Assignment 3

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1 QUESTION

(Section 3.10) 9. Show that $\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} = 0$

2 EXPLANATION

Apply Transformations:

$$\begin{vmatrix} x & a & x+a \\ y & b & y+b \\ z & c & z+c \end{vmatrix} \tag{2.0.1}$$

$$\xrightarrow{C_3 \leftarrow C_3 - C_2} \begin{vmatrix} x & a & x \\ y & b & y \\ z & c & z \end{vmatrix} \tag{2.0.2}$$

If any two rows or two columns are same then the determinant of matrix is 0.

In (2.0.2), we observe that the 1st and 3rd columns are equal.

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