

MATH 267 (Sections A3, C-1) Homework No. 6

Reading

- Section 11.1 up to pg. 646 (included)
- Section 11.2 up to Theorem 2.27 (included)
- Section 5.1
- Section 5.2

Suggested Problems

- Section 11.2, Exercises 3,9,13,17.
- Section 5.1, Exercises 3,7,9,13,25,29.
- Section 5.2, Exercises 3,7,19,23,25.

Problems to be handed in class (due Tuesday March 8-th)

Problem 1 (10 points)

Write in terms of power series the solution of the following initial value problem

$$y'' - 3xy = 0,$$

$$y(0) = 1, \quad y'(0) = 0,$$

i.e.

1. For

$$y(x) = \sum_{n=0}^{\infty} a_n x^n,$$

write the recurrence formula for the a_n 's.

2. From the recurrence formula express the a_n 's in terms of n .

Problem 2 (10 points)

Compute the Laplace transform of the following function

$$f(t) = 0, \quad t < 1,$$
$$f(t) = t^2 - 2t + 2, \quad t \geq 1.$$

Problem 3 (10 points)

Find the Laplace transforms of the solutions of the following initial value problems:

1.

$$y'' - y' - 6y = 0, \quad y(0) = 1, y'(0) = -1,$$

2.

$$y'' - 2y' + 2y = 0, \quad y(0) = 0, y'(0) = 1.$$