

Red Rose Senior Secondary School

Class: XII

Subject: MATHS

Chapter: 3 (MATRIX)

1. Using elementary transformations, find the inverse of the following matrix:

(6) [2008, 2009]

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$$

OR

Obtain the inverse of the following matrix using elementary operations:

$$A = \begin{bmatrix} 3 & 0 & -1 \\ 2 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}$$

2. Find the value of x from the following

(1) [2009]

$$\begin{bmatrix} 2x - y & 5 \\ 3 & y \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 3 & -2 \end{bmatrix}$$

3. For the following matrices A and B, Verify that $(AB)' = B'A'$ [2010]

$$A = \begin{bmatrix} 1 \\ -4 \\ 3 \end{bmatrix}, B = (-1, 2, 1)$$

(4)[2010]

4. If a matrix has 5 elements, write all possible orders it can have.

(1) [2011]

5. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$, write A^{-1} in terms of A.

(4)[2011]

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

(4)[2012]

7. Find the value of x+y from the following equation:

(1)[2012]

$$2 \begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$$

8. For what value of x, is the matrix $A = \begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$ a skew-symmetric matrix?

(4)[2013]

9. If matrix $A = \begin{bmatrix} 3 & -3 \\ -3 & 3 \end{bmatrix}$ and $A^2 = \lambda A$, then write the value of λ **(1) [2013]**
10. If A is a square matrix such that $A^2=A$, then write the value of $7A-(I+A)^3$, Where I is an identity matrix. **(1)[2014]**
11. If $\begin{bmatrix} x-y & z \\ 2x-y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, find the value of $x+y$ **(1) [2014]**
12. To promote the making of toilets for women, an organization tried to generate awareness through **(4)[2015]**
- House calls
 - Letters, and
 - Announcement. The cost for each mode per attempt is given below:
 - Rs. 50
 - Rs. 20
 - Rs. 40

The number of attempts made in three villages X, Y, and Z are given below:

	(i)	(ii)	(iii)
X	400	300	100
Y	300	250	75
Z	500	400	150

Find the total cost incurred by the organization for the three villages separately, using matrices. Write one value generated by the organization in society

13. Express the matrix $A = \begin{bmatrix} 2 & 4 & -6 \\ 7 & 3 & 5 \\ 1 & -2 & 4 \end{bmatrix}$ as the sum of symmetric and skew symmetric matrix. **(4)[2015 Comptt.]**

14. A trust fund has Rs. 35,000 is to be invested in two different types of bonds. The first bond pay 8% interest per annum which will be given to orphanage and second bond pays 10% interest per annum which will be given to an NGO (Cancer Aid Society). Using Matrix Multiplication, determine how to divide Rs.

35,000 among two types of bonds if the trust fund obtains an annual total interest of Rs 3,200. What are the values reflected in this question?

(4)[2015 Comptt.]

15. Use the elementary column operation $C_2 \rightarrow C_2 + 2C_1$ in the following matrix equation **(1) [2016]**

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

16. Write the number of all possible matrices of order 2X2 with each entry 1, 2 or 3 **(1)[2016]**

17. A trust invested some money in two types of bonds. The first bond pays 10% interest and second bond pays 12% interest. The trust received rupee 2800 as interest. However, if trust had interchanges money in bonds, they would have got rupee 100 less as interest. Using matrix method, find the amount invested by the trust. Interest received on this amount will be given to help page India as donation. Which value is reflected in this question? **(4)[2016]**

18. Find the value of x and y from the matrix equation: **(2) (comp.2017)**

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

19. Find the matrix A such that: **(4)(2017).**

$$\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$$

20. If a matrix $A = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$ is a skew symmetric matrix, find the value of a and b. **1 (2018)**

21. Given $A = \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$, compute A^{-1} and show that $2A^{-1} = 9I - A$. **2 (2018)**

22. Using elementary row transformation, find the inverse of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}. \quad \mathbf{6 \text{ (2018)}}$$

23. Find $|AB|$, if $A = \begin{bmatrix} 0 & -1 \\ 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 5 \\ 0 & 0 \end{bmatrix}$. $\mathbf{1 \text{ [2019]}}$

24. If A is a square matrix satisfying $AA' = I$, write the value of $|A|$. $\mathbf{1 \text{ [2019]}}$

25. If $A = \begin{bmatrix} p & 2 \\ 2 & p \end{bmatrix}$ and $|A^3| = 125$, then find the value of p . $\mathbf{2 \text{ [2019]}}$

26. If $A = \begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$, show that $(A - 2I)(A - 3I) = 0$. $\mathbf{2 \text{ [2019]}}$

27. using elementary transformation, find the inverse of the matrix

$$A = \begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}. \quad \mathbf{6 \text{ [2019]}}$$

28. Show that the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$, $A^3 - 6A^2 + 5A + 11I = 0$. Hence, find A^{-1} . $\mathbf{6 \text{ [2019]}}$

By : Nitin Sir

XXXXX