MATHS

BOOKS - MBD MATHS (ODIA ENGLISH)

MATRICES

Question Bank

1. State the order of [a b c] matrices.

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2. State the order of $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$ matrices.

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3. State the order of $\begin{bmatrix} x & y \\ y & z \\ z & x \end{bmatrix}$ matrices.

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4. State the order of $\begin{bmatrix} 1 & 0 & 1 & 4 \\ 2 & 1 & 3 & 0 \\ -3 & 2 & 1 & 3 \end{bmatrix}$ matrices.

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5. How many entries are there in a 3×3 matrix

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6. How many entries are there in a 3×4 matrix

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7. How many entries are there in a $p \times q$ matrix

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8. How many entries are there in a sqare matrix of order p?

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9. Give an example of 3×1matrix

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10. Give an example of 2×2matrix

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11. Give an example of 4×2matrix

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12. Give an example of 1×3matrix

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13. Let $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 1 \\ 4 & 5 & 6 & 1 & 2 \\ 3 & 9 & 1 & 1 & 6 \end{bmatrix}$ What is the order of A?

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14. Let $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 1 \\ 4 & 5 & 6 & 1 & 2 \\ 3 & 9 & 1 & 1 & 6 \end{bmatrix}$ Write down the entries a_{31}, a_{25}, a_{23} ?

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15. Let $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 1 \\ 4 & 5 & 6 & 1 & 2 \\ 3 & 9 & 1 & 1 & 6 \end{bmatrix}$ Write down A^T.

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16. Let $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 1 \\ 4 & 5 & 6 & 1 & 2 \\ 3 & 9 & 1 & 1 & 6 \end{bmatrix}$ What is the order of A^t ?

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17. Matrices A and B are given below .Find A+B,B+A,A-BandB -A Verify that

A+B=B+A and B-A=-(A-B).

$$A = \begin{bmatrix} 7 \\ 1 \end{bmatrix} B = \begin{bmatrix} -6 \\ 9 \end{bmatrix}$$

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18. Matrices A and B are given below .Find A+B,B+A,A-BandB -A Verify that

A+B=B+A and B-A=-(A-B).

$$A = \begin{bmatrix} 1 & a-b \\ a+b & -3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & b \\ -a & 5 \end{bmatrix}$$

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19. Find the $2 \times 2 matrix X$ if X+[[0,1], [1,0]]=[[2,0], [0,2]]`

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20. Find the $2 \times 2 matrix$X Given [x y z]-[-4 3 1] =[-5 1 0]`

derermine x,y,z.

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21. Find the $2 \times 2 mtrix X$ if [[x_1,x_2], [y_1,y_2]]-[[2,0],[0,2]]=[[3,5],[1,2]]$\det er \min e$x_1,x_2,y_1,y_2`.

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22. Find the 2×2 mtrix X find a matrix which when added to $\begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$ gives $\begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$

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23. Calculate whenever possible, $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \begin{bmatrix} 2 \\ 3 \end{bmatrix}$

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24. Calculate whenever possible, $\begin{bmatrix} 2 \\ 3 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$

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25. Calculate whenever possible, $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} 3 & 1 \\ 1 & 1 \end{bmatrix}$

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26. Calculate whenever possible,

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

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27. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate AB.

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28. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate BA.

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29. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate BC.

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30. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate CB.

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31. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate AC.

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32. If $A=\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix} B=\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}, C=\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$

Calculate CA.

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33. Find product: $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

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34. Find products : $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

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35. Find products : $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 1 & 3 \\ 1 & 4 \end{bmatrix}$

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36. Find products : $\begin{bmatrix} 1 & 3 \\ 1 & 4 \end{bmatrix}\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

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37. Find products : $\begin{bmatrix} 1 & i \\ i & -1 \end{bmatrix}^2 \text{where} I = \sqrt{-1}$

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38. Find products : $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

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39. Find products : $\begin{bmatrix} 0 & k \\ 1 & 0 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

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40. Find products : $\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

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41. Find products : $\begin{bmatrix} 1 & 0 \\ 0 & k \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

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42. Find products : $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

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43. Write true or false in the following case:

The sum of a 3×4 matrix with a 3×4 matrix is a 3×3 matrix.

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44. Write true or false in the following case:

$k[0] = 0, k \in R.$

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45. Write true or false in the following case:

A-B = B -A if one of A and B is zero and A and B are of the same order.

