

Analytic Number Theory (M24)

Professor H. Krieger

In this course we will cover results on the distribution of prime numbers, in particular the celebrated prime number theorem. This is done by studying analytic properties of the Riemann zeta function and using the tools of complex and Fourier analysis.

Topics likely to be covered include:

- Arithmetic functions
- The Riemann zeta function
- The prime number theorem
- The Riemann hypothesis and its connections with the distribution of primes
- Mean values of multiplicative functions
- Equidistribution and exponential sums

Prerequisites

Elementary number theory (Part II Number Theory), basic complex analysis (Part IB Complex Analysis).

Literature

1. T. Apostol, *Introduction to Analytic Number Theory*, Springer, 1976.
2. M. Ram Murty, *Problems in analytic number theory*, Springer, 2008.
3. H. Davenport, *Multiplicative number theory*, Springer, 2000.

Additional support

Four examples sheets will be provided and four associated examples classes will be given. There will be a one-hour revision class in the Easter Term.