

# 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

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

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

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

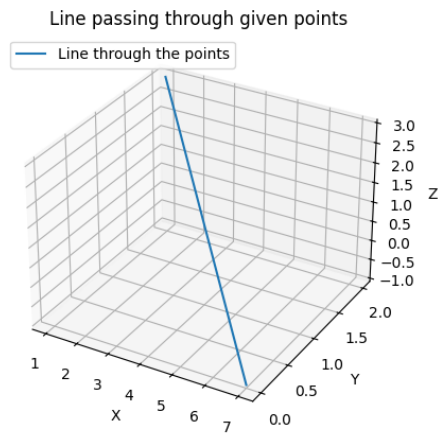


Fig. 0.1: Line through the given points