

Assignment 1

Tanay Yadav - AI20BTECH11026

Download the latex-tikz codes from:

https://github.com/tanayyadav28/EE3900-Assignments/blob/main/Assignment%201/Assignment_1.tex

1 PROBLEM

[Vectors Q2; Q23]

Find a unit vector in the direction of $(a) + (b)$ where,

$$(a) = \begin{bmatrix} 2 \\ 2 \\ -5 \end{bmatrix}, (b) = \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix} \quad (1.0.1)$$

2 SOLUTION

Let (c) be the vector $(a) + (b)$

$$(c) = (a) + (b) \quad (2.0.1)$$

$$\therefore (c) = \begin{bmatrix} 4 \\ 3 \\ -2 \end{bmatrix} \quad (2.0.2)$$

Now,

$$\|(c)\| = \sqrt{(4)^2 + (3)^2 + (-2)^2} \quad (2.0.3)$$

$$\therefore \|(c)\| = \sqrt{29} \quad (2.0.4)$$

Let (h) be the unit vector in the direction of (c) .

$$(h) = \frac{(c)}{\|(c)\|} \quad (2.0.5)$$

$$\therefore (h) = \frac{1}{\sqrt{29}} \begin{bmatrix} 4 \\ 3 \\ -2 \end{bmatrix} \quad (2.0.6)$$

Hence, (h) is the required unit vector.