4.4.13

AI25BTECH11017-BALU

Question:
A line passes through the point with position vector

$$2\hat{i} - \hat{j} + 4\hat{k} \tag{0.1}$$

and is in the direction of the vector

$$\hat{i} + \hat{j} - 2\hat{k}. \tag{0.2}$$

Find the equation of the line.
Solution:
Let us solve the given equation theoretically and then verify the solution computationally
According to the question,
Given

$$\mathbf{P} = \begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix} \quad \mathbf{D} = \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} \tag{0.3}$$

The equation of line is

$$\mathbf{r} = \begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} \tag{0.4}$$