

## MATH 267 (Section E1) Homework No. 5

### Reading

Sections 4.1 through 4.3

### Suggested Problems

Section 4.1: Exercises 5, 6, 12, 13.

Section 4.2: Exercises 11, 15, 29, 31.

Section 4.3: Exercise 1, 5, 7.

### Problems to be handed in in class on Monday, February 26-th

**Problem 1** Consider the following functions

$$y_1 = t, \quad y_2 = \cos(t), \quad y_3 = 1, \quad y_4 = \sin(t).$$

Show that they form a fundamental set of solutions of the differential equation

$$y^{(4)} + y'' = 0$$

**Problem 3** Calculate the solution of the following 3-rd order Boundary Value Problem

$$\begin{aligned} y^{(3)} - 3y'' + 2y' &= 0, \\ y(0) = 1, \quad y'(0) &= 0, \quad y''(0) = -1. \end{aligned}$$

**Problem 2** Consider the differential equation

$$y^{(4)} - 16y = e^t + \sin(t).$$

Write the general solution using the method of undetermined coefficients.