EE24BTECH11007 - Arnav Makarand Yadnopavit

Question:

Find the coordinates of the points which trisect the line segment joining the points P(4, 2, -6) and Q(10, -16, 6).

Solution: Given

Point	Coordinates
P	(4, 2, -6)
Q	(10, -16, 6)

TABLE 0: Given Values

Let **R** and **S** trisect **P** and **Q** Using Section Formula

$$\mathbf{R} = \frac{1}{\frac{1}{2} + 1} \left(\frac{1}{2} \begin{pmatrix} 4 \\ 2 \\ -6 \end{pmatrix} + \begin{pmatrix} 10 \\ -16 \\ 6 \end{pmatrix} \right) \tag{0.1}$$

$$\mathbf{R} = \begin{pmatrix} 8 \\ -10 \\ 2 \end{pmatrix} \tag{0.2}$$

$$\mathbf{S} = \frac{1}{\frac{2}{1} + 1} \left(\frac{2}{1} \begin{pmatrix} 4\\2\\-6 \end{pmatrix} + \begin{pmatrix} 10\\-16\\6 \end{pmatrix} \right) \tag{0.3}$$

$$\mathbf{S} = \begin{pmatrix} 6 \\ -4 \\ -2 \end{pmatrix} \tag{0.4}$$

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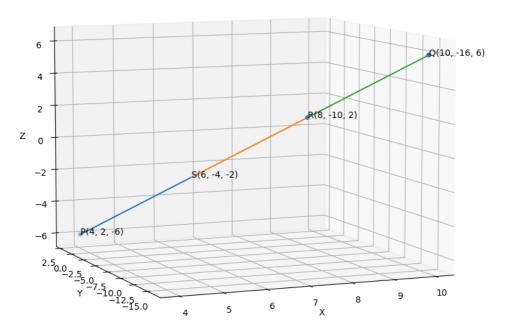


Fig. 0.1: Plot of **P**,**Q**,**R**,**S**