



MATHS

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MATRIX

Question Bank

1. Find the value of a,b,c and d from equation :

$$\begin{bmatrix} a - b & 2a + c \\ 2a - b & 3c + d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$$

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2. Given $A = \begin{bmatrix} 1/2 & 4 \\ 2 & 3/2 \end{bmatrix}$ and $B = \begin{bmatrix} 5/2 & 4 \\ 1 & 1/2 \end{bmatrix}$, Find A-B.

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3. Given $A = \begin{bmatrix} 5/2 & 4 \\ 6 & 3/2 \end{bmatrix}$ and $B = \begin{bmatrix} 1/2 & 2 \\ 4 & 1/2 \end{bmatrix}$, Find $A-B$.

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4. If, $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & -3 & 5 \\ -2 & 3 & 4 \end{bmatrix}$, then is $4A = \begin{bmatrix} 4 & 4 & 8 \\ 0 & -12 & 20 \\ -8 & 12 & 16 \end{bmatrix}$?

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5. If, $A = \begin{bmatrix} 1 & 2 \\ -2 & 4 \end{bmatrix}$, then $-3A = \begin{bmatrix} -3 & -6 \\ 6 & -12 \end{bmatrix}$

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6. Given $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}_{2 \times 2}$ and $B = \begin{bmatrix} 1 & 4 & 2 \\ 2 & 3 & 0 \end{bmatrix}_{2 \times 3}$, Find AB .

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7. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$ then show $AB = BA = \begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$

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8. If $A = \begin{bmatrix} 0 & 2 \\ 0 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ 0 & 0 \end{bmatrix}$ then $AB = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

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9. If $A = \begin{bmatrix} 1 & 2 & 5 \\ 2 & 4 & 8 \end{bmatrix}_{2 \times 3}$ then $A' = A^T = \begin{bmatrix} 1 & 2 \\ 2 & 4 \\ 5 & 8 \end{bmatrix}_{3 \times 2}$

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10. Show that $A = \begin{bmatrix} 1 & 5 & 6 \\ 5 & 2 & 7 \\ 6 & 7 & 3 \end{bmatrix}$ is a symmetric matrix as $A^T = A$.

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11. Prove that $A = \begin{bmatrix} 0 & 1 & 2 \\ -1 & 0 & 3 \\ -2 & -3 & 0 \end{bmatrix}$ is a skew symmetric matrix as $A^T = -A$.

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12. Express the matrix $\begin{bmatrix} 3 & 5 \\ 1 & -1 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

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13. If A is a matrix of order 3×7 and B is a matrix of order 7×3 then what will be the order of the matrix AB and BA?

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14. Given that, $A = (a_{ij})_{3 \times 3} = \begin{bmatrix} 1 & 6 & -1 \\ 5 & 2 & 7 \\ 1 & 3 & -5 \end{bmatrix}_{3 \times 3}$ then find the values:

Where a denote the corresponding elements of the matrix A .

$$a_{31} + a_{23} + a_{33}$$

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15. Given that, $A = (a_{ij})_{3 \times 3} = \begin{bmatrix} 1 & 6 & -1 \\ 5 & 2 & 7 \\ 1 & 3 & -5 \end{bmatrix}_{3 \times 3}$ then find the values:

Where a denote the corresponding elements of the matrix A .

$$\frac{3}{2}a_{21} + \frac{1}{2}a_{11}$$

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16. Given that, $A = (a_{ij})_{(3 \times 3)} = [(1,6,-1),(5,2,7),(1,3,-5)]_{(3 \times 3)}$

then find the values: Where a denote the corresponding elements of the matrix A .

$$2a_{13} + 7a_{12} + a_{22}$$

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17. If $A = \begin{bmatrix} 1 & -1 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 2 \\ 3 & 1 \end{bmatrix}$ then find the values $2A+5B$

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18. If $A = \begin{bmatrix} 1 & -1 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 2 \\ 3 & 1 \end{bmatrix}$ then find the values $A^2 - 2B^{-1}$

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19. If $A = \begin{bmatrix} 1 & -1 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 2 \\ 3 & 1 \end{bmatrix}$ then find the values $BA+2I$, where I is the identity matrix.

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20. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 2 \end{bmatrix}_{2 \times 2}$ and $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \end{bmatrix}_{2 \times 2}$ Find AB .

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21. In the matrix $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 6 & 1 \end{bmatrix}$, write the order of the matrix

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22. In the matrix $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 6 & 1 \end{bmatrix}$, write the elements, what are the possible orders it can have?

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23. If a matrix has 12 elements, what are the possible order in can have ?

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24. Construct a 2×2 matrix A whose elements are given by $a_{ij} = 2i + j$

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25. Construct a 2×2 matrix A whose elements are given by

$$a_{ij} = \frac{1}{2}(i - 2j)^2$$

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26. Construct a 2×2 matrix A whose elements are given by

$$a_{ij} = \frac{1}{2}|-3i + j|$$

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27. If $\begin{bmatrix} a + b & 2 \\ 5 & ab \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$, Find the values of a and b.

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28. Find x, y, a and b if $\begin{bmatrix} 2x + 3y & a + b & 8 \\ 1 & 4x + y & 3a - 4b \end{bmatrix} = \begin{bmatrix} 7 & 1 & 8 \\ 1 & 9 & 10 \end{bmatrix}$.

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29. Find the number of all possible matrices of order 3×3 with each entry 0 and 1.

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30. Let, $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find each of the A+B

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31. Let, $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find each of the $3A-C$

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32. Let, $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find AB

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33. Let, $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find BA

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34. Find the product of $\begin{bmatrix} a & b \\ -b & a \end{bmatrix} \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$

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35. Find the product of $\begin{bmatrix} 2 & 1 \\ 3 & 2 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 1 \\ -1 & 2 & 1 \end{bmatrix}$

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36. Find the product of $\begin{bmatrix} 2 & 3 & 4 \\ 3 & 4 & 5 \\ 4 & 5 & 6 \end{bmatrix} \begin{bmatrix} 1 & -3 \\ 0 & 2 \\ 3 & 0 \end{bmatrix}$

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37. Find X and Y, if $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

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38. Find X and Y, if $2X + 3Y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3X + 2Y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$

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39. Find $A^2 - 5A + 6I$, if $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$.

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40. Find the transpose of matrices $\begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \end{bmatrix}$

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41. Find the transpose of matrices : $\begin{bmatrix} 3 \\ 0 \\ 5 \end{bmatrix}$

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

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43. Find the value of x if $A + A^T = I$, where $A = \begin{bmatrix} \cos x & -\sin x \\ \sin x & \cos x \end{bmatrix}$.

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44. If A, B are symmetric matrices of same order then show that $AB - BA$ is a skew symmetric matrix.

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45. Express matrices as the sum of a symmetric and skew symmetric

matrix $\begin{bmatrix} 1 & 5 \\ -1 & 2 \end{bmatrix}$



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46. Express matrices as the sum of a symmetric and skew symmetric

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



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