Key Takeaways

Symmetric and skew symmetric Matrix:

All odd positive integral power of a skew – symmetric matrix is a skew – symmetric matrix.

All even positive integral power of a skew – symmetric matrix is a symmetric matrix.

Proof:

$A = -A^T$

Let $C = A^n, n \in N$

$C^T = (A^n)^T = A^T A^T \dots A^T$ (up to n times)

$C^T = (-A)(-A) \dots (-A)$ (up to n times) $= (-1)^n A^n$

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