ASSIGNMENT 1

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Download all python codes from

https://github.com/Ananthoju−Pranav−Sai/EE3900/blob/main/Assignment−1/codes/Assignment−1.py

and latex-tikz codes from

https://github.com/Ananthoju−Pranav−Sai/EE3900/tree/main/Assignment−1/Assignment−1.tex

1 Vectors 2.4

Find the direction vectors of the sides of a triangle with vertices

$$\mathbf{A} = \begin{pmatrix} 3 \\ 5 \\ -4 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -5 \\ -5 \\ -2 \end{pmatrix} \tag{1.0.1}$$

2 Solution

Given,

$$\mathbf{A} = \begin{pmatrix} 3 \\ 5 \\ -4 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -5 \\ -5 \\ -2 \end{pmatrix} \tag{2.0.1}$$

Direction vector of side AB is

$$\mathbf{AB} = \mathbf{B} - \mathbf{A} \tag{2.0.2}$$

$$\mathbf{AB} = \begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix} - \begin{pmatrix} 3 \\ 5 \\ -4 \end{pmatrix} \tag{2.0.3}$$

$$\mathbf{AB} = \begin{pmatrix} -4 \\ -4 \\ 6 \end{pmatrix} \tag{2.0.4}$$

Direction vector of side BC is

$$\mathbf{BC} = \mathbf{C} - \mathbf{B} \tag{2.0.5}$$

$$\mathbf{BC} = \begin{pmatrix} -5 \\ -5 \\ -2 \end{pmatrix} - \begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix} \tag{2.0.6}$$

$$\mathbf{BC} = \begin{pmatrix} -4 \\ -6 \\ -4 \end{pmatrix} \tag{2.0.7}$$

Direction vector of side CA is

$$\mathbf{CA} = \mathbf{A} - \mathbf{C} \tag{2.0.8}$$

$$\mathbf{CA} = \begin{pmatrix} 3 \\ 5 \\ -4 \end{pmatrix} - \begin{pmatrix} -5 \\ -5 \\ -2 \end{pmatrix} \tag{2.0.9}$$

$$\mathbf{CA} = \begin{pmatrix} 8 \\ 10 \\ -2 \end{pmatrix} \tag{2.0.10}$$

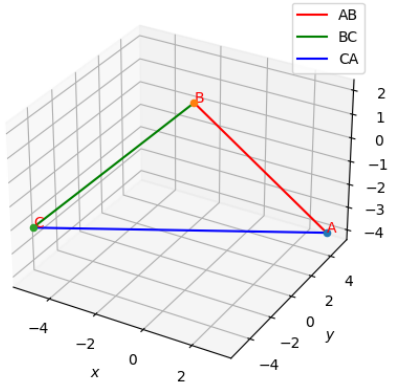

Fig. 0: Plot of the triangle