

FINAL EXAM CONCEPTUAL REVIEW

EXAM DETAILS

The final exam is *cumulative*, but there will be an emphasis on the material since Midterm 02. This conceptual review is meant to cover that material. For topics from earlier in the semester, review the previous conceptual reviews, which are posted on the course website

Length 07-09 problems, many with multiple parts.

Material §3.1, §3.2, §2.5

Aids **Two** standard-sized (3×5 inch) notecards are allowed, but **no calculators are allowed**.

RANK, ELEMENTARY MATRICES, INVERTIBILITY

- (1) What is an elementary matrix? Can you quickly invert such a matrix, even if it is large?
- (2) What is the rank of a matrix?
- (3) How do elementary row/column operations affect rank? **3.2: 2**
- (4) What does rank have to do with invertibility?
- (5) How do you compare the rank of a matrix and its transpose?
- (6) How do you compute the inverse of a matrix using row ops? **3.2: 5**
- (7) How do you write down an explicit formula for the inverse of a linear transformation? **3.2: 6acef**
- (8) What is the relationship between invertibility and being a product of elementary matrices? More precisely, given an invertible matrix, can you factor it into a product of elementary matrices? **3.2: 7**

CHANGE OF COORDINATES

- (1) What is the change of coordinate basis matrix from an ordered basis of a vector space to another ordered basis? **Section 2.5: 2bcd, 3cd Group Quiz 07**
- (2) How can you use this to describe a linear transformation in terms of multiple bases? **Section 2.5: 4, 5 Group Quiz 07**

TRUE OF FALSE

I recommend that you take a look at Problem 1 from each of the sections that we covered. These are short, often one-word answers, that test your grasp of concepts.