

1. Calculate  $2A$ , where

$$A = \begin{bmatrix} 2 & 1 \\ 6 & 5 \end{bmatrix}$$

2. Find  $AB$  and  $BA$ ,

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

3. Find  $AB$ ,  $BA$ ,  $A + B$ ,  $A - B$ ,  $4A$ ,  $6B$

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 4 & 6 \\ 7 & 2 & 5 \end{bmatrix}$$

4. Check that  $XY = YX$  or not, where

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad Y = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

5. Show that the equations  $X I_2 = X$  and  $I_2 X = X$ , where

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

6. Show that the equation  $OX = O$  and  $XO = O$ , where

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad O = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$$

7. Show that  $X(Y+Z) = XY + XZ$ , where

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad Y = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}, \quad Z = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$$

8. Show that  $(XY)Z = X(YZ)$ , where

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad Y = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}, \quad Z = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$$

9. Find Inverse of matrix  $A$  and prove that  $AA^{-1} = A^{-1}A = I_2$ , where

$$A = \begin{bmatrix} 5 & 2 \\ -7 & -3 \end{bmatrix}$$

10. Find inverse of matrix  $B$  and prove that  $BB^{-1} = B^{-1}B = I_2$

$$B = \begin{bmatrix} -3 & 1 \\ 5 & -2 \end{bmatrix}$$

11. Find inverse of matrix C and prove that  $CC^{-1} = C^{-1}C = I_2$

$$C = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

12. Find inverse of matrix D and prove that  $DI_2 = I_2D = D$

$$D = \begin{bmatrix} 4 & 2 \\ 2 & 1 \end{bmatrix}$$

13. Find inverse of matrix E and prove that  $EI_2 = I_2E = E$

$$E = \begin{bmatrix} 1 & -1 \\ 3 & 4 \end{bmatrix}$$

14. Prove that X & Y are inverse of each other, where

$$X = \begin{bmatrix} 1 & 5 \\ -3 & -6 \end{bmatrix} \quad Y = \begin{bmatrix} -\frac{2}{3} & \frac{1}{3} \\ -\frac{5}{9} & \frac{1}{9} \end{bmatrix}$$

15. Prove that X & Y are inverse of each other, where

$$A = \begin{bmatrix} -8 & 3 \\ 5 & -1 \end{bmatrix} \quad B = \begin{bmatrix} \frac{1}{7} & \frac{3}{7} \\ \frac{5}{7} & \frac{8}{7} \end{bmatrix}$$

16. Prove that X & Y are inverse of each other, where

$$A = \begin{bmatrix} -3 & -4 \\ -6 & -5 \end{bmatrix} \quad B = \begin{bmatrix} \frac{5}{9} & -\frac{4}{9} \\ -\frac{2}{3} & \frac{1}{3} \end{bmatrix}$$

17. Find inverse of matrix X, where

$$X = \begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$$

18. Find inverse of matrix X, where

$$X = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 2 \\ 1 & 2 & 3 \end{bmatrix}$$

19. Find inverse of matrix Y, where

$$Y = \begin{bmatrix} 2 & 3 & 0 \\ 1 & -2 & -0 \\ 2 & 0 & -1 \end{bmatrix}$$

20. Find inverse of matrix R, where

$$R = \begin{bmatrix} 2 & 1 & 2 \\ 3 & 2 & 1 \\ 2 & 1 & 1 \end{bmatrix}$$

21. Find inverse of matrix A, where

$$A = \begin{bmatrix} 2 & 0 & 2 \\ 0 & 4 & 2 \\ 2 & 2 & 2 \end{bmatrix}$$

22. Find inverse of matrix U, where

$$U = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 3 & 4 \\ 1 & 4 & 3 \end{bmatrix}$$

23. Find inverse of matrix V, where

$$V = \begin{bmatrix} 2 & 4 & 6 \\ 0 & 4 & 6 \\ 0 & 0 & 3 \end{bmatrix}$$

24. Solve the given equations using matrix inverse method

(1)  $3x + 8y = 5$ ,  $4x + 11y = 7$

(2)  $5x + 15y + 56z = 35$ ,  $-4x - 11y - 41z = -26$ ,  $-x - 3y - 11z = -7$

(3)  $2x - 17y + 11z = 0$ ,  $-x + 11y - 7z = 8$ ,  $3y - 2z = -2$

(4)  $2x + 3y + z = 32$ ,  $3x + 3y + z = -27$ ,  $2x + 4y + 1 = -2$

(5)  $x + 2y = 4$ ,  $3x - 5y = 1$

(6)  $5x + y = 13$ ,  $3x + 2y = 5$

(7)  $3x + 2y = -2$ ,  $x + 4y = 6$