

# 1-1.7-8

EE24BTECH11058 - P.Shiny Diavajna

**Question:** Using vectors, prove that the points  $(2, -1, 3)$ ,  $(3, -5, 1)$  and  $(-1, 11, 9)$  are collinear.

**Solution:**

Variable	Description
$\begin{pmatrix} 2 & -1 & 3 \end{pmatrix}$	Point <b>A</b>
$\begin{pmatrix} 3 & -5 & 1 \end{pmatrix}$	Point <b>B</b>
$\begin{pmatrix} -1 & 11 & 9 \end{pmatrix}$	Point <b>C</b>

TABLE 0: Variables Used

$$\begin{aligned} (B - A \quad C - A)^T &= \begin{pmatrix} 1 & -4 & -2 \\ -3 & 12 & 6 \end{pmatrix} \\ &\xrightarrow{R_2 = R_2 + 3R_1} \begin{pmatrix} 1 & -4 & -2 \\ 0 & 0 & 0 \end{pmatrix} \end{aligned}$$

rank = number of non-zero rows  
i.e. rank = 1

therefore,

**A, B, C** are collinear.

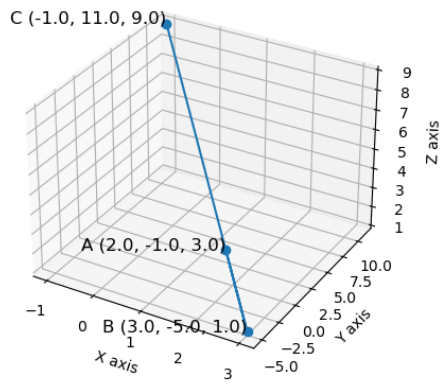


Fig. 0.1: Plot of points A,B and C