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46. Write true or false in the following case:

$A + B = B + A$, if A and B are matrices of the same order.

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47. Write true or false in the following case:

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

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48. Write true or false in the following case:

$$\begin{bmatrix} 3 & 1 \\ 6 & 2 \end{bmatrix} = 3\begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$$

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49. Write true or false in the following case:

With five elements a matrix can not be constructed.

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50. Write true or false in the following case:

The unit matrix is its own transpose.

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51. If

$$A = \begin{bmatrix} 2 & 4 \\ 3 & 13 \end{bmatrix} \text{and I} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \text{find} A - \alpha I, \alpha \in R.$$

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52. Find x and y :

$$\begin{bmatrix} x & -2y \\ 0 & -2 \end{bmatrix} = \begin{bmatrix} 1 & -8 \\ 0 & -2 \end{bmatrix}$$

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53. Find x and y :

$$\begin{bmatrix} x+3 \\ 2-y \end{bmatrix} = \begin{bmatrix} 1 \\ -3 \end{bmatrix}$$

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54. Find x and y :

$$\begin{bmatrix} 2x-y \\ x+y \end{bmatrix} = \begin{bmatrix} 3 \\ -9 \end{bmatrix}$$

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55. Find x and y :

$$\begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

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56. Find x and y :

$$[2x \quad -y] + [y \quad 3x] = 5[1 \quad 0]$$

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57. The element of ith row and jth column of the following matrix is $I + j$. Complete the matrix.

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

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58. Write down the matrix

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix} \text{if} a_{ij} = 2i + 3j$$

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59. Construct a 2×3 matrix having element:

$a_{ij} = i + j$

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60. Construct a 2×3 matrix having element:

$a_{ij} = i - j$

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61. Construct a 2×3 matrix having element:

$a_{ij} = i \times j$

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62. Construct a 2×3 matrix having element:

$a_{ji} = \frac{i}{j}$

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63. If $\begin{bmatrix} 2x & y \\ 1 & 3 \end{bmatrix} + \begin{bmatrix} 4 & 2 \\ 0 & -1 \end{bmatrix} = [[8, 3], 1, 2]$ Find x and y.

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64. Find A such that

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

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65. If $\begin{bmatrix} x+y & x-z \\ 2x-y & 0 \end{bmatrix} = \begin{bmatrix} 2 & 2 \\ 1 & 0 \end{bmatrix}$

find the values of x,y,z.

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66. What is the order of the matrix B if $[\begin{array}{ccc} 3 & 4 & 2 \end{array}] \mathrm{B}=[\begin{array}{ccccc} 2 & 1 & 0 & 3 & 6 \end{array}]$

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67. Find A if $\begin{bmatrix} 4 \\ 1 \\ 3 \end{bmatrix} A = \begin{bmatrix} -4 & 8 & 4 \\ -1 & 2 & 1 \\ -3 & 6 & 3 \end{bmatrix}$

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68. Find x and y when $\begin{bmatrix} 1 & 3 \\ 2 & -8 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 1 \end{bmatrix}$

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69. Find AB and BA given that:

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

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70. Find AB and BA given that:

$$A = \begin{bmatrix} 7 & 5 \\ 6 & 4 \end{bmatrix}, B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

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71. Find AB and BA given that:

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

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72. Find AB and BA given that:

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

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73. Evaluate $[[2, 1] + 2[0, -2]] \begin{bmatrix} 2 & 1 & 3 \\ 1 & -2 & 0 \end{bmatrix}$

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74. Evaluate $\left[\begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix} + \begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix}\right]\begin{bmatrix} 2 \\ 1 \end{bmatrix}$

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75. If A $\begin{bmatrix} 1 & 2 & 0 \\ 1 & 1 & 0 \\ -1 & 4 & 0 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 2 & 2 & 2 \end{bmatrix}$

Show that AB=AC

though $B \neq C$.Verify that: A+(B+C)=(A+B)+C

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76. If A $\begin{bmatrix} 1 & 2 & 0 \\ 1 & 1 & 0 \\ -1 & 4 & 0 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 2 & 2 & 2 \end{bmatrix}$

Show that AB=AC

though B '!=C`.Verify that: A(B+C)=AB+AC

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77. If A $\begin{bmatrix} 1 & 2 & 0 \\ 1 & 1 & 0 \\ -1 & 4 & 0 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & -1 \\ 2 & 2 & 2 \end{bmatrix}$

