MATHS

BOOKS - JEE MAINS PREVIOUS YEAR

MATRICES

Others

1. Let A be a 2×2 matrix with real entries. Let I be the 2×2 identity matrix. Denote by tr (A), the sum of diagonal entries of A. Assume that

$A^2 = I$. Statement 1: If $A \neq I$ and $A \neq -I$, then det $A = -1$. Statement 2: If $A \neq I$ and $A \neq -I$, then $tr(A) \neq 0$.

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2. Let A be a square matrix all of whose entries are integers. Then which one of the following is true? (1) If $detA = \pm 1, thenA^1$ exists but all its entries are not necessarily integers (2) If $detA \neq \pm 1, thenA^1$ exists and all its entries are non-integers (3) If $detA = \pm 1, thenA^1$

exists and all its entries are integers (4) If $detA = \pm 1, thenA^1$ need not exist

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3. Let A be a 2×2 matrix with non-zero entries and let $A^2 = I$, where I is 2×2 identity matrix. Define Tr(A) = sum of diagonal elements of A and |A| = determinant of matrix A. Statement-1: $Tr(A) = 0$ Statement-2: $|A| = 1$ (1) Statement-1 is true, Statement-2 is true; Statement-2 is not the correct

explanation for Statement-1 (2) Statement-1 is true, Statement-2 is false (3) Statement-1 is false, Statement-2 is true (4) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation for Statement-1

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4. Let A and B be two symmetric matrices of order 3. Statement-1 : A(BA) and (AB)A are symmetric matrices. Statement-2 : AB is symmetric matrix if matrix multiplication of A

with B is commutative. Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1. Statement-1 is true, Statement-2 is true; Statement-2 is true; Statement-2 is not a correct explanation for Statement-1. Statement-1 is true, Statement-2 is false. Statement-1 is false, Statement-2 is true.

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5. Let P and Q be 3×3 matrices with $P \neq Q$.

If $P^3 = Q^3 and P^2 Q = Q^2 P,$ then determinant of $\left(P^2 + Q^2\right)$ is equal to (1) 2(2) 1 (3)0 (4) 1

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