

ALGEBRA OF MATRICES & DETERMINANTS

Assignment 4 Practice by O.P. GUPTA • M. +91-9650350480

Q01. If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, then A^2 equals

(a) $\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$

(b) $\begin{bmatrix} 2 & -2 \\ -2 & -2 \end{bmatrix}$

(c) $\begin{bmatrix} -2 & -2 \\ -2 & 2 \end{bmatrix}$

(d) $\begin{bmatrix} -2 & 2 \\ 2 & -2 \end{bmatrix}$

Q02. $\begin{vmatrix} 43 & 44 & 45 \\ 44 & 45 & 46 \\ 45 & 46 & 47 \end{vmatrix}$ equals

(a) 0

(b) -1

(c) 1

(d) 2

Q03. A square matrix A is said to be singular if _____.

Q04. If $A = \begin{bmatrix} 3 & -5 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 17 \\ 0 & -10 \end{bmatrix}$, then $|AB| =$ _____.

Q05. If $\begin{bmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{bmatrix}$ is symmetric matrix, then find the value of x.

Q06. If A is a square matrix such that $A^2 = A$, then find $(2+A)^3 - 19A$.

Q07. If A is a square matrix of order 3 such that $A(\text{adj.}A) = \begin{bmatrix} -2 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -2 \end{bmatrix}$, then find $|A|$.

Q08. Find the order of the matrix A such that $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$.

Q09. If $B = \begin{bmatrix} 1 & -5 \\ 0 & -3 \end{bmatrix}$ and $A + 2B = \begin{bmatrix} 0 & 4 \\ -7 & 5 \end{bmatrix}$, find the matrix A.

Q10. If $A = \begin{bmatrix} 1 & 0 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 \\ 5 \\ 6 \end{bmatrix}$, find AB.

Q11. If the matrix $A = \begin{bmatrix} 0 & 6-5x \\ x^2 & x+3 \end{bmatrix}$ is symmetric, find the value of x.

Q12. For the matrix $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$, verify that

(i) $(A + A')$ is a symmetric matrix.

(ii) $(A - A')$ is a skew-symmetric matrix.

Q13. Find the equation of the line joining A(1, 3) and B(0, 0), using determinants. Also, find k if D(k, 0) is a point such that the area of $\triangle ABD$ is 3 square units.

Q14. If $A = \begin{bmatrix} 3 & 4 & 2 \\ 0 & 2 & -3 \\ 1 & -2 & 6 \end{bmatrix}$, find A^{-1} .

Hence, solve the following system of equations :

$$3x + 4y + 2z = 8, 2y - 3z = 3,$$

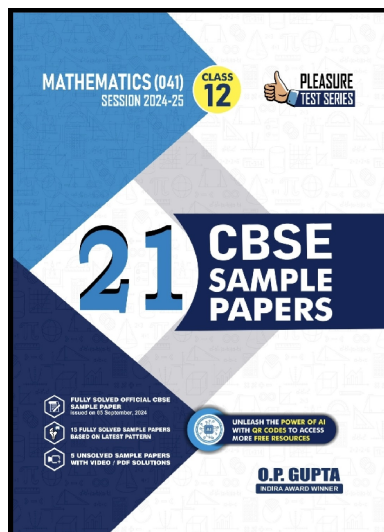
$$x - 2y + 6z = -2.$$

Q15. If $A^{-1} = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$, find $(AB)^{-1}$.

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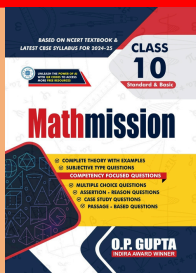
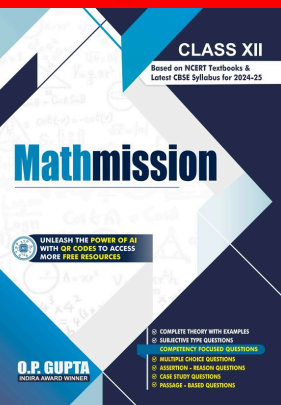
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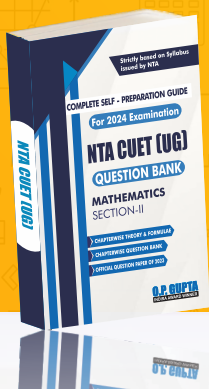


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