

1. Using properties of determinants ,

prove that
$$\begin{vmatrix} a + b + nc & na - a & nb - b \\ nc - c & b + c + na & nb - b \\ nc - c & na - a & c + a + nb \end{vmatrix} = n(a + b + c)^3. \quad [4]$$

2. If $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$, find A^{-1} and use it to solve the system of equations.

$$x + 2y + z = 4, \quad -x + y + z = 0, \quad x - 3y + z = 2. \quad [4]$$

3. Using Matrices , solve the following system of homogeneous equations.

$$2x - 3y - z = 0, \quad x + 3y - 2z = 0, \quad x - 3y = 0. \quad [4]$$

4. Show that the relation R in the set $A = \{x \in W, 0 \leq x \leq 17\}$ given by

$$R = \{(a, b) : |a - b| \text{ is a multiple of } 5\} \text{ where } a, b \text{ belongs to } A, \text{ is an equivalence relation.} \quad [4]$$

5. Find the Domain and Range of the function $(x) = \frac{1}{\sqrt{4-x^2}}$. [4]