EduSahara™ Worksheet

Name : Chapter Based Worksheet

Chapter : Matrices

Grade : ICSE Grade X

1. If $A = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 9 & 1 \\ 9 & 3 \end{bmatrix}$, then $A + B =$

   (i) $\begin{bmatrix} 9 & 2 \\ 14 & 6 \end{bmatrix}$ (ii) $\begin{bmatrix} 9 & 2 \\ 11 & 6 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 2 \\ 12 & 6 \end{bmatrix}$ (iv) $\begin{bmatrix} 9 & 2 \\ 11 & 5 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & 0 \\ 11 & 6 \end{bmatrix}$

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

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

3. Which of the following are true?

   a) An identity matrix is a scalar matrix
   b) An identity matrix is a square matrix
   c) A scalar matrix is an identity matrix
   d) A null matrix is a scalar matrix

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

4. The order of matrix $A = \begin{bmatrix} -3 & 0 \\ 2 & -3 \end{bmatrix}$ is

   (i) 2×1 (ii) 2×2 (iii) 3×2 (iv) 1×2 (v) 2×3

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

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

6. If $A = \begin{bmatrix} -1 & 7 \\ -8 & -9 \end{bmatrix}$, then find B satisfying $A + B = A$

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

7. Find the multiplicative identity of matrix $A = \begin{bmatrix} -8 & 8 \\ 2 & -8 \end{bmatrix}$

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

8. If $A = \begin{bmatrix} (-9) & (-3) \end{bmatrix}$, $B = \begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} (-9x-3y) \\ (-9x-3y) \end{bmatrix}$ (ii) $\begin{bmatrix} (-9x-3y) \end{bmatrix}$ (iii) $\begin{bmatrix} (-9x-3y) & (-9x-3y) \end{bmatrix}$ (iv) $\begin{bmatrix} (-9x) & (-9y) \\ (-3x) & (-3y) \end{bmatrix}$

(v) $\begin{bmatrix} (-9x) & (-3x) \\ (-9y) & (-3y) \end{bmatrix}$

9. If $A = \begin{bmatrix} 9 & 5 \\ 8 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ 8 & 4 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} 77 & -30 \\ 112 & -18 \end{bmatrix}$ (ii) $\begin{bmatrix} 77 & -30 \\ 115 & -15 \end{bmatrix}$ (iii) $\begin{bmatrix} 77 & -31 \\ 112 & -15 \end{bmatrix}$ (iv) $\begin{bmatrix} 77 & -30 \\ 112 & -15 \end{bmatrix}$ (v) $\begin{bmatrix} 77 & -30 \\ 112 & -14 \end{bmatrix}$

10. If $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ and $B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$,

then $(A \times B) =$

(i) $\begin{bmatrix} a_{11}b_{11} + a_{21}b_{12} & a_{11}b_{21} + a_{21}b_{22} \\ a_{12}b_{11} + a_{22}b_{12} & a_{12}b_{21} + a_{22}b_{22} \end{bmatrix}$ (ii) $\begin{bmatrix} a_{11}b_{11} + a_{12}b_{21} & a_{11}b_{12} + a_{12}b_{22} \\ a_{21}b_{11} + a_{22}b_{21} & a_{21}b_{12} + a_{22}b_{22} \end{bmatrix}$

(iii) $\begin{bmatrix} a_{11}b_{11} + a_{12}b_{21} & a_{21}b_{11} + a_{22}b_{21} \\ a_{11}b_{12} + a_{12}b_{22} & a_{21}b_{12} + a_{22}b_{22} \end{bmatrix}$ (iv) $\begin{bmatrix} a_{11}b_{11} + a_{12}b_{12} & a_{11}b_{21} + a_{12}b_{22} \\ a_{21}b_{11} + a_{22}b_{12} & a_{21}b_{21} + a_{22}b_{22} \end{bmatrix}$

(v) $\begin{bmatrix} b_{11}a_{11} + b_{12}a_{21} & b_{11}a_{12} + b_{12}a_{22} \\ b_{21}a_{11} + b_{22}a_{21} & b_{21}a_{12} + b_{22}a_{22} \end{bmatrix}$

11. Which of the following is a row matrix

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

12. Which of the following is an identity matrix ?

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

13. The number of columns in matrix $A = \begin{bmatrix} 5 & -4 \\ -2 & 8 \end{bmatrix}$ is

(i) 1 (ii) 4 (iii) 0 (iv) 2 (v) 3

14. The order of matrix $A = \begin{bmatrix} -3 & 1 & -4 \\ 0 & -2 & -3 \\ 0 & 5 & -5 \end{bmatrix}$ is

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

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

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

(v) $\begin{bmatrix} 9 & -7 & -3 \end{bmatrix}, \begin{bmatrix} -8 & 4 & -2 \\ -2 & 0 & 9 \end{bmatrix}$

16. Which of the following matrices can be added to $\begin{bmatrix} 6 & 8 \\ 9 & 8 \end{bmatrix}$?

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

17. If $A = \begin{bmatrix} -3 & -3 \\ -4 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 0 \\ -4 & -4 \end{bmatrix}$, then $3A + 5B =$

(i) $\begin{bmatrix} -24 & -9 \\ -32 & -25 \end{bmatrix}$ (ii) $\begin{bmatrix} -24 & -9 \\ -32 & -23 \end{bmatrix}$ (iii) $\begin{bmatrix} -23 & -9 \\ -32 & -23 \end{bmatrix}$ (iv) $\begin{bmatrix} -22 & -9 \\ -32 & -23 \end{bmatrix}$ (v) $\begin{bmatrix} -24 & -9 \\ -32 & -24 \end{bmatrix}$

18. Which of the following matrices is comparable to the given matrix $\begin{bmatrix} 1 & 9 \\ 1 & 5 \end{bmatrix}$?

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

19. Find A , given that $A + 6\begin{bmatrix} -5 & -4 \\ -2 & -6 \end{bmatrix} = \begin{bmatrix} -27 & -26 \\ -4 & -44 \end{bmatrix}$

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

20. Which of the following are true for matrices A, B and C ?

a) $A \times (B + C) = (A \times B) + (A \times C)$
b) $(A \times I) = (I \times A) = A$
c) $(A + B) \times C = (A \times B) + (A \times C)$
d) $(A \times I) = (I \times A) = I$
e) $(A \times B) = (B \times A)$
f) $A \times (B \times C) = (A \times B) \times C$

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

21. If $A = \begin{bmatrix} -6 & -3 \\ -5 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} -9 & -2 \\ 4 & -2 \end{bmatrix}$ and $D = \begin{bmatrix} 8 & 13 \\ -89 & -42 \end{bmatrix}$,

$9A - 10B + 4C = D$, then C = ?

(i) $\begin{bmatrix} -7 & 5 \\ -2 & -2 \end{bmatrix}$ (ii) $\begin{bmatrix} -7 & 5 \\ 0 & -2 \end{bmatrix}$ (iii) $\begin{bmatrix} -7 & 5 \\ -4 & -2 \end{bmatrix}$ (iv) $\begin{bmatrix} -7 & 5 \\ -1 & -2 \end{bmatrix}$ (v) $\begin{bmatrix} -4 & 5 \\ -1 & -2 \end{bmatrix}$

22. Which of the following is a null matrix ?

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

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

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

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

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

25. Given $A = \begin{bmatrix} 0 & 1 \\ 7 & 4 \end{bmatrix}$ find B such that $AB = BA = A$

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

Assignment Key

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