Math 331.1 **Problem Set 7** **Fall 2005**

Due: Friday, Nov. 4, start of class

Instructions: After you have calculated the requisite eigenvalues and eigenvectors with paper and pencil in problems #1 and #2, and if you are by then confident you know how to do that kind of calculation, you may then use technology to obtain ***exact*** eigenvalues and eigenvectors for the rest of the problems. For example, use the on-line matrix calculator at

`http://wims.unice.fr/wims/en_home.html`

(click the link "Online calculators and plotters" there and then the link "Matrix calculator"). The actual URL of this calculator is:
`wims.unice.fr/wims/wims.cgi?session=D86D9862&lang=en&module=tool%2Flinear%2Fmatrix.en`
Or, use *Mathematica* or *Maple*. But do ***not*** use your calculator or MATLAB, which give only approximate answers.

(Even for problems #1 and #2, you may wish to check your exact paper-and-pencil calculations with one of those tools or with one of the following that will given merely *decimal approximations:* the TI-89 calculator or the Matrix Fields tool from the textbook's CD.)

1. Do page 263, Exercise 4.
2. Do page 263, Exercise 6.
3. Do page 264, Exercise 14.
4. Do page 265, Exercise 20.
5. Do page 266, Exercise 22.
6. Do page 279, Exercise 4.
7. Do page 281, Exercise 20. In part (c), do what is asked *only* for the two initial conditions $A = (1, -1)$ and $D = (-1, 2)$.