

Assignment 1

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Abstract—This document explains the concept of unit vector by solving a problem.

Download all python codes from

<https://github.com/Adarsh1310/EE5609/tree/master/codes>

and latex-tikz codes from

<https://github.com/Adarsh1310/EE5609>

1 PROBLEM

Find the value of x for which $x \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$ is a unit vector.

2 EXPLANATION

A unit vector is a vector which has a magnitude equal to 1.

1 Multiply the scalar value with the given vector.

$$x \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} x \\ x \\ x \end{pmatrix}$$

2 Calculate the magnitude of the resultant vector. Magnitude of vector should be 1.

$$\|\mathbf{x}\| = 1$$

$$\sqrt{3x^2} = 1$$

3 SOLUTION

Solving the equation:

$$\sqrt{3x^2} = 1$$

The solution comes to be $x = 1/\sqrt{3}$ and $-1/\sqrt{3}$