EduSahara™ Worksheet

Name : Chapter Based Worksheet

Chapter : Matrices

Grade : ICSE Grade X

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1. If $A = \begin{bmatrix} 1 & 1 & -2 \\ 3 & 1 & -1 \\ 3 & 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 & -1 \\ -1 & 2 & 2 \\ -1 & -2 & -2 \end{bmatrix}$, then $A \times B =$

   (i) $\begin{bmatrix} 3 & 7 & 5 \\ 3 & 7 & 1 \\ -1 & -1 & -7 \end{bmatrix}$ (ii) $\begin{bmatrix} 2 & 7 & 5 \\ 3 & 7 & 1 \\ 2 & -1 & -7 \end{bmatrix}$ (iii) $\begin{bmatrix} 2 & 7 & 5 \\ 3 & 7 & 1 \\ -1 & -1 & -7 \end{bmatrix}$ (iv) $\begin{bmatrix} 2 & 7 & 5 \\ 3 & 7 & 1 \\ -2 & -1 & -7 \end{bmatrix}$ (v) $\begin{bmatrix} 2 & 5 & 5 \\ 3 & 7 & 1 \\ -1 & -1 & -7 \end{bmatrix}$

2. If the elements of matrix A are multiplied with 0 , we get

   (i) additive identity of A (ii) multiplicative identity of A (iii) additive inverse of A

   (iv) multiplicative inverse of A

3. Which of the following matrices is a 2×2 matrix ?

   (i) $\begin{bmatrix} 7 & 6 & 1 \\ 9 & 6 & 3 \\ 4 & 3 & 3 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 7 \\ 1 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & 1 \\ 1 & 2 \\ 3 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} 6 & 2 & 9 \\ 3 & 3 & 6 \\ 3 & 2 & 6 \end{bmatrix}$ (v) $\begin{bmatrix} 6 & 7 & 6 \\ 8 & 5 & 9 \end{bmatrix}$

4. Which of the following pairs of matrices can be multiplied?

   (i) $\begin{bmatrix} -6 & -5 \\ 6 & 9 \end{bmatrix}, \begin{bmatrix} -8 & 1 \\ 5 & 5 \end{bmatrix}$ (ii) $\begin{bmatrix} 9 & 1 & 0 \end{bmatrix}, \begin{bmatrix} 6 & 4 & -3 \\ -1 & -7 & -5 \end{bmatrix}$ (iii) $\begin{bmatrix} -6 & -5 \\ 6 & 9 \end{bmatrix}, \begin{bmatrix} 2 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} -6 & -5 \\ 6 & 9 \end{bmatrix}, \begin{bmatrix} 6 & 3 \\ -2 & 9 \\ 5 & -2 \end{bmatrix}$

   (v) $\begin{bmatrix} 3 \\ 4 \\ 6 \end{bmatrix}, \begin{bmatrix} 6 & 3 \\ -2 & 9 \\ 5 & -2 \end{bmatrix}$

5. The order of matrix $A = \begin{bmatrix} 2 & -5 & 3 \\ -2 & -5 & -5 \\ 3 & -4 & 5 \end{bmatrix}$ is

   (i) 3×2 (ii) 2×3 (iii) 4×3 (iv) 3×3 (v) 3×4

6. The principal diagonal elements of the given matrix $\begin{bmatrix} -9 & 1 & -3 \\ 6 & 3 & 8 \\ 4 & -5 & 5 \end{bmatrix}$ are

   (i) $-3, 3, 4$ (ii) $-9, 3, 5$ (iii) $1, 6, -5$ (iv) $-9, -3, 3$

7. The principal diagonal elements of the given matrix $\begin{bmatrix} 4 & -1 \\ -3 & -5 \end{bmatrix}$ are

   (i) $4, -3$ (ii) $-1, -3$ (iii) $4, -5$ (iv) $-1, -5$

8. Find the additive identity of matrix $A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 0 & -4 \\ 4 & 1 & -3 \end{bmatrix}$

(i) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & 0 & -2 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

9. Which of the following is an identity matrix ?

(i) $\begin{bmatrix} -2 & 0 \\ 0 & 1 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$

