

ST. VIVEKANAND PUBLIC SCHOOL, SADABAD
SUB - MATHEMATICS
STD. - XII

ASSIGNMENT

1. If $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$, Find A^{-1} and hence solve system of equation

$$x+2y-3z = -4, 2x+3y+2z = 2, 3x-3y-4z = 11$$

2. If $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$ Find AB & hence solve

$$x-y = 3, 2x+3y+4z = 17, y+2z = 7.$$

3. Check the consistency and inconsistency of the following linear equations.

i) $3x - y + 2z = 3$

ii) $2x + y - 2z = 4$

$$2x + y + 3z = 5$$

$$x - 2y + z = -2$$

$$x - 2y - z = 1$$

$$5x - 5y + z = -2$$

iii) $3x + y = 5$

iv) $x + y - z = 0$

$$-6x - 2y = 9$$

$$x - 2y + z = 0$$

$$3x + 6y - 5z = 0$$

4. Determine the product $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & 1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and use it to solve the system of equations. $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$

5. Find the area of triangle using the determinants if three of its vertices are $(5,2)$, $(-3,-1)$, $(6,0)$.

6. If the points (a, b) , (c, d) , and $(a+c, b+d)$ are collinear, show that $ad = bc$.

7. Find the value of α so that the points $(1,-5)$, $(-4,5)$, and $(\alpha,7)$ are collinear.

8. If $a, b,$ & c are distinct real no. and the system of equations

$$ax + a^2y + (a^3+1)z = 0$$

$$bx + b^2y + (b^3+1)z = 0$$

$$cx + c^2y + (c^3+1)z = 0 \text{ has a non trivial solution show that } abc = -1.$$

9. Find the minor of element 5, $\begin{vmatrix} -3 & 6 & 5 \\ 2 & 1 & 0 \\ -1 & 6 & 5 \end{vmatrix}$

10. Find the co-factor of element a_{23} , $\begin{vmatrix} -8 & 6 & 0 \\ 6 & 1 & 0 \\ -1 & 6 & 5 \end{vmatrix}$

11. Using the co-factor of the second row of determinant

$$\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} \text{ find the value of } \Delta.$$

12. Find A^{-1} where $\begin{bmatrix} 6 & 4 & 2 \\ -12 & 15 & 18 \\ 25 & -20 & 15 \end{bmatrix}$ and solve the following

$$6x - 12y + 25z = 4$$

$$4x + 15y - 20z = 3$$

$$2x + 18y + 15z = 10$$

Find A^{-1} where $\begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$ and solve the following

$$3x + 4y + 7z = 14$$

$$2x - y + 3z = 4$$

$$x + 2y - 3z = 0$$

14. solve the following system of equations using matrices:

$$\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$$

$$\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$$

$$\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2 \quad x, y, z \neq 0.$$

15. Find the value of α , for which the homogeneous system of equation:

$$2x + 3y - 2z = 0$$

$$2x - y + 3z = 0$$

$$7x + \alpha y - z = 0 \quad \text{has non trivial solutions. Find the solutions.}$$