EduSahara™ Assignment

Name : Matrix Multiplication

Chapter : Matrices

Grade : ICSE Grade X

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1. If $A = \begin{bmatrix} -9 & -6 \\ 9 & -8 \end{bmatrix}$ and $B = \begin{bmatrix} -6 & -6 \\ 1 & 2 \end{bmatrix}$, then $A \times B =$

(i) $\begin{bmatrix} 48 & 42 \\ -62 & -70 \end{bmatrix}$ (ii) $\begin{bmatrix} 48 & 42 \\ -62 & -68 \end{bmatrix}$ (iii) $\begin{bmatrix} 48 & 42 \\ -62 & -69 \end{bmatrix}$ (iv) $\begin{bmatrix} 48 & 42 \\ -63 & -70 \end{bmatrix}$ (v) $\begin{bmatrix} 48 & 39 \\ -62 & -70 \end{bmatrix}$

2. Which of the following is an identity matrix ?

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

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

(i) $\begin{bmatrix} -9 & 1 & 0 \\ -13 & -4 & -1 \\ -8 & -2 & 5 \end{bmatrix}$ (ii) $\begin{bmatrix} -9 & 1 & 0 \\ -13 & -4 & 0 \\ -8 & -1 & 5 \end{bmatrix}$ (iii) $\begin{bmatrix} -9 & 1 & 0 \\ -16 & -4 & 0 \\ -8 & -2 & 5 \end{bmatrix}$ (iv) $\begin{bmatrix} -9 & 1 & 0 \\ -13 & -2 & 0 \\ -8 & -2 & 5 \end{bmatrix}$ (v) $\begin{bmatrix} -9 & 1 & 0 \\ -13 & -4 & 0 \\ -8 & -2 & 5 \end{bmatrix}$

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

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

5. If $A = \begin{bmatrix} 4 & 3 & 1 \\ -4 & -3 & -1 \\ 2 & 4 & 0 \end{bmatrix}$, then $A^2 =$

(i) $\begin{bmatrix} 6 & 7 & 1 \\ -6 & -10 & -1 \\ -8 & -6 & -2 \end{bmatrix}$ (ii) $\begin{bmatrix} 6 & 7 & 1 \\ -5 & -7 & -1 \\ -8 & -6 & -2 \end{bmatrix}$ (iii) $\begin{bmatrix} 6 & 7 & 1 \\ -6 & -7 & -1 \\ -8 & -6 & -2 \end{bmatrix}$ (iv) $\begin{bmatrix} 6 & 7 & 1 \\ -6 & -7 & -1 \\ -9 & -6 & -2 \end{bmatrix}$ (v) $\begin{bmatrix} 6 & 7 & 1 \\ -4 & -7 & -1 \\ -8 & -6 & -2 \end{bmatrix}$

6. If $A = \begin{bmatrix} -2 & 0 & -4 \\ 4 & 1 & -3 \\ 3 & -3 & 2 \end{bmatrix}$, then $8A =$

(i) $\begin{bmatrix} -16 & 0 & -32 \\ 32 & 8 & -24 \\ 24 & -24 & 17 \end{bmatrix}$ (ii) $\begin{bmatrix} -16 & 0 & -33 \\ 32 & 8 & -24 \\ 24 & -24 & 16 \end{bmatrix}$ (iii) $\begin{bmatrix} -16 & 0 & -32 \\ 32 & 8 & -24 \\ 24 & -24 & 16 \end{bmatrix}$ (iv) $\begin{bmatrix} -16 & -3 & -32 \\ 32 & 8 & -24 \\ 24 & -24 & 16 \end{bmatrix}$ (v) $\begin{bmatrix} -16 & 0 & -32 \\ 35 & 8 & -24 \\ 24 & -24 & 16 \end{bmatrix}$

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

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

8. If $A = \begin{bmatrix} 2 & 1 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 \\ -1 & -2 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 2 \\ 1 & -1 \end{bmatrix}$,
then $(A \times B) + C =$