10. If the order of matrix A is $m \times n$ and B is $n \times o$, then the order of $(A \times B)$ is

(i) $m \times n$ (ii) $m \times o$ (iii) $n \times o$ (iv) $o \times m$

11. Which of the following are true?

a) If a matrix is symmetric, then it is a square matrix
b) A rectangular matrix cannot be symmetric
c) If a matrix is symmetric then it is equal to its transpose
d) A matrix is symmetric if the principal diagonal elements are same

(i) {d,a} (ii) {d,b} (iii) {d,c} (iv) {a,b,c} (v) {d,a,b}

12. If $A = \begin{bmatrix} 0 & -1 \\ -2 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$ and $C = \begin{bmatrix} -2 \end{bmatrix}$, then compute the product $(A \times B) \times C =$

(i) $\begin{bmatrix} 4 \\ -18 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 \\ -16 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 \\ -13 \end{bmatrix}$ (iv) $\begin{bmatrix} 3 \\ -16 \end{bmatrix}$ (v) $\begin{bmatrix} 4 \\ -15 \end{bmatrix}$

13. If $A = \begin{bmatrix} -2 & 6 \\ -8 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -6 & 5 \\ -2 & 4 \end{bmatrix}$ and $D = \begin{bmatrix} 28 & -16 \\ -4 & -4 \end{bmatrix}$, $4A - 8B + 3C = D$, then C = ?

(i) $\begin{bmatrix} -4 & 1 \\ 4 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} -4 & -3 \\ 4 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} -4 & 0 \\ 4 & 3 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 & 0 \\ 4 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} -4 & 0 \\ 4 & 6 \end{bmatrix}$

14. Find the additive identity of matrix $A = \begin{bmatrix} 2 & -7 \\ 7 & -6 \end{bmatrix}$

(i) $\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & 0 \\ 0 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} -3 & 0 \\ 0 & 0 \end{bmatrix}$

15. Which of the following are true?

a) A null matrix is a square matrix
b) A row matrix is a square matrix
c) An identity matrix is a square matrix
d) A column matrix is a square matrix

(i) {a,c} (ii) {b,c} (iii) {c} (iv) {d,a,c}

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

then $(A+B)+C =$

(i) $\begin{bmatrix} 3 & 0 \\ 1 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 0 \\ 1 & 1 \end{bmatrix}$ (iii) $\begin{bmatrix} 3 & 0 \\ 0 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} 3 & 0 \\ 1 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 3 & 0 \\ 1 & -2 \end{bmatrix}$

17. Which of the following are true ?

a) Only square matrices have determinants
b) A square matrix whose determinant is zero is called a singular matrix
c) A square matrix whose determinant is zero is called a non-singular matrix
d) Rectangular matrices can also have determinants

(i) {c,b,a} (ii) {c,d,a} (iii) {a,b} (iv) {c,a} (v) {d,b}

18. Which of the following is a diagonal matrix ?

(i) $\begin{bmatrix} 7 & 0 & 4 \\ 0 & 4 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ (ii) $\begin{bmatrix} 7 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & 0 & 0 \\ 0 & 4 & 0 \\ 4 & 0 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & 0 & 7 \\ 0 & 4 & 0 \\ 2 & 0 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} 7 & 0 & 7 \\ 0 & 4 & 0 \\ 2 & 0 & 2 \end{bmatrix}$

19. If $X + Y = \begin{bmatrix} 1 & 2 \\ -5 & -12 \end{bmatrix}$ & $X - Y = \begin{bmatrix} 3 & -16 \\ 11 & -2 \end{bmatrix}$, find X and Y

(i) $\begin{bmatrix} 2 & -7 \\ 3 & -7 \end{bmatrix}, \begin{bmatrix} -1 & 9 \\ -8 & -5 \end{bmatrix}$ (ii) $\begin{bmatrix} 2 & -7 \\ 2 & -7 \end{bmatrix}, \begin{bmatrix} -1 & 9 \\ -8 & -5 \end{bmatrix}$ (iii) $\begin{bmatrix} 2 & -7 \\ 3 & -7 \end{bmatrix}, \begin{bmatrix} -1 & 9 \\ -5 & -5 \end{bmatrix}$ (iv) $\begin{bmatrix} -1 & 9 \\ -8 & -5 \end{bmatrix}, \begin{bmatrix} 2 & -7 \\ 3 & -7 \end{bmatrix}$

