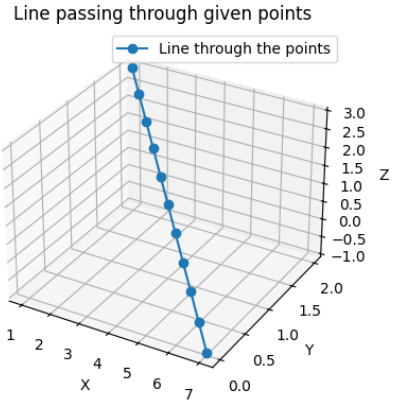

Fig. 0.1: Line through the given points