

Three Dimensional Geometry

12th Maths - Chapter 11

This is Problem-3 from Exercise 11.1

1. If a line has the direction ratios $-18, 12, -4$, then what are its direction cosines ?

Solution: let \mathbf{A} be the given vector

$$\mathbf{A} = \begin{pmatrix} -18 \\ 12 \\ -4 \end{pmatrix} \quad (1)$$

Then \mathbf{B} be the unit vector in the direction of \mathbf{A} then directions cosines is given by

$$\mathbf{B} = \frac{\mathbf{A}}{\|\mathbf{A}\|} \quad (2)$$

The magnitude for \mathbf{A} is

$$\|\mathbf{A}\| = 22 \quad (3)$$

Then direction cosines are

$$\mathbf{B} = \begin{pmatrix} \frac{-9}{11} \\ \frac{6}{11} \\ \frac{-2}{11} \end{pmatrix} \quad (4)$$