

## MATH3XO3 (Complex Analysis) Spring 2010

### Information about Test 2

Instructor: Kiumars Kaveh

**Time and date: 11:30-12:20 (as before), Tuesday March 9, 2010.**

**Location: T29 101** (check the campus map, T29 is the name of building).

- There will be 4-5 questions in the test. No true/false questions. As in Test 1, the total is 50 marks.

- The test will be based on materials in Chapter 2. Occasionally some paragraphs in the text were not discussed in the lectures, in which case they won't be on the test. From Section 2.5 you need to know only material which was discussed on Friday in the lecture i.e. the statement of the maximum modulus principle (both versions 2.5.1, 2.5.6) and the proof of local version (2.5.1).

- You may be asked to state one or more of the following theorems/definitions (no proof):

- Definition of contour integral (2.1.1), Definition of a simple closed curve, Definition of a simply connected region (2.3.8), Definition of homotopic curves (2.3.6 and 2.3.7), Convex region (2.3.9), Definition of winding number (2.4.1).
- Fundamental Theorem of Calculus (2.1.7), Different forms of Cauchy's theorem (2.2.1 (preliminary version), 2.3.14, 2.4.10), Deformation theorem (2.2.2 (preliminary version), 2.3.12), Cauchy's integral formula (2.4.4, 2.4.6), Cauchy's inequalities (2.4.7), Liouville's theorem (2.4.8), Fundamental Theorem of Algebra (2.4.9), Morera's theorem (2.4.10), Maximum modulus theorem (2.5.1, 2.5.6).

- You may be asked to give proof of one (or more) of the following theorems from the text (using any other of the above theorems): Liouville's theorem,

Morera's theorem, Fundamental Theorem of Algebra.

- There will be questions to compute integrals using e.g. definition, Fundamental Theorem of Calculus (2.1), Cauchy's theorem (2.2-2.3), Cauchy's integral formula (2.4).

- There will be problem(s) to prove a statement (using theorems in the text). The proofs won't be very long.

- There will be a question related to topology notions e.g. show some set is simply connected, convex, or two curves are homotopic etc.