

1.11.16

AI24BTECH11001 - Abhijeet Kumar

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 :

$$= \frac{m}{\|m\|} \quad (0.1)$$

The direction cosines are elements of above vector

From 0.1 the unit vector along AB is:

$$= \frac{1}{\sqrt{49}} \begin{pmatrix} 6 \\ 2 \\ 3 \end{pmatrix} \quad (0.2)$$

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

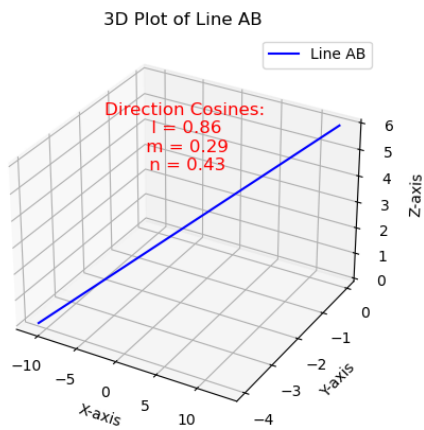


Fig. 0.1: Plot showing the line AB