EduSahara™ Assignment

Name : Matrix Multiplication

Chapter : Matrices

Grade : ICSE Grade X

1. If $A = \begin{bmatrix} -5 & -9 \\ -1 & -7 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 1 \\ 8 & 7 \end{bmatrix}$, then $A \times B =$

   (i) $\begin{bmatrix} -61 & -68 \\ -54 & -50 \end{bmatrix}$ (ii) $\begin{bmatrix} -62 & -68 \\ -51 & -50 \end{bmatrix}$ (iii) $\begin{bmatrix} -62 & -68 \\ -54 & -51 \end{bmatrix}$ (iv) $\begin{bmatrix} -62 & -68 \\ -54 & -50 \end{bmatrix}$ (v) $\begin{bmatrix} -64 & -68 \\ -54 & -50 \end{bmatrix}$

2. Which of the following is an identity matrix ?

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

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

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

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

   (i) $\begin{bmatrix} 3 & -3 & 0 \\ 4 & -2 & 2 \\ -2 & -2 & -4 \end{bmatrix}$ (ii) $\begin{bmatrix} -5 & -4 \\ 4 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} -8 & -4 \\ 4 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} 3 & 4 & -2 \\ -3 & -2 & -2 \\ 0 & 2 & -4 \end{bmatrix}$ (v) $\begin{bmatrix} -5 & -4 \\ 4 & 2 \end{bmatrix}$

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

   (i) $\begin{bmatrix} 8 & 4 & 6 \\ -15 & -2 & -4 \\ -24 & -4 & -2 \end{bmatrix}$ (ii) $\begin{bmatrix} 8 & 4 & 6 \\ -16 & -2 & -4 \\ -24 & -4 & -2 \end{bmatrix}$ (iii) $\begin{bmatrix} 8 & 4 & 6 \\ -17 & -2 & -4 \\ -24 & -4 & -2 \end{bmatrix}$ (iv) $\begin{bmatrix} 8 & 4 & 6 \\ -16 & -2 & -4 \\ -26 & -4 & -2 \end{bmatrix}$ (v) $\begin{bmatrix} 8 & 7 & 6 \\ -16 & -2 & -4 \\ -24 & -4 & -2 \end{bmatrix}$

6. If $A = \begin{bmatrix} -3 & 4 & 0 \\ -3 & 2 & 4 \\ -4 & -2 & -2 \end{bmatrix}$, then $7A =$

   (i) $\begin{bmatrix} -21 & 28 & 0 \\ -21 & 14 & 28 \\ -28 & -14 & -14 \end{bmatrix}$ (ii) $\begin{bmatrix} -22 & 28 & 0 \\ -21 & 14 & 28 \\ -28 & -14 & -14 \end{bmatrix}$ (iii) $\begin{bmatrix} -21 & 29 & 0 \\ -21 & 14 & 28 \\ -28 & -14 & -14 \end{bmatrix}$ (iv) $\begin{bmatrix} -21 & 28 & 0 \\ -19 & 14 & 28 \\ -28 & -14 & -14 \end{bmatrix}$ (v) $\begin{bmatrix} -21 & 28 & 0 \\ -21 & 14 & 28 \\ -28 & -16 & -14 \end{bmatrix}$

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

then $(A \times B) \times C =$

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

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

then $(A \times B) + C =$

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

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

then $A \times (B + C) =$

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

10. If $A = \begin{bmatrix} 1 & -7 \\ 6 & -5 \end{bmatrix}$ and $C = \begin{bmatrix} -7 \\ -5 \end{bmatrix}$,

find a matrix B satisfying $A \times B = C$

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

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

then compute the product $(A \times B) \times C =$

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

12. If $A = \begin{bmatrix} -1 & 3 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 7 \\ 8 & -9 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -8 \\ 8 & -8 \end{bmatrix}$,

then compute $A^2 + BC =$

(i) $\begin{bmatrix} 67 & -72 \\ -56 & 15 \end{bmatrix}$ (ii) $\begin{bmatrix} 67 & -72 \\ -53 & 15 \end{bmatrix}$ (iii) $\begin{bmatrix} 67 & -72 \\ -58 & 15 \end{bmatrix}$ (iv) $\begin{bmatrix} 67 & -72 \\ -56 & 16 \end{bmatrix}$ (v) $\begin{bmatrix} 66 & -72 \\ -56 & 15 \end{bmatrix}$

13. If $A = \begin{bmatrix} 4 & 3 \\ 0 & 3 \end{bmatrix}$, then find AI

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

14. If $A = \begin{bmatrix} -1 & -9 \\ 5 & 0 \end{bmatrix}$, then find B satisfying $A \times B = A$

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

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

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

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

16. 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) $m \times o$ (ii) $n \times o$ (iii) $o \times m$ (iv) $m \times n$

