

HOMEWORK 10.

Due Friday, December 2, in class.

1. Prove or disprove: Every matrix $A \in M_{n \times n}(\mathbb{C})$ has a square root.
2. Prove: if every eigenvalue of a matrix $A \in M_{n \times n}(\mathbb{C})$ is strictly less than 1 in absolute value, then $A^n \rightarrow 0$ as $n \rightarrow \infty$. (A sequence $\{T_n\}$ of matrices converges to 0 if, for all i, j , $(T_n)_{ij} \rightarrow 0$.)
3. Do Problem 6 in Section 6.5.
4. Do Problem 4 (b), (c) in Section 7.2.
5. Do Problem 5 (b), (e), and (f) in Section 7.2.