Complex Analysis 1, Test 2 Study Guide

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Fall 2009

Chapter III. Elementary Properties and Examples of Analytic Functions

3.1 Power Series. Convergent series, absolute convergence, $\underline{\lim}$, $\overline{\lim}$, power series, geometric series, radius of convergence, "ratio test," e^z.

3.2 Analytic Functions. Differentiable, continuously differentiable, analytic (Conway's definition), differentiability of series (Theorem 2.5), properties of exponentials, $\cos z$, $\sin z$, periodic functions, branch of the logarithm, principle branch of the logarithm, totality of branches of the log on a given set G, z^a and its branches, Cauchy-Riemann equations, harmonc function, harmonic conjugate.

Chapter IV. Complex Integration

4.1 Riemann-Stieltjes Integrals. Bounded variation, total variation, Riemann-Stieltjes integral, Dirac Delta *Distribution*, computation of path integrals using Theorem 1.9, the trace of a path and rectifiable path, Theorem 1.18 (our Fundamental Theorem of Calculus).

4.2 Power Series Representations of Analytic Functions. Theorem 2.6 (relationship between function values and path integrals), use of Theorem 2.6 to produce power series for "analytic" functions, computation of path integrals using Corollary 2.13.