

1.1.5.23

EE24BTECH11024 - G. Abhimanyu Koushik

Question:

Show that the points $\mathbf{A}(-2\hat{i} + 3\hat{j} + 5\hat{k})$, $\mathbf{B}(\hat{i} + 2\hat{j} + 3\hat{k})$ and $\mathbf{C}(7\hat{i} - \hat{k})$ are collinear.

Solution: The Collinearity matrix is given by

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

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

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

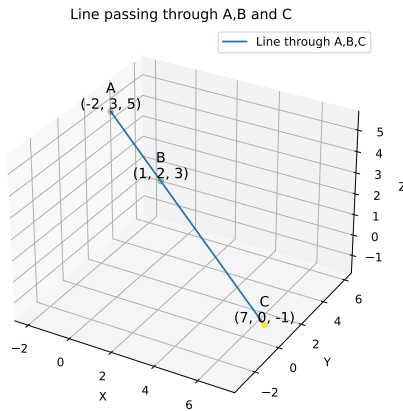


Fig. 0.1: Line through the given points