

“The theory of Numbers has always been regarded as one of the most obviously useless branches of Pure Mathematics. The accusation is one against which there is no valid defence; and it is never more just than when directed against the parts of the theory which are more particularly concerned with primes. A science is said to be useful if its development tends to accentuate the existing inequalities in the distribution of wealth, or more directly promotes the destruction of human life. The theory of prime numbers satisfies no such criteria.”

— G.H. Hardy

The Trivial Notions Seminar Proudly Announces

Newman’s very short proof of the Prime Number Theorem

A talk by
Lynnelle Ye

Abstract

The Prime Number Theorem, which states that the fraction of integers between 1 and x which are prime is about $1/\log x$, has a long and exciting history. Highlights include Hadamard and de la Vallée-Poussin in 1896 giving the first, very complicated proof, building on work of Riemann; Hardy in 1921 suggesting that the theorem might lie inherently deeper than basic arithmetic, so that no “elementary” proof would ever be found; and Erdos and Selberg in 1948 disproving this by finding such an elementary (though still extremely complicated) proof—only to become embroiled in a bitter priority dispute. In 1980, building on previous work along similar lines by Hardy and Littlewood, Donald J. Newman found the simplest proof known to Wikipedia—3 pages and using nothing deeper than the Cauchy integral formula. In this talk, we will go through Newman’s proof and discuss its historical and mathematical context.

Thursday, October 8st, at 12:45 pm
Science Center 232