20. If $A = \begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$ and $B = \begin{bmatrix} p & q \\ r & s \\ t & u \end{bmatrix}$,

then $(A \times B) =$

(i) $\begin{bmatrix} ap+br+ct & aq+bs+cu \\ dp+er+ft & dq+es+fu \end{bmatrix}$ (ii) $\begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$ (iii) $\begin{bmatrix} pa+qd & pb+qe & pc+qf \\ ra+sd & rb+se & rc+sf \\ ta+ud & tb+ue & tc+uf \end{bmatrix}$

(iv) $\begin{bmatrix} ap+dq & ar+ds & at+du \\ bp+eq & br+es & bt+eu \\ cp+fq & cr+fs & ct+fu \end{bmatrix}$ (v) $\begin{bmatrix} ap+br+ct & dp+er+ft \\ aq+bs+cu & dq+es+fu \end{bmatrix}$

21. If $A = \begin{bmatrix} 4 & 7 \\ 8 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 9 \\ 7 & 3 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} -17 & -22 \\ -40 & -30 \end{bmatrix}$ (ii) $\begin{bmatrix} -17 & -22 \\ -39 & -30 \end{bmatrix}$ (iii) $\begin{bmatrix} -16 & -22 \\ -39 & -30 \end{bmatrix}$ (iv) $\begin{bmatrix} -20 & -22 \\ -39 & -30 \end{bmatrix}$ (v) $\begin{bmatrix} -17 & -20 \\ -39 & -30 \end{bmatrix}$

22. The order of matrix $A = \begin{bmatrix} 2 & 1 \\ -5 & 4 \\ 1 & 4 \end{bmatrix}$ is

(i) 3×3 (ii) 4×2 (iii) 3×2 (iv) 2×2 (v) 2×3

23. If $A = \begin{bmatrix} 9 & 4 \\ 3 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 8 \\ 4 & 2 \end{bmatrix}$, find $A^2 + B^2 - 2AB$

(i) $\begin{bmatrix} 37 & -48 \\ -7 & 21 \end{bmatrix}$ (ii) $\begin{bmatrix} 37 & -45 \\ -8 & 21 \end{bmatrix}$ (iii) $\begin{bmatrix} 37 & -48 \\ -8 & 21 \end{bmatrix}$ (iv) $\begin{bmatrix} 37 & -48 \\ -8 & 18 \end{bmatrix}$ (v) $\begin{bmatrix} 37 & -48 \\ -9 & 21 \end{bmatrix}$

24. Find A , given that $A + 6\begin{bmatrix} -8 & -8 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} -55 & -57 \\ 19 & 27 \end{bmatrix}$

(i) $\begin{bmatrix} -10 & -9 \\ -5 & 9 \end{bmatrix}$ (ii) $\begin{bmatrix} -7 & -9 \\ -6 & 9 \end{bmatrix}$ (iii) $\begin{bmatrix} -7 & -8 \\ -5 & 9 \end{bmatrix}$ (iv) $\begin{bmatrix} -7 & -9 \\ -5 & 9 \end{bmatrix}$ (v) $\begin{bmatrix} -7 & -9 \\ -5 & 12 \end{bmatrix}$

25. Which of the following matrices is a 2×1 matrix ?

(i) $\begin{bmatrix} 6 \\ 7 \\ 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 5 & 9 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 \\ 4 \end{bmatrix}$ (iv) $\begin{bmatrix} 7 & 2 \\ 3 & 1 \\ 7 & 9 \end{bmatrix}$ (v) $\begin{bmatrix} 3 & 9 \\ 3 & 7 \end{bmatrix}$

Assignment Key

1) (iii)	2) (i)	3) (ii)	4) (i)	5) (iv)	6) (ii)
7) (iii)	8) (v)	9) (iv)	10) (ii)	11) (iv)	12) (ii)
13) (iv)	14) (iv)	15) (iii)	16) (iv)	17) (iii)	18) (ii)
19) (i)	20) (i)	21) (ii)	22) (iii)	23) (iii)	24) (iv)
25) (iii)					

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