

For the upcoming test you will be asked questions based on the theory and homework covered after Test 1 (2.5, 3.1, 3.2, 3.3, 3.5, 4.1, 4.2, 4.3, 4.4 of the text). As with the first test, in addition to reviewing your homework, I suggest you work through the extra practice problems (from the textbook) that were assigned each week; some of these same questions will likely appear on the test. Note that I have not yet assigned any hand-in homework from Sections 4.4 and so you are strongly encouraged to work through the extra practice problems from that sections. Section 4.5 will not be on the test.

## Cheat Sheet and Calculator

A single double-sided letter-size handwritten “cheat sheet” containing formulae, theory and numerical values may be used for the test. The cheat sheet may not contain worked examples however, and must be submitted when you hand in your test.

A standard non-graphing scientific calculator may be used.

## Definitions and Concepts

Key concepts you should know:

1. what a harmonic function is, how to find a harmonic conjugate, and how harmonic functions are related to analytic functions.
2. the basic definitions and properties of polynomial, exponential, trigonometric and hyperbolic functions.
3. the definition and properties of the multiple valued  $\log(z)$  function and how to evaluate various branches of the function.
4. the definition and properties of the multiple valued complex power function  $z^\alpha$ .
5. how to compute contour integrals directly as in 4.2.
6. how to compute contour integrals using path independence and other equivalent properties (4.3, and in particular Theorems 6 and 7).
7. how to compute contour integrals using Cauchy's Integral Theorem: see problems 13, 15 and 16 at the end of section 4.4.