1.4.9.h

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: From Table **??**

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

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

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

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

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

Thus coordinates of **R** and **S** are $(8, -10, 6)$ and $(6, -4, -2)$

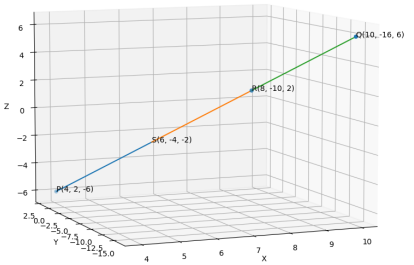

Fig. 0.1: Plot of **P**,**Q**,**R**,**S**