1.4.9.d

EE24BTECH11025 - GEEDI HARSHA

Question: Given that $\mathbf{P}(3,2,-4)$, $\mathbf{Q}(5,4,-6)$ and $\mathbf{R}(9,8,-10)$ are collinear. Find the ratio in which Q divides PR.

Variable	Description
k	ratio in which point divides a line segment
$\mathbf{P}\,(3,2,-4)$	coordinates of point P
$\mathbf{Q}\,(5,4,-6)$	coordinates of point Q
$\mathbf{R}\,(9,8,-10)$	coordinates of point R
k	ratio in which Q divides **PR**

TABLE 0: Input Parameters

Solution: As Q lies between P and R, P can be represented as

$$Q = \frac{kR + P}{k+1} \tag{0.1}$$

where k is the ratio,

$$Q = \frac{k\begin{pmatrix}9\\8\\-10\end{pmatrix} + \begin{pmatrix}3\\2\\-4\end{pmatrix}}{k+1} \tag{0.2}$$

$$Q = \frac{\begin{pmatrix}9k+3\\8k+2\\-10k-4\end{pmatrix}}{k+1} \tag{0.3}$$

$$Q = \begin{pmatrix}5\\4\\-6\end{pmatrix} \tag{0.4}$$

on equating both sides

$$k = \frac{1}{2} \tag{0.5}$$

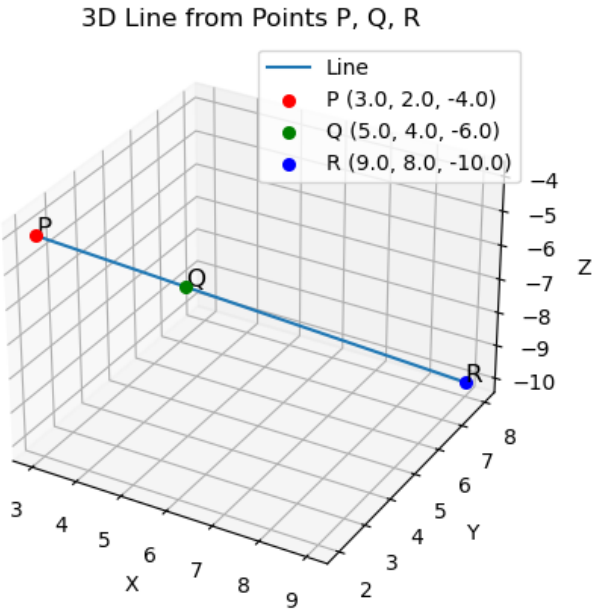

Fig. 0.1: The Plot of the given points