Assignment 3

P VENKATA PRANEETH

Find Python Codes from below link

https://github.com/praneeth2720/IIT–H/blob/main/assignment–3/question14.py

and latex codes from

https://github.com/praneeth2720/IIT–H/blob/main/assignment–3/question14.tex

1 CBSE 10^{th} 2008 PAPER.

1.1 Question 14

Find the value of k if the points (k, 3), (6, -2) and (-3, 4) are collinear.

1.2 Solution

LetP, Q and R are the given points

P=$\begin{pmatrix} K \\ 3 \end{pmatrix}$ Q=$\begin{pmatrix} 6 \\ -2 \end{pmatrix}$ R=$\begin{pmatrix} -3 \\ 4 \end{pmatrix}$

And if the three points are collinear then the area of triangle formed by these points will be zero

By using area of triangle formula

$$\frac{1}{2}\begin{pmatrix} k & 3 & 1 \\ 6 & -2 & 1 \\ -3 & 4 & 1 \end{pmatrix} = 0 \tag{1.2.1}$$

$$R_2 \Leftrightarrow R_2 - R_3 \tag{1.2.2}$$

$$\begin{pmatrix} k & 3 & 1 \\ 9 & -6 & 0 \\ -3 & 4 & 1 \end{pmatrix} = 0 \tag{1.2.3}$$

$$R_1 \Leftrightarrow R_1 - R_3 \tag{1.2.4}$$

$$\begin{pmatrix} k+3 & -1 & 0 \\ 9 & -6 & 0 \\ -3 & 4 & 1 \end{pmatrix} = 0 \tag{1.2.5}$$

(1.2.6)

$$\implies -6k - 18 + 9 = 0$$

-6k=9

k = $\frac{-3}{2}$

$\therefore$the point P is $\begin{pmatrix} \frac{-3}{2} \\ 3 \end{pmatrix}$

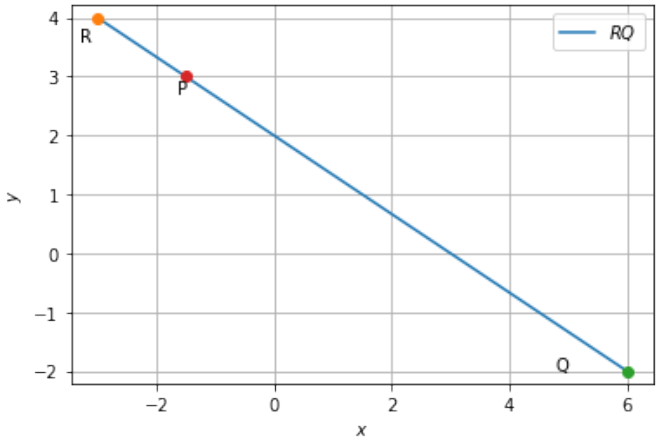

Figure.1:three collinear points