Show that AB=AC

though $B \neq C$.Verify that: A(BC) =(AB)C

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78. Find A and B where

$2A+B=\begin{bmatrix}2 & 2 & 5\\ 5 & 4 & 3\\ 1 & 1 & 4\end{bmatrix}$ and $A-2B=\begin{bmatrix}1 & 6 & 5\\ 5 & 2 & -1\\ -2 & -2 & 2\end{bmatrix}$

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79. If $A=\begin{bmatrix}4 & 2\\ -1 & 1\end{bmatrix}$

and I be the 2×2 unit matrix find (A-2I)(A-3I)

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80. Verify that $[AB]^T = B^T A^T$ where

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

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81. Verify that $[AB]^T = B^T A^T$ where

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

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82. Verify that $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ satisfies the equation $A^2 - (a+d)A + (ad-bc)I = 0$ where I is the 2x2 unit matrix.

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83. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 2 & 1 \end{bmatrix}$ "show that" $A^3 - 23A - 40I = 0$

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84. Simplify:

$$[\mathrm{x\ y\ z}] \times \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} \times \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

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85. If A and B are matrices of the same order and AB=BA, Then prove that $A^2 - B^2 = (A - B)(A + B)$

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86. If A and B are matrices of the same order and AB=BA, Then prove that $A^2 + 2AB + B^2 = (A + B)^2$

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87. If A and B are matrices of the same order and AB=BA, Then prove that $A^2 - 2AB + B^2 = (A - B)^2$

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88. If α and β are scalars and A is a square matrix then prove that

$(A - \alpha I).(A - \beta I) = A^2 - (\alpha + \beta)A + \alpha\beta I$

where I is a unit matrix of same order as A.

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89. If $\alpha \text{and} \beta$, are scalars such that $A = \alpha B + \beta I$, where A,B and the unit matrix I are of the same order, then prove that AB=BA.

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90. If $A = \begin{bmatrix} -1 & 3 & 5 \\ 1 & -3 & -5 \\ -1 & 3 & 5 \end{bmatrix}$ Show that $A^2 = A$.

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91. If $A = \begin{bmatrix} 0 & 2 & 3 \\ 2 & 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 6 & 3 \\ 1 & 4 & 5 \end{bmatrix}$

find $2A + 3B, 2A - 3B.$

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92. If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 3 & -1 \end{bmatrix}$,

$B = \begin{bmatrix} 4 & -1 & 3 \\ 0 & 2 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -3 & 0 \\ 1 & 4 & 5 \end{bmatrix}$

find $A - 3B + 3C$

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93. If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 3 & -1 \end{bmatrix}$,

$B = \begin{bmatrix} 4 & -1 & 3 \\ 0 & 2 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -3 & 0 \\ 1 & 4 & 5 \end{bmatrix}$

find $(A + B - C)^T$

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94. If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 3 & -1 \end{bmatrix}$,

$B = \begin{bmatrix} 4 & -1 & 3 \\ 0 & 2 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -3 & 0 \\ 1 & 4 & 5 \end{bmatrix}$

find $B^T - C^T$.

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95. If $A = \begin{bmatrix} 2 & 1 \\ -1 & 3 \end{bmatrix}, B = \begin{bmatrix} 2 & 3 \\ 1 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 & 2 \\ -2 & 3 & 0 \end{bmatrix}$, verify (A+B)C=AC+BC

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96. $\begin{bmatrix} 1 & -2 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} x & 2 \\ 1 & y \end{bmatrix} = \begin{bmatrix} -3 & 4 \\ -1 & 4 \end{bmatrix}$ Find x and y.

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97. If $A = \begin{bmatrix} 1 & -2 & 2 \\ 3 & 1 & -1 \end{bmatrix}$ $B \begin{bmatrix} 2 & 4 \\ 1 & 2 \\ 3 & -1 \end{bmatrix}$ verify that $(AB)^T = B^T A^T$.

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98. If A,B,C are matrices of order 2×2 each and

$2A + B + C = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$

$A + B + C = \begin{bmatrix} 0 & 1 \\ 2 & 1 \end{bmatrix}$

$A + B - C = \begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix}$ find A,B and C.

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99. If $\begin{bmatrix} x & y \\ x & \frac{x}{2} + t \end{bmatrix} + \begin{bmatrix} y & x + t \\ x + 2 & \frac{x}{2} \end{bmatrix} = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$

find x,y,z and t.

