ASSIGNMENT 1

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Download all python codes from

https://github.com/Vallidevibolla/vallidevi/blob/main/Collinear.py

and latex-tikz codes from

https://github.com/Vallidevibolla/vallidevi/blob/main/no.tex

1 Question No.14

Find the value of k,if the points $\begin{pmatrix} k \\ 3 \end{pmatrix}$, $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$ and $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$ are collinear.

2 Solution

Let

$$\mathbf{A} = \begin{pmatrix} k \\ 3 \end{pmatrix} \tag{2.0.1}$$

$$\mathbf{B} = \begin{pmatrix} 6 \\ -2 \end{pmatrix} \tag{2.0.2}$$

$$\mathbf{C} = \begin{pmatrix} -3 \\ 4 \end{pmatrix} \tag{2.0.3}$$

As,given that the points are collinear,

$$[(A-B) \qquad (B-C)]^T \tag{2.0.4}$$

$$\begin{pmatrix} k-6 & 3-(-2) \\ 6-(-3) & -2-4 \end{pmatrix}$$

$$\rightarrow \begin{pmatrix} k-6 & 5 \\ 9 & -6 \end{pmatrix} \xleftrightarrow{(R_2 \rightarrow R_1)} \begin{pmatrix} 9 & -6 \\ k-6 & 5 \end{pmatrix}$$

$$\xrightarrow{(R_1 \rightarrow R_1/3)} \begin{pmatrix} 3 & -2 \\ k-6 & 5 \end{pmatrix}$$

$$\longrightarrow \begin{pmatrix} 3 & -2 \\ 0 & 3\times 5-(-2\times(k-6)) \end{pmatrix}$$

$$\implies 15+2K-12=0$$

$$\implies k=-3/2$$

$\therefore$ Finally the value of k is $\frac{-3}{2}$

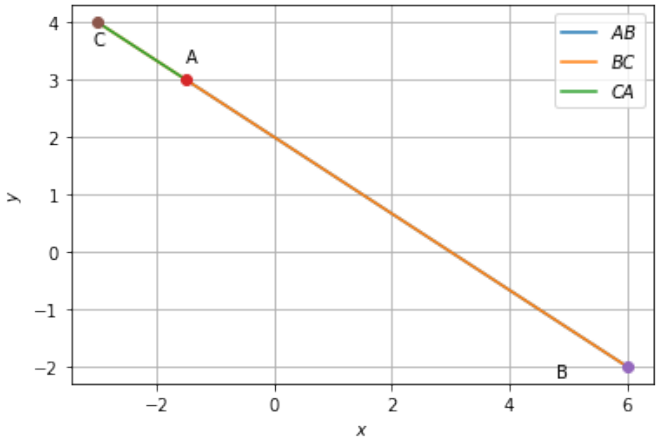

Fig. 0: collinear