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Class – 12th **Chapter-5** **Subject Maths**

Worksheet-24 Inverse of a Matrix and Linear Equations

1. Solve the equations using matrix method:

   (i) $2x - y = -2$, $3x + 4y = 3$ (ii) $5x + 7y + 2 = 0$, $4x + 6y + 3 = 0$

2. If $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ then find A^{-1} and solve the system of equations:

   $x - 2y = 10, \quad 2x + y + 3z = 8, \quad -2y + z = 7.$

3. Find the product of matrices $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$ and $\begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & 2 \\ 2 & 1 & 3 \end{bmatrix}$ and solve

   the system of equations using the above product $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$

4. Find the inverse of the matrix $\begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$ and with the help of this solve the

   system of equations $\begin{bmatrix} 1 & 0 & 1 \\ 2 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \frac{1}{2}\begin{bmatrix} 2y \\ 6z \\ -2x \end{bmatrix} + 2\begin{bmatrix} 2 \\ 0 \\ 1 \end{bmatrix}$

5. If the side of an equilateral triangle is a and vertices are (x_1, y_1), (x_2, y_2) and (x_3, y_3) then prove that $\begin{vmatrix} x_1 & y_1 & 2 \\ x_2 & y_2 & 2 \\ x_3 & y_3 & 2 \end{vmatrix}^2 = 3a^4$