

Today's IIScian Approach

Q If $A_{n \times n}$ real matrix such that
 $A^2 + I = O_{n \times n}$ then n can be odd.
 (True | False).

Sol :-

How to

THINK

First recall some basic facts:-

- $A^2 = A \cdot A$
- $\det(A^2) = (\det A)^2$, in fact $\det(A^k) = (\det A)^k$.
- Here $A^2 + I = O_{n \times n} \Rightarrow A^2 = -I$.
- $\det(A^2) = \det(-I) = (-1)^n$
- $(\det A)^2 = (-1)^n$
- Since A is real matrix $\Rightarrow \det A$ is real.
(WHY??)
- Thus $(\det A)^2 \geq 0 \Rightarrow (-1)^n \geq 0$
- Hence n must be even.
- So n can NOT be odd. Proved.

NET December : Regular Batch 13th July , Weekend Batch - 15th July.

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