

Oral Qualifying Exam Syllabus

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Sieve Theory

Brun's sieve

Selberg's sieve

The large sieve

The asymptotic sieve and the parity principle

Elliptic Curves

Elliptic curves over finite fields

Elliptic curves over \mathbf{C}

Elliptic curves over local fields

Elliptic curves with complex multiplication

Analytic Number Theory

Analytic properties of Riemann's zeta function and Dirichlet L-functions

The Prime Number Theorem

Dirichlet's theorem on arithmetic progressions

The zeros of Riemann's zeta function

Algebraic Number Theory

The ring of integers of a number field

Splitting and ramification of prime ideals

The ideal class group

Dirichlet's unit theorem