9.5.3

AI24BTECH11024-Pappuri Prahladha

Question:
The cartesian equation of a line AB is $\frac{2x-1}{12} = \frac{y+2}{2} = \frac{z-3}{3}$.Find the direction cosines of a line parallel to line AB.
Solution:

Term	Description
m	Direction vector of line

TABLE 1: Terms used

The direction vector of the given line is:

$$\mathbf{m} = \begin{pmatrix} 6 \\ 2 \\ 3 \end{pmatrix}$$

The unit vector of a line having direction vector m is given by :

$$\frac{m}{\|m\|} \tag{0.1}$$

The direction cosines are elements of above vector
From 0.1 the unit vector along AB is:

$$\frac{1}{\sqrt{49}} \begin{pmatrix} 6 \\ 2 \\ 3 \end{pmatrix} \tag{0.2}$$

$\therefore$ the direction cosines of line parallel to lineAB are the elements of above vector.

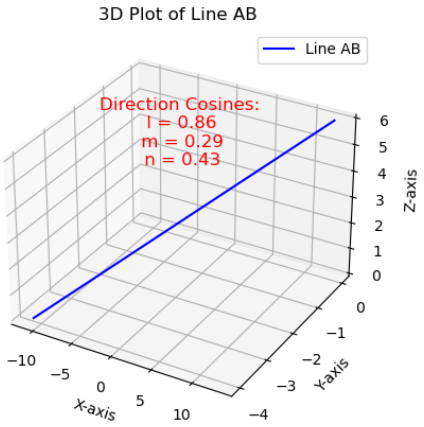

Fig. 0.1: Plot showing the line AB