1.1.5.23

EE24BTECH11024 - G. Abhimanyu Koushik

Question:
Show that the points $\mathbf{A}\left(-2\hat{i}+3\hat{j}+5\hat{k}\right)$, $\mathbf{B}\left(\hat{i}+2\hat{j}+3\hat{k}\right)$ and $\mathbf{C}\left(7\hat{i}-\hat{k}\right)$ are collinear.
Solution: The Collinearity matrix is given by

Name	Point
$(-2,3,5)$	Point A
$(1,2,3)$	Point B
$(7,0,-1)$	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

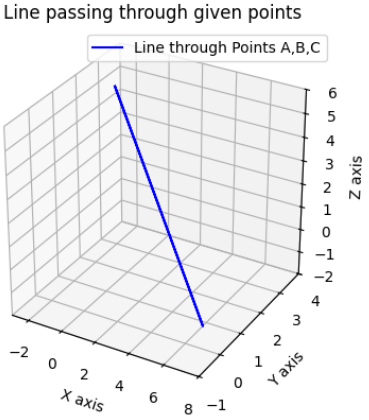

Fig. 0.1: Line through the given points