Three Dimensional Geometry

12^{th} 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

   $$\mathbf{A} = \begin{pmatrix} -18 \\ 12 \\ -4 \end{pmatrix} \tag{1}$$

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

   $$\mathbf{B} = \frac{\mathbf{A}}{\|\mathbf{A}\|} \tag{2}$$

   The magnitude for $\mathbf{A}$ is

   $$\|\mathbf{A}\| = 22 \tag{3}$$

   Then direction cosine vector $\mathbf{B}$ is

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