# Equation of Unit Vector

## 1 $12^{th}$ Maths - Chapter 10

**This is Problem-5 from Exercise 5.5**

1. Find the value of x for which $x(\hat{i}+\hat{j}+\hat{k})$ is a unit vector

## 2 Solution

unit vector is

$$\mathbf{a} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \tag{1}$$

$$\overrightarrow{a} = \frac{1}{\|\mathbf{a}\|}\mathbf{a} \tag{2}$$

$$\|\mathbf{a}\| = \sqrt{\begin{pmatrix} 1 & 1 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}} \tag{3}$$

$$= \sqrt{3} \tag{4}$$

$$\overrightarrow{a} = \frac{1}{\sqrt{3}}\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \tag{5}$$

$$= \begin{pmatrix} \frac{1}{\sqrt{3}} \\ \frac{1}{\sqrt{3}} \\ \frac{1}{\sqrt{3}} \end{pmatrix} \tag{6}$$