

Oral Qualifying Exam Syllabus

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1 Analytic Number Theory

1. Poisson summation
2. Riemann ζ -function and Dirichlet L -functions
3. PNT for primes in arithmetic progressions
4. Bombieri-Vinogradov
5. Character sums (Polya-Vinogradov, Burgess bounds)
6. Basic idea of circle method

2 Modular Forms

1. Holomorphic modular forms: cusp forms, Fourier expansion of Eisenstein series
2. L -functions for modular forms
3. Hecke Operators
4. Maass forms: cusp forms, Fourier expansion of Eisenstein series

3 Algebraic Number Theory

1. Number fields, ring of integers
2. Factorization of prime ideals, ideal class group
3. Minkowski bound
4. Dirichlet Unit Theorem
5. Dedekind ζ -function, statement of class number formula