

MATH 427: COMPLEX ANALYSIS (SUMMER 2018)

FINAL EXAM STUDY TOPICS

AUGUST 7, 2018

Note: the final is cumulative. Please review the midterm topics as well.

Section 2.6: The Cauchy integral formula: know how to evaluate contour integrals using the formula and Cauchy theorem.

Section 2.7: The index function: know the definition, how to compute it and the basic properties (e.g. continuity and constant on components)

Section 3.1: Uniform convergence; Convergence of power series (when pointwisely and when uniformly); Radius of convergence: be able to find it using root test (you need \limsup) and ratio test (when the limit exists).

Section 3.2: Properties of functions defined by power series (e.g. continuity, differentiability, integrability, analyticity, uniqueness etc); Power series expansion of analytic functions: be able to find the series expansion (the same as Taylor series expansion, the integral formula of the coefficients or $f^{(n)}$), know the series converges to the function where the function is analytic; Know Cauchy estimates and Morera theorem.

Section 3.3: Know Liouville's theorem and fundamental theorem of algebra: understand how to use Cauchy estimates to obtain similar results.

Section 3.4 (I): Zeros of analytic functions: know how to find the order, understand the zeros are isolated; know the identity theorem;

Section 3.4 (II): Isolated singularities: know the three types and characterizations, know the power series forms of poles and be able to find them.

Section 3.5: Only the maximum modulus principle.