4.6.3

EE25BTECH11015 - Bhoomika V

Question :- Find the equation of the line which passes through the point $(-2, 4, -5)$ and is parallel to the line

$$\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}.$$

Solution:

Let the equation of line passing through the given point be

$$\mathbf{x} = \begin{pmatrix} -2 \\ 4 \\ -5 \end{pmatrix} + \mu\mathbf{d}$$

where $\mathbf{d}$ is the direction vector of the line.

The direction vector of the line

$$\mathbf{x} = \begin{pmatrix} -3 \\ 4 \\ -8 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ 5 \\ 6 \end{pmatrix}$$

is

$$\mathbf{d} = \begin{pmatrix} 3 \\ 5 \\ 6 \end{pmatrix}. \tag{1}$$

Thus, the required equation of the line is

$$\mathbf{x} = \begin{pmatrix} -2 \\ 4 \\ -5 \end{pmatrix} + \mu \begin{pmatrix} 3 \\ 5 \\ 6 \end{pmatrix}.$$

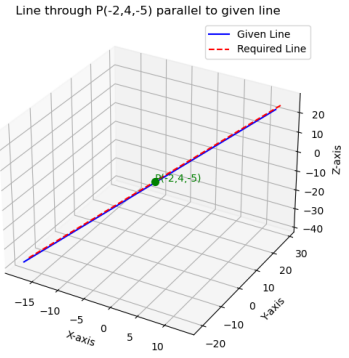
Line through P(-2,4,-5) parallel to given line
Given Line
Required Line
P(-2,4,-5)
X-axis
Y-axis
Z-axis

Fig. 0.1