

CLASS – XII

1. If $A = \begin{bmatrix} 3 & -2 \\ 4 & 2 \end{bmatrix}$ find K in $A^2 = KA + 2I$.
2. Find x & y in $\begin{bmatrix} x + 3 & 4 \\ y - 4 & x + y \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ 3 & 9 \end{bmatrix}$
3. If $A = [1 \ 2 \ 3]$ find AA' .
4. Find the number of possible matrices of 2×2 with each entry 1 or 2.
5. Write a square matrix which is both symmetry and skew symmetry.
6. If $A(\text{adj } A) = \begin{bmatrix} -2 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -2 \end{bmatrix}$. Find $|A|$
7. If $B = \begin{bmatrix} 1 & -5 \\ 0 & -3 \end{bmatrix}$ and $A + 2B = \begin{bmatrix} 0 & 4 \\ -7 & 5 \end{bmatrix}$ Find A.
8. If $A = [1 \ 4 \ 4]$ and $B = \begin{bmatrix} 2 \\ 5 \\ 6 \end{bmatrix}$ find AB .
9. Simplify $\sin \theta \begin{bmatrix} \sin \theta & -\cos \theta \\ \cos \theta & \sin \theta \end{bmatrix} + \cos \theta \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix} - \text{diag}(-1, 1)$?
10. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$. Prove that $A^3 - 4A^2 + A = 0$
11. Find x If $[1 \times 1] \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 3 & 2 & 3 \end{bmatrix} \begin{bmatrix} 1 \\ -2 \\ 3 \end{bmatrix} = []$
12. Express as sum of symm and skew symm
 - i) $\begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ 4 & 6 & 5 \end{bmatrix}$
 - (ii) $\begin{bmatrix} 6 & 2 \\ 8 & 9 \end{bmatrix}$
13. If $\begin{bmatrix} \cos 2\pi/5 & -\sin 2\pi/5 \\ \sin 2\pi/5 & \cos 2\pi/5 \end{bmatrix}^k = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. Find least positive value of K.
14. $A = \begin{bmatrix} 1 & 3 & 4 \\ -2 & 5 & 7 \end{bmatrix}$ and $2A - 3B = \begin{bmatrix} 4 & 5 & -4 \\ 1 & 2 & 3 \end{bmatrix}$. Find B.
15. find x+y from the following

$$2 \begin{bmatrix} x & 5 \\ 7 & y - 3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$
16. Simplify

$$\tan \theta \begin{bmatrix} \sec \theta & \tan \theta \\ \tan \theta & -\sec \theta \end{bmatrix} + \sec \theta \begin{bmatrix} -\tan \theta & -\sec \theta \\ -\sec \theta & \tan \theta \end{bmatrix}$$

17. If $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ find $3A - B$?

18. If $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ then A^6 is equal to _____

19. If A, B are symmetric matrix. Prove that $AB+BA$ is symm. and $AB-BA$ is skew Symm.

20. Prove that sum of diagonal elements & skew symm. always zero.

21. Verify that $(AB)'=B'A'$. For $A = \begin{bmatrix} 1 \\ -4 \\ 3 \end{bmatrix}$, $B = [-1 \ 2 \ 1]$

22. If $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -4 \end{bmatrix}$ find A^{-1} . Using A^{-1} solve the following equation
 $2x - 3y + 5z = 16, \quad 3x + 2y - 4z = -4, \quad x + y - 2z = -3$

23. Solve the system of following
 $2/x + 3/y + 10/z = 4, \quad 4/x - 6/y + 5/z = 1$
 $6/x + 9/y - 20/z = 2$

24. $A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 3 & -3 \\ 0 & 1 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$. Verify that $BA = 6I$, use the result to solve the equation
 $x - y = 3 \quad 2x + 3y + 4z = 17$
 $y + 2z = 7$

25. Use the product
 $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the equation $x + 3z = 90,$
 $-x + 2y - 2z = 4 \quad 2x - 3y + 4z = -3$

26. Determine the Product

$$\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -6 \\ 2 & 1 & 3 \end{bmatrix} \text{ and solve the equation}$$

$$x - y + z = 4$$

$$x - 2y - 2z = 9$$

$$2x + y + 3z = 1$$

27. If $A = \begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 6 \\ 3 & 2 \end{bmatrix}$. Verify that $(AB)^{-1} = B^{-1}A^{-1}$

28. If $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$ find A^{-1} , use it to solve the system of equation.

$$2x - 3y + 5z = 11$$

$$3x + 2y - 4z = -5$$

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

29. A is invertible matrix of 3x3 and $|A|=9$, find $|A^{-1}|$

30. For what k, $\begin{bmatrix} k & 2 \\ 3 & 4 \end{bmatrix}$ has no inverse.

31. Given a square matrix 3x3 such that $|A|=12$. find $|\text{adj}(\text{adj}(A))|$

32. If A is a square matrix of 3x3 such that $A(\text{adj}(A)) = 10I$ then find $|\text{adj}A.A|$

33. If A is skew symmetric matrix of 3x3 then find $|A|$.

34. If $A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ find $|A.\text{adj}(A)|$

35. If A and B are invertible matrix of same order. Given $|(AB)^{-1}|=8$, $|A|=3/4$ find $|B|$

LOYAL EDUCATION MATHEMATICS

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(DAILY PRACTICE PAPER)

[MATRICES]

36. If $A \begin{bmatrix} k & 10 \\ 7 & k-3 \end{bmatrix}$ is a Singular matrix find k.

37. Find A^{-1} of $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$

38. If A is 3x3 matrix then what will be the value of k if $\det(A^{-1}) = (\det A)^k$

39. If $|A|=3$ and $A^{-1} \begin{bmatrix} 3 & -1 \\ -5/3 & 1/3 \end{bmatrix}$ find $\text{adj}(A)$.

40. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ be such that $A^{-1} = KA$ find k.

41. If $A \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ 0 & 0 \\ 2 & 3 \end{bmatrix}$ find A^{-1}

42. If $A^{-1} = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ find (AB^{-1}) .

43. If A and B are invertible matrix such that $|(AB)^{-1}| = 8$ and $|A| = 2$ then find $|B|$

44. If $A = \begin{bmatrix} 2x & 0 \\ x & x \end{bmatrix}$, $A^{-1} = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$. Find x
