EduSahara™ Assignment

Name : Matrix Multiplication

Chapter : Matrices

Grade : ICSE Grade X

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1. If $A = \begin{bmatrix} 3 & -1 \\ -3 & -8 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 \\ 5 & -8 \end{bmatrix}$, then $A \times B =$

(i) $\begin{bmatrix} 4 & 3 \\ -49 & 70 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 2 \\ -46 & 70 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 & 2 \\ -51 & 70 \end{bmatrix}$ (iv) $\begin{bmatrix} 4 & 2 \\ -50 & 70 \end{bmatrix}$ (v) $\begin{bmatrix} 4 & 2 \\ -49 & 70 \end{bmatrix}$

2. Which of the following is an identity matrix ?

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

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

(i) $\begin{bmatrix} 7 & 8 & 18 \\ -1 & 0 & 12 \\ -10 & -8 & 6 \end{bmatrix}$ (ii) $\begin{bmatrix} 7 & 9 & 18 \\ -1 & 2 & 12 \\ -10 & -8 & 6 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & 9 & 18 \\ -1 & 0 & 12 \\ -10 & -8 & 6 \end{bmatrix}$ (iv) $\begin{bmatrix} 7 & 9 & 15 \\ -1 & 0 & 12 \\ -10 & -8 & 6 \end{bmatrix}$ (v) $\begin{bmatrix} 7 & 10 & 18 \\ -1 & 0 & 12 \\ -10 & -8 & 6 \end{bmatrix}$

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

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

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

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

6. If $A = \begin{bmatrix} 3 & -2 & -3 \\ -3 & -1 & 0 \\ -1 & -3 & 0 \end{bmatrix}$, then $10A =$

(i) $\begin{bmatrix} 30 & -20 & -30 \\ -30 & -10 & 0 \\ -10 & -30 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 30 & -20 & -30 \\ -30 & -10 & 0 \\ -10 & -28 & 0 \end{bmatrix}$ (iii) $\begin{bmatrix} 30 & -20 & -32 \\ -30 & -10 & 0 \\ -10 & -30 & 0 \end{bmatrix}$ (iv) $\begin{bmatrix} 30 & -20 & -30 \\ -30 & -9 & 0 \\ -10 & -30 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} 30 & -20 & -30 \\ -30 & -10 & -1 \\ -10 & -30 & 0 \end{bmatrix}$

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

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

(i) $\begin{bmatrix} -8 & 14 \\ -9 & 10 \end{bmatrix}$ (ii) $\begin{bmatrix} -8 & 14 \\ -10 & 12 \end{bmatrix}$ (iii) $\begin{bmatrix} -8 & 14 \\ -13 & 10 \end{bmatrix}$ (iv) $\begin{bmatrix} -8 & 13 \\ -10 & 10 \end{bmatrix}$ (v) $\begin{bmatrix} -8 & 14 \\ -10 & 10 \end{bmatrix}$

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

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

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

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

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

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

10. If $A = \begin{bmatrix} 8 & 9 \\ -2 & -9 \end{bmatrix}$ and $C = \begin{bmatrix} 4 \\ -28 \end{bmatrix}$,

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

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

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

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

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

12. If $A = \begin{bmatrix} -8 & 0 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -8 & -4 \\ 9 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} -7 & -3 \\ -4 & 3 \end{bmatrix}$,

then compute $A^2 + BC =$

(i) $\begin{bmatrix} 136 & 12 \\ -91 & -12 \end{bmatrix}$ (ii) $\begin{bmatrix} 138 & 12 \\ -91 & -12 \end{bmatrix}$ (iii) $\begin{bmatrix} 136 & 12 \\ -90 & -12 \end{bmatrix}$ (iv) $\begin{bmatrix} 136 & 12 \\ -93 & -12 \end{bmatrix}$ (v) $\begin{bmatrix} 136 & 11 \\ -91 & -12 \end{bmatrix}$

13. If $A = \begin{bmatrix} 0 & 4 \\ -2 & -1 \end{bmatrix}$, then find AI

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

14. If $A = \begin{bmatrix} 2 & 2 \\ 6 & -8 \end{bmatrix}$, then find B satisfying $A \times B = A$

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

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

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

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

17. If $A = \begin{bmatrix} 3 & 6 \\ 4 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ 1 & 5 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} 34 & 12 \\ 40 & 15 \end{bmatrix}$ (ii) $\begin{bmatrix} 33 & 12 \\ 40 & 15 \end{bmatrix}$ (iii) $\begin{bmatrix} 35 & 12 \\ 40 & 18 \end{bmatrix}$ (iv) $\begin{bmatrix} 35 & 12 \\ 40 & 15 \end{bmatrix}$ (v) $\begin{bmatrix} 35 & 12 \\ 41 & 15 \end{bmatrix}$

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

(i) $\begin{bmatrix} -29 & -3 \\ -32 & -61 \end{bmatrix}$ (ii) $\begin{bmatrix} -28 & 0 \\ -32 & -61 \end{bmatrix}$ (iii) $\begin{bmatrix} -29 & 0 \\ -29 & -61 \end{bmatrix}$ (iv) $\begin{bmatrix} -30 & 0 \\ -32 & -61 \end{bmatrix}$ (v) $\begin{bmatrix} -29 & 0 \\ -32 & -61 \end{bmatrix}$

19. If $A = \begin{bmatrix} 9 & 1 \\ 1 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 4 \\ 9 & 8 \end{bmatrix}$, find $(A+B)^2$

