

## Math 325, Spring, 2001

It is time to organize groups for the group projects. By Wednesday, February 28, please form a group with 2 or 3 other students in the class (so a group has 3 or 4 members). Each group should give me a list of the members of the group by February 28.

### Assignment 5, due March 2

Read Boyce and DiPrima, Sections 7.7-7.9, 9.1, 9.2, and *Differential Equations with Maple*, Chapter 12.

In Boyce and DiPrima, do (by hand, unless otherwise indicated) p. 400 #1, p. 407 #17,19, p. 417 #1. On p. 407 #17 also use Maple to find the matrices  $T$  and  $J$ . The Maple command `jordan(A,'P')` will find the Jordan canonical form  $J$  of  $A$ . The command `eval(P)` will then give the matrix  $T$ . The command `jordan` is in the `linalg` package. (Use the command: `with(linalg)` to load it.)

In *Differential Equations with Maple* do Problem Set F #1,4.

Also solve the following problems.

1. Solve:

$$\mathbf{y}' = \begin{bmatrix} 2 & 1 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 3 & 1 & 0 \\ 0 & 0 & 0 & 3 & 1 \\ 0 & 0 & 0 & 0 & 3 \end{bmatrix} \mathbf{y}, \quad \mathbf{y}(0) = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{bmatrix}.$$

2. Find the general solution of

$$\mathbf{y}' = \begin{bmatrix} 3 & 1 & 0 \\ 0 & 3 & 1 \\ 0 & 0 & 3 \end{bmatrix} \mathbf{y}.$$

For the problems from Problem Set F, you may work in groups, following the same rules as for Assignment 2. If you do work in a group, turn these problems in separately from the rest of the assignment.