17. If A = $\begin{bmatrix} 8 & 7 \\ 9 & 7 \end{bmatrix}$ and B = $\begin{bmatrix} 7 & 8 \\ 1 & 2 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} 135 & 60 \\ 82 & 35 \end{bmatrix}$ (ii) $\begin{bmatrix} 135 & 61 \\ 82 & 35 \end{bmatrix}$ (iii) $\begin{bmatrix} 132 & 60 \\ 82 & 35 \end{bmatrix}$ (iv) $\begin{bmatrix} 135 & 60 \\ 82 & 34 \end{bmatrix}$ (v) $\begin{bmatrix} 135 & 60 \\ 85 & 35 \end{bmatrix}$

18. If A = $\begin{bmatrix} 6 & 1 \\ 2 & 2 \end{bmatrix}$ and B = $\begin{bmatrix} 9 & 6 \\ 8 & 7 \end{bmatrix}$, find $A^2 - B^2$

(i) $\begin{bmatrix} -91 & -88 \\ -112 & -93 \end{bmatrix}$ (ii) $\begin{bmatrix} -91 & -87 \\ -112 & -91 \end{bmatrix}$ (iii) $\begin{bmatrix} -91 & -88 \\ -112 & -91 \end{bmatrix}$ (iv) $\begin{bmatrix} -91 & -88 \\ -113 & -91 \end{bmatrix}$ (v) $\begin{bmatrix} -91 & -88 \\ -110 & -91 \end{bmatrix}$

19. If A = $\begin{bmatrix} 5 & 6 \\ 1 & 2 \end{bmatrix}$ and B = $\begin{bmatrix} 4 & 8 \\ 5 & 9 \end{bmatrix}$, find $(A+B)^2$

(i) $\begin{bmatrix} 165 & 278 \\ 120 & 205 \end{bmatrix}$ (ii) $\begin{bmatrix} 165 & 280 \\ 120 & 205 \end{bmatrix}$ (iii) $\begin{bmatrix} 165 & 280 \\ 120 & 204 \end{bmatrix}$ (iv) $\begin{bmatrix} 165 & 280 \\ 120 & 206 \end{bmatrix}$ (v) $\begin{bmatrix} 165 & 280 \\ 122 & 205 \end{bmatrix}$

20. If A = $\begin{bmatrix} 9 & 5 \\ 2 & 6 \end{bmatrix}$ and B = $\begin{bmatrix} 6 & 6 \\ 5 & 8 \end{bmatrix}$, find $A^2 + B^2 + 2AB$

(i) $\begin{bmatrix} 315 & 344 \\ 184 & 260 \end{bmatrix}$ (ii) $\begin{bmatrix} 315 & 346 \\ 184 & 260 \end{bmatrix}$ (iii) $\begin{bmatrix} 315 & 350 \\ 184 & 260 \end{bmatrix}$ (iv) $\begin{bmatrix} 315 & 347 \\ 184 & 260 \end{bmatrix}$ (v) $\begin{bmatrix} 315 & 348 \\ 184 & 260 \end{bmatrix}$

21. If A = $\begin{bmatrix} 5 & 5 \\ 2 & 4 \end{bmatrix}$ and B = $\begin{bmatrix} 4 & 1 \\ 8 & 3 \end{bmatrix}$, find $(A-B)^2$

(i) $\begin{bmatrix} -23 & 8 \\ -12 & -23 \end{bmatrix}$ (ii) $\begin{bmatrix} -23 & 8 \\ -9 & -23 \end{bmatrix}$ (iii) $\begin{bmatrix} -24 & 8 \\ -12 & -23 \end{bmatrix}$ (iv) $\begin{bmatrix} -23 & 8 \\ -15 & -23 \end{bmatrix}$ (v) $\begin{bmatrix} -23 & 9 \\ -12 & -23 \end{bmatrix}$

22. If A = $\begin{bmatrix} 5 & 7 \\ 8 & 2 \end{bmatrix}$ and B = $\begin{bmatrix} 3 & 2 \\ 1 & 7 \end{bmatrix}$, find $A^2 + B^2 - 2AB$

(i) $\begin{bmatrix} 48 & -48 \\ 14 & 51 \end{bmatrix}$ (ii) $\begin{bmatrix} 48 & -50 \\ 14 & 51 \end{bmatrix}$ (iii) $\begin{bmatrix} 45 & -49 \\ 14 & 51 \end{bmatrix}$ (iv) $\begin{bmatrix} 48 & -49 \\ 14 & 51 \end{bmatrix}$ (v) $\begin{bmatrix} 50 & -49 \\ 14 & 51 \end{bmatrix}$

