

1.6.23

EE24BTECH11001 - Aditya Tripathy

Question:

Are **A** (3, 1), **B** (6, 4) and **C** (8, 6) collinear?

Solution:

From (1.1.9.1), Points A, B, C are defined to be collinear if

$$\text{rank}(\mathbf{B} - \mathbf{A} \quad \mathbf{C} - \mathbf{A}) = 1 \quad (0.1)$$

$$(0.2)$$

So, forming the collinearity matrix and doing row operations,

$$\begin{pmatrix} 3 & 3 \\ 5 & 5 \end{pmatrix} \xrightarrow{R_2=3R_2-5R_1} \begin{pmatrix} 3 & 3 \\ 0 & 0 \end{pmatrix} \quad (0.3)$$

$$(0.4)$$

Since there is only 1 non-zero row, rank = 1. Hence the points **A**, **B** and **C** are collinear.

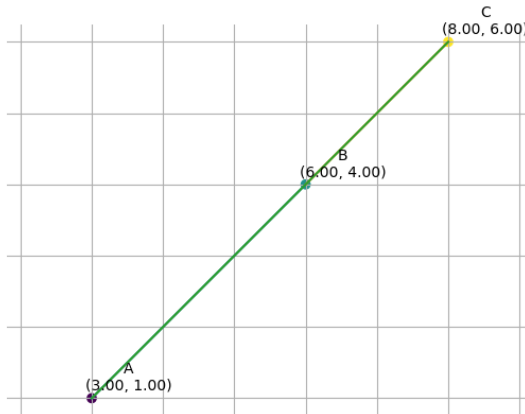


Fig. 0.1: Line joining **A**, **B** and **C**