RUTGERS
UNIVERSITY | NEWARK

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Complex variables

Fall 2016

List of topics for the Final Exam

The list of topics for the Final Exam includes everything from the beginning of the course. The main focus will be on Chapters 4 and 5.

Chapter 1, 2, 3

You should review Chapters 1, 2, 3, at least go through your notes carefully. For details on what to review (and how) for these chapters, refer to the list of topics for Test #1 and Test #2.

Chapter 4: Power series

Review all of chapter 4 in depth, namely:

- 4.1 Series of complex numbers: sequences of complex numbers (also review Chap. 1.4 and 2.1), series of complex numbers, convergence and absolute convergence, ratio test for series of complex numbers.
- 4.2: Series of complex functions: pointwise convergence, uniform convergence and normal convergence.
- 4.3: Power series and analytic functions: radius and domain of convergence, ratio test for power series, Taylor expansions (also review Chap 3.1), properties of power series, analytic functions, properties of analytic functions.
- 4.4: Isolated zeros and Identity theorem.

Exercises: For this chapter, go over homework #9, #10, #11 and quiz #8.

Chapter 5: Cauchy theory

Review all of chapter 5 in depth, namely:

> 5.1: Integration along paths: integration of functions along paths in the complex plane, invariance under reparametrization, lengths of paths, fundamental lemma (Cauchy's theorem).

> 5.2: Cauchy's integral formula: 3 versions of Cauchy's integral formula, consequences.

Exercises: For this chapter, go over homework #11, #12, and quizzes #9, #10.

Advice

- Your lecture notes from class should be your primary (if not only) source of information. You are expected to know all the material in your lecture notes, and no other (unless you are told otherwise occasionally). Review your lecture notes regularly and thoroughly.
- Remember that all past quizzes, tests and homework exercises sheets are available on the course web page. Make sure you go over all of them (or as many as you can).
- I am happy to answer your questions, as long as: 1. They are math questions, and 2. You have made a genuine effort to think about your question before contacting me.
- The best way to prepare for the exams is to work regularly, make sure you understand all the material as it is being taught, do all the homework exercises, etc. Don't wait until the last moment to prepare. Don't try to guess what will be on the test, your time is best spent preparing for every possibility.