

# MATH 593: Ninth Homework Assignment: Jordan Canonical Form

Due Wednesday November 16, 2005

**This week's reading:**

All of Chapter 12 should be read by now.

**Exercises:** from Dummit and Foote, *Abstract Algebra*, third edition.

Section 12.1: 19\*

[Refer to the paragraph above exercise 16 and exercises 16, 17, and 18, which I did in lecture (though perhaps with the matrix transposed from the book's notation). Be sure you understand the proof of the existence part of The Theorem on the structure of modules over a Euclidean domain, as described in class, which this exercise now completes.]

Section 12.2: 23\*

[Refer to exercise 22 and the preceding paragraph. This completes the proof that you can find the invariant factors for the rational canonical form of a matrix  $A$  by putting the matrix  $x\mathbb{I} - A$  into Smith normal form.]

Section 12.3 : 1, 2, 4, 5, 6, 7, 8, 9\*, 10, 11, 12, 13, 14, 15, 17, 18\*, 19, 20, 21, 22\*, 23, 27\*, 29, 31\*, 33, 34, 35, 36, 37, 38,

Please let me know by the end of the day Wednesday November 9 if you are planning to come to my office to discuss your second exams— all are invited for an oral re-take.