1.1.6-21

EE24BTECH11028 - Jadhav Rajesh

Question: Show that points A$(a, b+c)$, B$(b, c+a)$, C$(c, a+b)$ are collinear.
Solution: : We know that points,A,B,C are collinear,if

$$rank\begin{pmatrix} B-A \\ C-a \end{pmatrix}^{T} = 1 \tag{0.1}$$

$$rank\begin{pmatrix} b-a & a-b \\ c-a & a-c \end{pmatrix}^{T} = 1 \tag{0.2}$$

$$\begin{pmatrix} b-a & c-a \\ a-b & a-c \end{pmatrix} \tag{0.3}$$

$$R_2 \to R_2 - R_1 \tag{0.4}$$

$$\begin{pmatrix} b-a & c-a \\ 0 & 0 \end{pmatrix} \tag{0.5}$$

Thus,the rank of matrix is 1 and the points are collinear.

Define the coordinates of points A, B, and C.

$$a, b.c = 1, 2, 3 \tag{0.6}$$

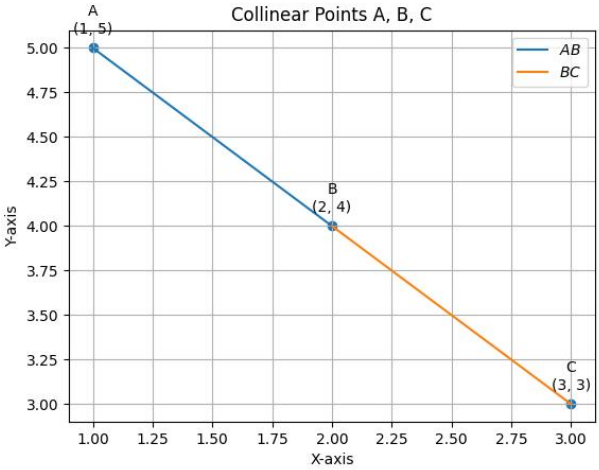

Fig. 0.1: Plot of points **A**, **B** and **P**