Assignment 2: 1.10.18

EE25BTECH11055 - Subhodeep Chakraborty

Question:
Write the direction ratios of the vector $\mathbf{a} = \hat{\imath} + \hat{\jmath} - \hat{k}$ and hence calculate its direction cosines.
Solution:
Given vector:

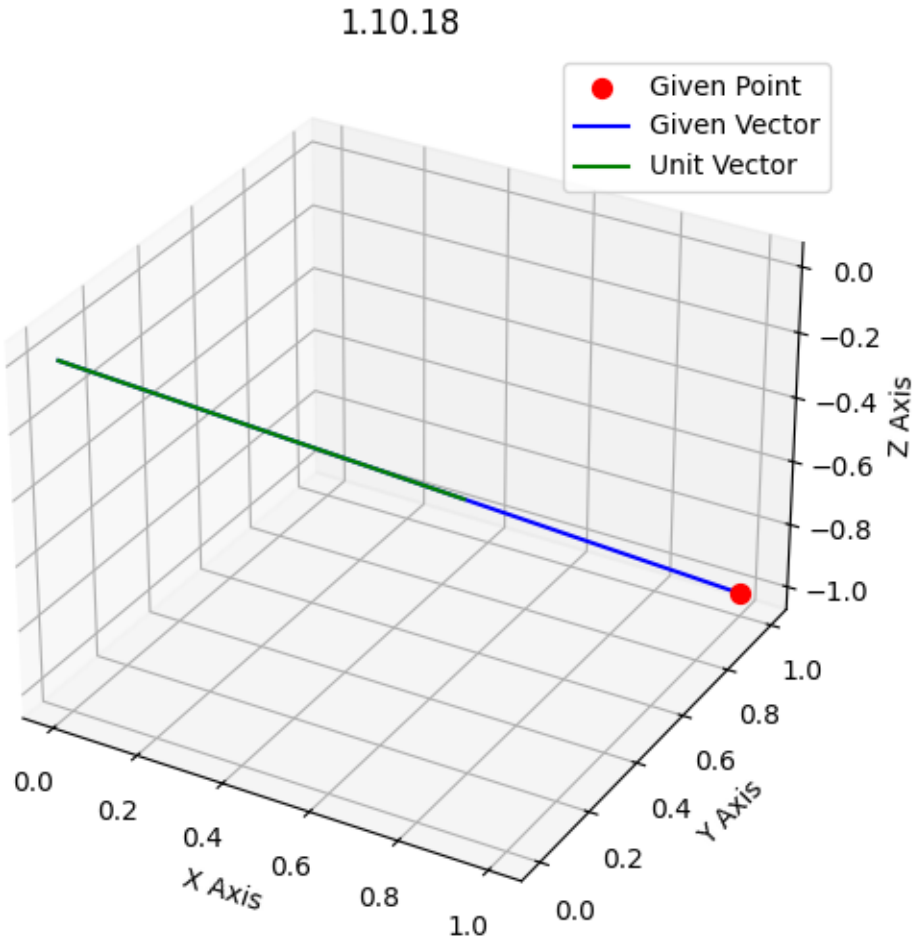
$$\mathbf{a} = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix} \tag{1}$$

$\therefore$ The direction ratios are 1, 1 and -1.
Now,

$$\|\mathbf{a}\| = \sqrt{3}$$

$$\implies \frac{\mathbf{a}}{\|\mathbf{a}\|} = \begin{pmatrix} \frac{1}{\sqrt{3}} \\ \frac{1}{\sqrt{3}} \\ \frac{-1}{\sqrt{3}} \end{pmatrix}$$

Thus we see that the direction cosines are $1/\sqrt{3}$, $1/\sqrt{3}$ and $-1/\sqrt{3}$.


1.10.18
Given Point
Given Vector
Unit Vector
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Z Axis
0.0
0.2
0.4
0.6
0.8
1.0
X Axis
0.0
0.2
0.4
0.6
0.8
1.0
Y Axis