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

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

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

10. If $A = \begin{bmatrix} -7 & 9 \\ -9 & -1 \end{bmatrix}$ and $C = \begin{bmatrix} 95 \\ 9 \end{bmatrix}$,
find a matrix B satisfying $A \times B = C$

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

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

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

12. If $A = \begin{bmatrix} 0 & 3 \\ -7 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 7 & 4 \\ 0 & -6 \end{bmatrix}$ and $C = \begin{bmatrix} 4 & -7 \\ -8 & -3 \end{bmatrix}$,
then compute $A^2 + BC =$

(i) $\begin{bmatrix} -25 & -49 \\ 20 & 14 \end{bmatrix}$ (ii) $\begin{bmatrix} -25 & -49 \\ 20 & 10 \end{bmatrix}$ (iii) $\begin{bmatrix} -23 & -49 \\ 20 & 13 \end{bmatrix}$ (iv) $\begin{bmatrix} -25 & -49 \\ 19 & 13 \end{bmatrix}$ (v) $\begin{bmatrix} -25 & -49 \\ 20 & 13 \end{bmatrix}$

13. If $A = \begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$, then find AI

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

14. If $A = \begin{bmatrix} -2 & 9 \\ 2 & -3 \end{bmatrix}$, then find B satisfying $A \times B = A$

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

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

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

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

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

17. If $A = \begin{bmatrix} 5 & 1 \\ 6 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 8 \\ 4 & 4 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} 18 & -43 \\ 22 & -35 \end{bmatrix}$ (ii) $\begin{bmatrix} 18 & -42 \\ 22 & -37 \end{bmatrix}$ (iii) $\begin{bmatrix} 16 & -43 \\ 22 & -37 \end{bmatrix}$ (iv) $\begin{bmatrix} 18 & -43 \\ 22 & -37 \end{bmatrix}$ (v) $\begin{bmatrix} 17 & -43 \\ 22 & -37 \end{bmatrix}$

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

(i) $\begin{bmatrix} 18 & 41 \\ 63 & 136 \end{bmatrix}$ (ii) $\begin{bmatrix} 21 & 40 \\ 63 & 136 \end{bmatrix}$ (iii) $\begin{bmatrix} 21 & 41 \\ 64 & 136 \end{bmatrix}$ (iv) $\begin{bmatrix} 21 & 43 \\ 63 & 136 \end{bmatrix}$ (v) $\begin{bmatrix} 21 & 41 \\ 63 & 136 \end{bmatrix}$

19. If $A = \begin{bmatrix} 6 & 8 \\ 9 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 9 & 3 \\ 1 & 9 \end{bmatrix}$, find $(A+B)^2$

(i) $\begin{bmatrix} 335 & 352 \\ 320 & 398 \end{bmatrix}$ (ii) $\begin{bmatrix} 335 & 352 \\ 317 & 399 \end{bmatrix}$ (iii) $\begin{bmatrix} 335 & 352 \\ 320 & 399 \end{bmatrix}$ (iv) $\begin{bmatrix} 335 & 353 \\ 320 & 399 \end{bmatrix}$ (v) $\begin{bmatrix} 335 & 352 \\ 322 & 399 \end{bmatrix}$

20. If $A = \begin{bmatrix} 5 & 8 \\ 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 4 \\ 8 & 5 \end{bmatrix}$, find $A^2 + B^2 + 2AB$

(i) $\begin{bmatrix} 233 & 196 \\ 104 & 116 \end{bmatrix}$ (ii) $\begin{bmatrix} 232 & 196 \\ 102 & 116 \end{bmatrix}$ (iii) $\begin{bmatrix} 233 & 196 \\ 102 & 117 \end{bmatrix}$ (iv) $\begin{bmatrix} 233 & 196 \\ 100 & 116 \end{bmatrix}$ (v) $\begin{bmatrix} 233 & 196 \\ 102 & 116 \end{bmatrix}$

21. If $A = \begin{bmatrix} 2 & 8 \\ 4 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 9 \\ 4 & 7 \end{bmatrix}$, find $(A-B)^2$

