

12.11.1.2

Lokesh Surana

CLASS 12, CHAPTER 11, EXERCISE 1.2

- 2) Find the direction cosines of a line which makes equal angles with the coordinate axes.

Solution: Suppose the line cosines are given by

$$\mathbf{x} = \begin{pmatrix} \cos \alpha \\ \cos \alpha \\ \cos \alpha \end{pmatrix} \quad (1)$$

As per the property of direction cosines, we have

$$\|\mathbf{x}\| = \sqrt{\cos^2 \alpha + \cos^2 \alpha + \cos^2 \alpha} = 1 \quad (2)$$

$$\sqrt{3} \times (\cos \alpha)^2 = 1 \quad (3)$$

$$\cos \alpha = \pm \frac{1}{\sqrt{3}} \quad (4)$$