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100. State which of the following matrices is symmetric,slew symmetric, both or not either:

$$\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

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101. State which of the following matrices is symmetric,slew symmetric, both or not either:

$$\begin{bmatrix} 0 & 1 & 2 \\ -1 & y & 3 \\ -2 & -3 & z \end{bmatrix}$$,(x,y,z) != (0,0,0)

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102. State which of the following matrices is symmetric,slew symmetric, both or not either:

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

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103. State which of the following matrices is symmetric,slew symmetric, both or not either:

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

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104. State which of the following matrices is symmetric,slew symmetric, both or not either:

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

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105. State which of the following matrices is symmetric,slew symmetric, both or not either:

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

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106. State which of the following matrices is symmetric,slew symmetric, both or not either:

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

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107. State'True'or'false':If A and B are symmetric matrices of the same order and $AB - BA \neq 0$, then AB is not symmetric

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108. State'True'or'false':For any square matrix A, AA' is symmetric.

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109. State'True'or'false':If A is any skew symmetric matrix, then A^2 is also skew symmetric.

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110. State'True'or'false': If A is symmetric, then $A^2, A^3, \ldots\ldots, A^n$ are all symmetric.

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111. State'True'or'false':If A is symmetric then $A - A^1$ is both symmetric and skew symmetric.

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112. State'True'or'false':For any square matrix $\left(A - A^1\right)^2$ is skew symmetric.

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113. State'True'or'false': A matrix which is not symmetric is skew symmetric.

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114. If A and B are symmetric matrices of the same order with $AB \neq BA$, final whether AB-BA is symmetric or skew symmetric.

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115. A and B are square matrices of the same order, prove that : if A,B and AB are all symmetric, then AB-BA =0

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116. A and B are square matrices of the same order, prove that :If A,B and AB are all skew symmetric then AB+BA=0

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117. If A= $\begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ -2 & 5 & 3 \end{bmatrix}$, then verify that

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ -2 & 5 & 3 \end{bmatrix}$$

$$\Rightarrow A' = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 1 & 5 \\ 0 & 3 & 3 \end{bmatrix}$$

A+A' is symmetric

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118. If A= $\begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ -2 & 5 & 3 \end{bmatrix}$, then verify that

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ -2 & 5 & 3 \end{bmatrix}$$

$$\Rightarrow A' = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 1 & 5 \\ 0 & 3 & 3 \end{bmatrix}$$

A+A' is skmmetric

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119. Prove that A unit matrix is its own inverse. Is the converse true?If $A = \begin{bmatrix} 0 & 1 & -1 \\ 4 & -3 & 4 \\ 3 & -3 & 4 \end{bmatrix}$ show that $A^2 = I$and hence $A = A^{-1}$.

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120. Show that $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ is its own inverse.

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121. Express as a sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 0 & 1 \\ -1 & 5 & -2 \end{bmatrix}$$

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122. Express as a sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 2 & -1 & 3 \\ 5 & 7 & -2 \\ 1 & 4 & 6 \end{bmatrix}$$

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123. Express as a sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} x & a & b \\ a & y & c \\ b & c & z \end{bmatrix}$$

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124. Express as a sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 0 & x \\ -x & 0 \end{bmatrix}$$

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125. Express as a sum of a symmetric and a skew symmetric matrix:

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

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126. Express as a sum of a symmetric and a skew symmetric matrix:

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

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127. Express as a sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

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128. What is the inverse of :

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

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129. What is the inverse of :

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

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130. Find inverse of the following matrices by elementary row/column operation (transformations):

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

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131. Find inverse of the following matrices by elementary row/column operation (transformations):

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

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132. Find inverse of the following matrices by elementary row/column operation (transformations):

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

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133. Find inverse of the following matrices by elementary row/column operation (transformations):

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

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134. Find inverse of the following matrices by elementary row/column operation (transformations):

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

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135. Find inverse of the following matrices by elementary row/column operation (transformations):

$$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

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136. Find the inverse of the following matrices using elementary transformation

$$\begin{bmatrix} 0 & 0 & 2 \\ 0 & 2 & 0 \\ 2 & 0 & 0 \end{bmatrix}$$

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137. Find the inverse of the following matrices using elementary transformation

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

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138. Find the inverse of the following matrices using elementary transformation:

$$\begin{bmatrix} 1 & 1 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$$

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139. Find the inverse of the following matrices using elementary transformation:

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

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