(i) $\begin{bmatrix} 9 & 4 \\ 0 & 1 \end{bmatrix}$ (ii) $\begin{bmatrix} 10 & 4 \\ 0 & 1 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 4 \\ -1 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} 9 & 4 \\ 3 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & 1 \\ 0 & 1 \end{bmatrix}$

22. If $A = \begin{bmatrix} 2 & 1 \\ 2 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 5 \\ 9 & 3 \end{bmatrix}$, find $A^2 + B^2 - 2AB$

(i) $\begin{bmatrix} 33 & 19 \\ -77 & 53 \end{bmatrix}$ (ii) $\begin{bmatrix} 33 & 19 \\ -77 & 52 \end{bmatrix}$ (iii) $\begin{bmatrix} 30 & 19 \\ -77 & 52 \end{bmatrix}$ (iv) $\begin{bmatrix} 33 & 19 \\ -75 & 52 \end{bmatrix}$ (v) $\begin{bmatrix} 33 & 18 \\ -77 & 52 \end{bmatrix}$

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

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

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24. If $A = \begin{bmatrix} 1 & 8 \end{bmatrix}$, $B = \begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} (x+8y) & (x+8y) \end{bmatrix}$ (ii) $\begin{bmatrix} (x+8y) \\ (x+8y) \end{bmatrix}$ (iii) $\begin{bmatrix} (x+8y) \end{bmatrix}$ (iv) $\begin{bmatrix} x & y \\ 8x & 8y \end{bmatrix}$ (v) $\begin{bmatrix} x & 8x \\ y & 8y \end{bmatrix}$

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25. If $A = \begin{bmatrix} -6 & 0 \\ 4 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} -9 & 7 \\ -7 & 1 \end{bmatrix}$ and $D = \begin{bmatrix} 45 & -63 \\ 87 & -51 \end{bmatrix}$,
$10A - 9B + 8C = D$, then C = ?

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

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26. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, $B = \begin{bmatrix} 9 & -3 \\ -2 & -3 \end{bmatrix}$ and $C = \begin{bmatrix} 5 & 24 \\ -7 & 6 \end{bmatrix}$
and $(A \times B) = C$, find A

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

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27. If $B = \begin{bmatrix} 2 & 4 \\ 8 & 8 \end{bmatrix}$ and $C = \begin{bmatrix} 62 & 68 \\ 58 & 68 \end{bmatrix}$ and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 3 & 7 \\ 5 & 6 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 7 \\ 5 & 6 \end{bmatrix}$ (iii) $\begin{bmatrix} 3 & 7 \\ 4 & 6 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & 7 \\ 5 & 6 \end{bmatrix}$ (v) $\begin{bmatrix} 3 & 7 \\ 5 & 8 \end{bmatrix}$

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28. If $B = \begin{bmatrix} 9 & 3 \\ 5 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 38 & 22 \end{bmatrix}$ and $(A \times B) = C$, find A

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

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29. Given $A = \begin{bmatrix} 9 & -4 \\ 4 & 4 \end{bmatrix}$ find B such that AB = BA = A

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

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30. Find X if $A = \begin{bmatrix} 3 & -5 \\ -5 & -6 \end{bmatrix}$, AX = B and $B = \begin{bmatrix} 62 & -20 \\ -3 & -24 \end{bmatrix}$

(i) $\begin{bmatrix} 9 & 1 \\ -7 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 9 & -1 \\ -7 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 0 \\ -7 & 4 \end{bmatrix}$ (iv) $\begin{bmatrix} 9 & 0 \\ -9 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} 12 & 0 \\ -7 & 4 \end{bmatrix}$

31. Given $A = \begin{bmatrix} 4 & 5 \\ 9 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} -16 \\ 6 \end{bmatrix}$,

find P such that AP = B

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

32. Given $A = \begin{bmatrix} -2 & 4 & 3 \\ 0 & 3 & -1 \\ 1 & 3 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -9 \\ -10 \\ -6 \end{bmatrix}$,

find P such that AP = B

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

Assignment Key

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

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