23. Which of the following are true ?

a) If A X B is possible, the no of cols in A must be equal to no of cols in B
b) If A X B is possible, the no of rows in A must be equal to no of cols in B
c) If A X B is possible, the no of rows in A must be equal to no of rows in B
d) If A X B is possible, the no of cols in A must be equal to no of rows in B

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

24. If A = $\begin{bmatrix} 1 & (-2) \end{bmatrix}$, B = $\begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} (x-2y) & (x-2y) \end{bmatrix}$ (ii) $\begin{bmatrix} (x-2y) \\ (x-2y) \end{bmatrix}$ (iii) $\begin{bmatrix} x & y \\ (-2x) & (-2y) \end{bmatrix}$ (iv) $\begin{bmatrix} x & (-2x) \\ y & (-2y) \end{bmatrix}$

(v) $\begin{bmatrix} (x-2y) \end{bmatrix}$

25. If A = $\begin{bmatrix} 5 & 6 \\ 6 & -3 \end{bmatrix}$ and B = $\begin{bmatrix} 6 & 0 \\ 9 & -6 \end{bmatrix}$ and D = $\begin{bmatrix} 66 & 150 \\ -26 & -16 \end{bmatrix}$,

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

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

26. If A = $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$, B = $\begin{bmatrix} 0 & -5 \\ 3 & 1 \end{bmatrix}$ and C = $\begin{bmatrix} 21 & 7 \\ 18 & -14 \end{bmatrix}$

and $(A \times B) = C$, find A

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

27. If B = $\begin{bmatrix} 6 & 9 \\ 4 & 2 \end{bmatrix}$ and C = $\begin{bmatrix} 34 & 35 \\ 36 & 42 \end{bmatrix}$ and $(A \times B) = C$, find A

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

28. If B = $\begin{bmatrix} 9 & 6 \\ 6 & 9 \end{bmatrix}$ and C = $\begin{bmatrix} 27 & 33 \end{bmatrix}$ and $(A \times B) = C$, find A

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

29. Given A = $\begin{bmatrix} 3 & -7 \\ 6 & 2 \end{bmatrix}$ find B such that AB = BA = A

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

30. Find X if A = $\begin{bmatrix} 3 & 2 \\ -1 & -5 \end{bmatrix}$, AX = B and B = $\begin{bmatrix} -18 & 25 \\ 32 & -4 \end{bmatrix}$

(i) $\begin{bmatrix} -2 & 6 \\ -6 & -1 \end{bmatrix}$ (ii) $\begin{bmatrix} -2 & 9 \\ -6 & -2 \end{bmatrix}$ (iii) $\begin{bmatrix} -2 & 9 \\ -6 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} -2 & 9 \\ -5 & -1 \end{bmatrix}$ (v) $\begin{bmatrix} -2 & 12 \\ -6 & -1 \end{bmatrix}$

31. Given A = $\begin{bmatrix} 1 & 5 \\ 1 & 4 \end{bmatrix}$ and B = $\begin{bmatrix} 43 \\ 34 \end{bmatrix}$,

find P such that AP = B

(i) $\begin{bmatrix} -3 \\ 9 \end{bmatrix}$ (ii) $\begin{bmatrix} -1 \\ 9 \end{bmatrix}$ (iii) $\begin{bmatrix} -2 \\ 9 \end{bmatrix}$ (iv) $\begin{bmatrix} -2 \\ 11 \end{bmatrix}$ (v) $\begin{bmatrix} -2 \\ 6 \end{bmatrix}$

32. Given A = $\begin{bmatrix} 0 & 2 & -2 \\ -1 & 1 & -2 \\ 2 & -1 & 0 \end{bmatrix}$ and B = $\begin{bmatrix} -4 \\ -2 \\ 5 \end{bmatrix}$,

find P such that AP = B

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

Assignment Key

1) (iv)	2) (i)	3) (ii)	4) (v)	5) (ii)	6) (i)
7) (i)	8) (iii)	9) (iv)	10) (iii)	11) (iii)	12) (i)
13) (i)	14) (iv)	15) (iii)	16) (i)	17) (i)	18) (iii)
19) (ii)	20) (iv)	21) (i)	22) (iv)	23) (iii)	24) (v)
25) (iv)	26) (v)	27) (i)	28) (i)	29) (iv)	30) (iii)
31) (iii)	32) (v)				