

COLLOQUIUM

An Introduction to the p -adic Integers

Tom Blackford

Department of Mathematics
Western Illinois University

Abstract

The topic of the p -adic integers and p -adic numbers is a fascinating branch of mathematics that mixes algebra, number theory, analysis and topology, and has several applications, including mathematical physics. The p -adic numbers were discovered by Kurt Hensel (1861-1941), who showed how solutions of certain equations modulo p^n , in the complex numbers and in other fields. For each prime p , the p -adic numbers have a different absolute value function that in turn leads to a different topology, which in turn leads to different versions of classical propositions from calculus and analysis, including the Triangle Inequality, Newton's Method and the Mean Value Theorem. In this purely expository talk, I will give the basic definitions and properties for the p -adic integers and p -adic numbers.

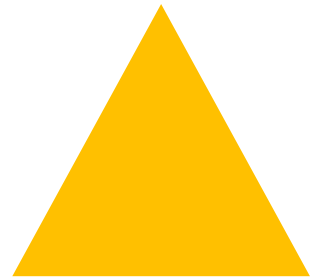
Department
of
Mathematics

Thursday,
November 5,
2009

4:00 p.m.

204 Morgan Hall

Refreshments will be
served at 3:45 p.m.



WESTERN
ILLINOIS
UNIVERSITY