Key Takeaways

Symmetric and skew symmetric Matrix:

All positive integral power of a symmetric matrix is a symmetric matrix.

Proof:

$A = A^T$

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

$B^T = (A^n)^T$

$B^T = A^T A^T \ldots A^T$ (up to n times)

$B^T = AA \ldots A$ (up to n times) $= A^n$

$B^T = B \Rightarrow (A^n)^T = A^n \Rightarrow$ symmetric matrix

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