System of Linear Equation & Matrices

1. Solve the following system of equation by matrix method
$x-2y-4=0$
$-3x+5y+7=0$ [CBSE '93] Ans: x=-6, y=-5

2. Solve the following system of equation by matrix method
$$5x+3y+z=16$$
$$2x+y+3z=19$$
$$x+2y+4z=25$$
[CBSE '85 '02] Ans: x=1, y=2, z=5

3. Solve the following system of equation by matrix method
$$x+y+z=3$$
$$x-2y+3z=2$$
$$2x-y+z=2$$
[CBSE '06] Ans: x=1, y=1, z=1

4. Solve the following system of equation by matrix method
$$\frac{2}{x}+\frac{3}{y}+\frac{10}{z}=4$$
$$\frac{4}{x}+\frac{6}{y}+\frac{5}{z}=1$$
$$\frac{6}{x}+\frac{9}{y}+\frac{20}{z}=2$$
[CBSE '85 '02] Ans: x=2, y=3, z=5

5. Solve the following system of equation by matrix method
$$5x+3y+z=16$$
$$2x+y+3z=19$$
$$x+2y+4z=25$$
[CBSE '85 '02] Ans: x=1, y=2, z=5

6. Show that the following system of equation is consistent:
$$x-y+z=3$$
$$2x+y-z=2$$
$$-x-2y+2z=1$$

7. If $A=\begin{bmatrix}2 & -3 & 5\\ 3 & 2 & -4\\ 1 & 1 & -2\end{bmatrix}$, find A^{-1}. Use it to solve the following system of equations:
$$2x-3y+5z=16$$
$$3x+2y-4z=-4$$
$$x+y-2z=-3$$
Ans: x=2, y=1, z=3 [CBSE '05]

8. Let $A=\begin{bmatrix}1 & -1 & 1\\ 2 & 1 & -3\\ 1 & 1 & 1\end{bmatrix}$ and $B=\begin{bmatrix}4 & 2 & 2\\ -5 & 0 & \alpha\\ 1 & -2 & 3\end{bmatrix}$. If B is the inverse of matrix A, then find α.

9. A system of three equations is given by
$$x+\alpha y=0$$
$$y+\alpha x=0$$
$$z+\alpha x=0$$
. Find the value of α for which the system of equation has infinitely many solutions. Ans: -1

10. If $A=\begin{bmatrix}\alpha & 0\\ 1 & 1\end{bmatrix}$ and $B=\begin{bmatrix}1 & 0\\ 5 & 1\end{bmatrix}$, whenever $A^2=B$, then find the value of α.

Ans: no real value of α.

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