

List of topics for Test #1

Chapter 1: Complex numbers and the complex plane

Review all of chapter 1, namely:

- > 1.1 Basics: Definition of complex numbers, operations, conjugation and inverse, modulus and argument, the complex plane, etc.
- > 1.2 Polar form: Polar coordinates and polar form, geometric interpretation, Euler and de Moivre's formulas, unit complex numbers, roots of unity, etc.
- > 1.3 Complex exponential: Definition, properties, etc.
- > 1.4 Topology of \mathbb{C} : Open and closed sets, compact sets, connected sets and stronger notions of connectedness, converging sequences of complex numbers, etc.
- > 1.5 Complex algebraic equations: Complex polynomials, roots and multiplicities, fundamental theorem of algebra, etc.

Exercises: For this chapter, go over quizzes 1, 2, 3 and homework sheets 1, 2, 3. If you have extra time, you may look at exercises 1.1-1.5, 1.8-1.13, 1.17, 1.19, 1.23, 1.27 in the online textbook.

Chapter 2: Complex-valued functions of a complex variable

Review the first section of chapter 2, namely:

- > 2.1 Basics: Definitions related to functions $\mathbb{C} \rightarrow \mathbb{C}$, images and preimages of points and of sets, injectivity, surjectivity and bijectivity, examples, etc.

Exercises: For this chapter, go over homework sheet 4.

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.