Prime factorization, complex analysis, and applications to arithmetic geometry

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tba, 4:00PM
(Tea: 300 Kemeny, 3:30 pm)

Abstract

Given a positive integer n, one knows that there is a unique prime factorization of n. However, in more general rings determining when one has unique factorization is a very difficult problem. As there are cases when one cannot factor elements uniquely into primes (try 6 in $\mathbb{Z}[\sqrt{-5}]$), one would also like some way to measure how far away from having unique factorization a ring is. The class group of a ring is a group that measures the failure of unique factorization. We will discuss some results about the class group that relate back to Fermat's last theorem, before moving on to more delicate results on divisibility of class groups. We will use the case of class groups of number fields to motivate more general results dealing with modular forms and Galois representations.

This talk should be accessible to graduate students.