

Assignment 3

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Determinant

Abstract—This document contains the solution to find the value of given Determinant.

Download all python codes from

https://github.com/shivangi-975/EE5609-Matrix_Theory/tree/master/Assignment3/Codes

Download latex-tikz codes from

https://github.com/shivangi-975/EE5609-Matrix_Theory/blob/master/Assignment3/Assignment3.tex

1 PROBLEM

Evaluate the following: $\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} = 0$

2 SOLUTION

Given determinant: $\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} = 0$

Applying transformation:

$$\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} \xrightarrow{C3 \leftarrow C3 - C2} \begin{vmatrix} x & a & x \\ y & b & y \\ z & c & z \end{vmatrix} \quad (2.0.1)$$

$$\begin{vmatrix} x & a & x \\ y & b & y \\ z & c & z \end{vmatrix} \xrightarrow{C3 \leftarrow C3 - C1} \begin{vmatrix} x & a & 0 \\ y & b & 0 \\ z & c & 0 \end{vmatrix} \quad (2.0.2)$$

From 2.0.2 If any row or column of determinant is zero, then its value is zero

$$\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} = \begin{vmatrix} x & a & 0 \\ y & b & 0 \\ z & c & 0 \end{vmatrix} = 0 \quad (2.0.3)$$