

Study Guide for Exam 2

In what follows is a **brief** synopsis of what we have covered in Sections 1.7, 2.1, 2.3, 2.4, 2.7, 2.8. Use this list a guide to help you make up your own study guide.

On the exam, you can expect several proofs, TRUE/FALSE questions, and give-an-example-of type questions. The problems that have been assigned in class (but not necessarily collected) or very similar problems could appear on the exam; therefore it is **highly** recommended that you make every effort to complete those problems. In addition, you might try the problems listed below in the Chapter 1 & 2 Review Sections. Please note that these problems are mostly computational in nature (so not representative of a proof that might appear on the exam).

Chapter 1 Review, pp. 79–81: 13–17, 60, 61, 64, 65, 73

Chapter 2 Review, pp. 172–174: 4–21, 23, 30, 31, 38, 39, 45, 46, 50, 54, 55, 58, 60, 63, 64, 66–69, 73

To prepare for this test, you should make sure that you have done each of the following:

- **Rewritten your class notes.** Anything that I asked you to finish, make sure you know how to finish it. You should understand all of the proofs and be able to apply the techniques used in class to similar problems.
- **Tried all of the homework problems,** even the ones that are not collected. Just because a problem was not collected does NOT mean that it is unimportant. Similar questions could appear on the exam.

Exam 2 Topics:

1. Linear dependence and linear independence.
2. Equivalent conditions for the columns of a matrix A to be linearly independent (Theorem 1.8).
3. Matrix multiplication and properties of matrix multiplication (Theorem 2.1).
4. Invertible matrices, elementary matrices, properties of invertible matrices (Theorem 2.2).
5. Relationship between elementary matrices and the reduced row echelon form of a matrix (Theorem 2.3).
6. Equivalent conditions for a matrix to be invertible (Theorem 2.6).
7. Finding the inverse of a matrix.
8. Functions, domain, codomain, image, range.

9. Definition of linear transformations.
10. Properties of linear transformations (Theorem 2.8).
11. Relationship between matrix multiplication and linear transformations (Theorem 2.9).
12. Finding the standard matrix for a linear transformation.
13. Definition of onto and equivalent conditions for a linear transformation to be onto (Theorem 2.10).
14. Definition of one-to-one and equivalent conditions for a linear transformation to be one-to-one (Theorem 2.11).
15. Composition of linear transformations (Theorem 2.12), invertible linear transformations (Theorem 2.13).