(i) $\begin{bmatrix} 246 & 145 \\ 293 & 275 \end{bmatrix}$ (ii) $\begin{bmatrix} 246 & 145 \\ 290 & 273 \end{bmatrix}$ (iii) $\begin{bmatrix} 245 & 145 \\ 290 & 275 \end{bmatrix}$ (iv) $\begin{bmatrix} 246 & 145 \\ 291 & 275 \end{bmatrix}$ (v) $\begin{bmatrix} 246 & 145 \\ 290 & 275 \end{bmatrix}$

20. If $A = \begin{bmatrix} 2 & 5 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 8 \\ 3 & 3 \end{bmatrix}$, find $A^2 + B^2 + 2AB$

(i) $\begin{bmatrix} 115 & 158 \\ 137 & 210 \end{bmatrix}$ (ii) $\begin{bmatrix} 115 & 155 \\ 137 & 210 \end{bmatrix}$ (iii) $\begin{bmatrix} 115 & 158 \\ 140 & 210 \end{bmatrix}$ (iv) $\begin{bmatrix} 115 & 158 \\ 136 & 210 \end{bmatrix}$ (v) $\begin{bmatrix} 115 & 158 \\ 138 & 210 \end{bmatrix}$

21. If $A = \begin{bmatrix} 4 & 3 \\ 2 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 7 \\ 3 & 5 \end{bmatrix}$, find $(A-B)^2$

(i) $\begin{bmatrix} 4 & -8 \\ -2 & 11 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & -8 \\ -2 & 8 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 & -8 \\ -2 & 7 \end{bmatrix}$ (iv) $\begin{bmatrix} 5 & -8 \\ -2 & 8 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & -8 \\ -2 & 8 \end{bmatrix}$

22. If $A = \begin{bmatrix} 2 & 2 \\ 8 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 9 \\ 5 & 8 \end{bmatrix}$, find $A^2 + B^2 - 2AB$

(i) $\begin{bmatrix} 45 & 48 \\ 5 & -47 \end{bmatrix}$ (ii) $\begin{bmatrix} 45 & 48 \\ 7 & -47 \end{bmatrix}$ (iii) $\begin{bmatrix} 45 & 48 \\ 8 & -47 \end{bmatrix}$ (iv) $\begin{bmatrix} 45 & 48 \\ 8 & -46 \end{bmatrix}$ (v) $\begin{bmatrix} 48 & 48 \\ 8 & -47 \end{bmatrix}$

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

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

24. If $A = \begin{bmatrix} (-4) & (-9) \end{bmatrix}$, $B = \begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} (-4x-9y) \end{bmatrix}$ (ii) $\begin{bmatrix} (-4x) & (-4y) \\ (-9x) & (-9y) \end{bmatrix}$ (iii) $\begin{bmatrix} (-4x-9y) & (-4x-9y) \end{bmatrix}$ (iv) $\begin{bmatrix} (-4x-9y) \\ (-4x-9y) \end{bmatrix}$

(v) $\begin{bmatrix} (-4x) & (-9x) \\ (-4y) & (-9y) \end{bmatrix}$

25. If $A = \begin{bmatrix} -2 & 7 \\ 7 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 2 \\ 9 & -2 \end{bmatrix}$ and $D = \begin{bmatrix} -88 & -44 \\ 35 & 20 \end{bmatrix}$,
$6A - 3B + 10C = D$, then $C = ?$

(i) $\begin{bmatrix} -7 & -7 \\ 2 & -1 \end{bmatrix}$ (ii) $\begin{bmatrix} -8 & -8 \\ 2 & -1 \end{bmatrix}$ (iii) $\begin{bmatrix} -7 & -11 \\ 2 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 & -8 \\ 2 & -1 \end{bmatrix}$ (v) $\begin{bmatrix} -7 & -8 \\ 2 & -1 \end{bmatrix}$

26. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, $B = \begin{bmatrix} -9 & 7 \\ 2 & -2 \end{bmatrix}$ and $C = \begin{bmatrix} 76 & -60 \\ 46 & -38 \end{bmatrix}$
and $(A \times B) = C$, find A

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

27. If $B = \begin{bmatrix} 2 & 4 \\ 1 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 15 & 45 \\ 23 & 67 \end{bmatrix}$ and $(A \times B) = C$, find A

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

28. If $B = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 47 & 27 \end{bmatrix}$ and $(A \times B) = C$, find A

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

29. Given $A = \begin{bmatrix} 4 & 3 \\ 4 & -6 \end{bmatrix}$ find B such that AB = BA = A

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

30. Find X if $A = \begin{bmatrix} -6 & 8 \\ -1 & -8 \end{bmatrix}$, AX = B and $B = \begin{bmatrix} 74 & 30 \\ -53 & -51 \end{bmatrix}$

(i) $\begin{bmatrix} -3 & 3 \\ 6 & 6 \end{bmatrix}$ (ii) $\begin{bmatrix} -3 & 3 \\ 4 & 6 \end{bmatrix}$ (iii) $\begin{bmatrix} -3 & 3 \\ 7 & 6 \end{bmatrix}$ (iv) $\begin{bmatrix} -3 & 3 \\ 8 & 6 \end{bmatrix}$ (v) $\begin{bmatrix} -3 & 3 \\ 10 & 6 \end{bmatrix}$

31. Given $A = \begin{bmatrix} -3 & 7 \\ 7 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -6 \\ 14 \end{bmatrix}$,

find P such that AP = B

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

32. Given $A = \begin{bmatrix} 3 & -1 & -4 \\ 1 & 3 & -1 \\ 0 & 3 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 22 \\ -4 \\ 7 \end{bmatrix}$,

find P such that AP = B

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

Assignment Key

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

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