

MATH 8440

Instructor: Paul Pollack

MATH 8440 will be an introduction to analytic methods in number theory, with an emphasis on concrete, easily-described problems. Possible topics to be discussed include

- the distribution of prime numbers (Euclid to Euler to Chebyshev to Mertens),
- Dirichlet's theorem on prime numbers in arithmetic progressions,
- elementary sieve methods and their applications (e.g., Brun's theorem on twin primes, Schnirelmann's theorem toward Goldbach's conjecture),
- character sums and the distribution of power residues,
- Waring's problem,
- the prime number theorem.

Prerequisites are minimal: I will assume familiarity with algebra and analysis (both real and complex) at the undergraduate level. Prior acquaintance with elementary number theory will be helpful but is not essential.