

Math 469 HW #9
Due 11:00 PM Sunday, Apr. 12

Assume all vector spaces are finite-dimensional.

1. (Axler Problem 8.C.6) Give an example of an operator on \mathbb{C}^4 whose characteristic polynomial equals $z(z - 1)^2(z - 3)$ and whose minimal polynomial equals $z(z - 1)(z - 3)$.
2. (Axler Problem 8.C.8) Suppose $T \in \mathcal{L}(V)$. Prove T is invertible if and only if the constant term in the minimal polynomial of T is nonzero.
3. (Axler Problem 9.A.16) Suppose V is a real vector space. Prove that there exists $T \in \mathcal{L}(V)$ such that $T^2 = -I$ if and only if V has even dimension.