

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 20**.
- 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)

Suppose A is a square matrix where $A^4 = O$. That is, A^4 is the zero matrix.

1. Prove that zero is the only eigenvalue of A .
2. Give an example of a 4×4 matrix A where $A^4 = O$ but $A^3 \neq O$.

Notes

1. It is useful to remember the relationship between eigenvalues of A and eigenvalues of A^m .
 2. Note that $B = \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$ is not the zero matrix but that $B^2 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$.
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