

1-1.6-11

EE24BTECH11005 - Arjun Pavanje

Question:

If the points **A** (1, 2), **O** (0, 0) and **B** (a, b) are collinear, then find the relation between a and b .

Solution:

Variable	Description
A	Point (1, 2)
O	(0, 0) point
B	(a, b) point

TABLE I: Variables Used

First we should construct the collinearity matrix with the given points A,O,B

$$\begin{pmatrix} O - A \\ B - O \end{pmatrix} \quad (1)$$

$$\begin{pmatrix} -1 & -2 \\ a & b \end{pmatrix} \xleftrightarrow{R_2 \rightarrow R_2 - aR_1} \begin{pmatrix} -1 & -2 \\ 0 & b - 2a \end{pmatrix} \quad (2)$$

rank should be 1 for collinearity, for that R_2 must be 0, so

$$b - 2a = 0 \quad (3)$$

$$\therefore b = 2a \quad (4)$$

The required relation between a , and b is, $b = 2a$

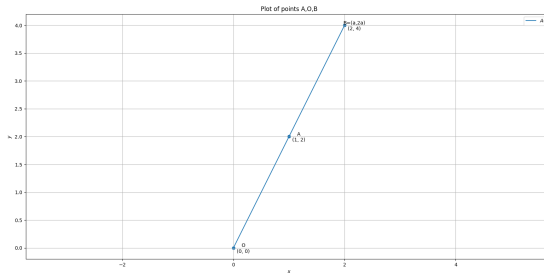


Fig. 1: Plot of the points A,O,B