

MATH 253

Today

1. Review for exam.

Review Material

1. All material, all semester. Old material plus:
2. State and prove the Rank-Nullity Theorem for linear transformations. (Pre-notes.)
3. Gram-Schmidt Orthogonalization (3 steps)
4. Inner product spaces
5. Eigenvalues and eigenvectors, the characteristic polynomial
6. Page rank
7. Symmetric and hermitian matrices
8. Orthogonal and unitary matrices
9. Diagonalizability
10. Schur's Theorem
11. Orthogonally similar
12. The Cayley-Hamilton Theorem
13. The minimum polynomial
14. Jordan Canonical Form

Logistics:

1. The exam is intended to be a two-hour exam.
2. There will be three or four (short) proofs. The rest will be computational or conceptual.

3. You may use a calculator or Python, but I may ask you explicitly to perform some computations by hand (e.g., the Gram-Schmidt process).
4. For Python, you may start with the basic template I've shared. You may also use your Python info sheet.
5. Problems will be on one page. I will provide blank paper for you to work on. Please leave the upper left corner blank (for a staple) and write on only one side of the page.
6. I will ask you to begin by stating and proving the Rank-Nullity Theorem for linear transformations as your first problem. After you turn that in, I will give you the rest of the exam.
7. You may bring one 8.5"x11" sheet of paper for notes. You may use both sides. Note: this is only available to you after the Rank-Nullity Theorem, so feel free to put R-N on it.

Next Time

1. Exam!