

Proof E and D-1

Accepted

Not Accepted

I affirm this work abides by the university's Academic Honesty Policy.

Print Name, then Sign

- First due date **Thursday, November 19**.
- *** You **may** discuss this problem with others but may not discuss how to write it up or show others your written work.
- Turn in your work on a separate sheet of paper with this page stapled in front.
- Do not include scratch work in your submission.
- There is to be **no collaboration** on any aspect of developing and presenting your proof. Your only resources are: you, the course textbook, me, and pertinent discussions that occur **during class**.
- Follow the Writing Guidelines of the Grading Rubric.
(http://math.ups.edu/~bryans/Current/Fall.2008/290inf_Fall2008.html#tth_sEc5.1)
- Retry: Only use material from the relevant section or earlier.
- Retry: Start over using a new sheet of paper.
- Retry: Restaple with new attempts first and this page on top.

“Personally, I’m always ready to learn, although I do not always like being taught.” – Winston Churchill

E and D-1 (You may use material up through Section SD)

1. Suppose A is a square matrix where $A^4 = O$. That is, A^4 is the zero matrix.
 - (a) Prove that zero is the only eigenvalue of A .
 - (b) Give an example of a 4×4 matrix A where $A^4 = O$ but $A^3 \neq O$.
 2. Suppose B is a nonsingular matrix for which $B^* = B^{-1}$.
 - (a) Prove that $\det(B)$ must be a complex number of modulus 1.
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