

## MATH 267 (Section E1) Homework No. 8

### Reading

Sections 7.4, 7.5, 7.6, 7.8. (omit considerations on qualitative behavior of solutions. See on line notes for method of solution)

### Suggested Problems

Section 7.4: Exercise 5,6.

Section 7.5: Exercises 15,17.

Section 7.6 Exercises 1, 3, 9.

Section 7.8 Exercises 11,12.

### Problems to be handed in in class on Monday April 16

**Problem 1** Find the solution of the following boundary value problem

$$\vec{x}' = A\vec{x}, \quad \vec{x}(0) = \begin{pmatrix} 1 \\ -2 \end{pmatrix},$$

where

$$A = \begin{pmatrix} 3 & -1 \\ 3 & 2 \end{pmatrix}.$$

**Problem 2** Find a fundamental set of solutions of the system

$$\vec{x}' = A\vec{x},$$

where

$$A = \begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 1 \\ 0 & 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}.$$

**Problem 3** Find a fundamental set of solutions of the system

$$\vec{x}' = A\vec{x},$$

where

$$A = \begin{pmatrix} 0 & 0 & 0 & 2 \\ 0 & 0 & -2 & 1 \\ 1 & 2 & 0 & 0 \\ -2 & 0 & 0 & 0 \end{pmatrix}.$$