

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 0

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

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

$$\mathbf{R} = \begin{pmatrix} 8 \\ -10 \\ 2 \end{pmatrix} \quad (0.2)$$

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

$$\mathbf{S} = \begin{pmatrix} 6 \\ -4 \\ -2 \end{pmatrix} \quad (0.4)$$

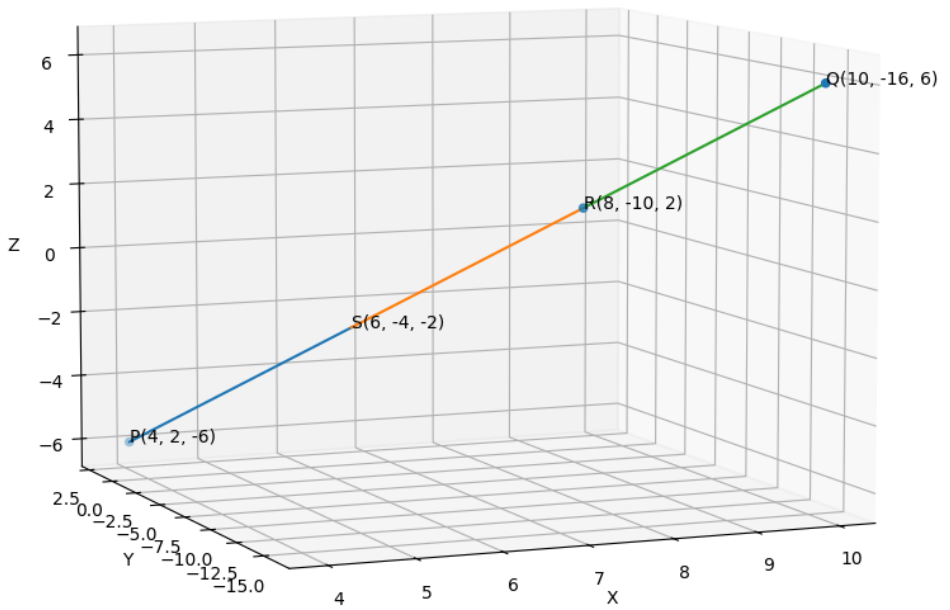


Fig. 0.1: Plot of **P,Q,R,S**