

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

THURSDAY, May 31, 2007

BOND HALL 227

4:00 pm

Title: Continued Fractions

Speaker: Rita Parsons, Western Washington University

Abstract: Number Theory is looked upon by many as useless, since applications to real-world problems are often not apparent or substantial. But in the world of mathematics, there are few branches without a connection to the theory of numbers. At some point in their careers, most of the great masters of mathematics have contributed to this body of knowledge.

My topic of study is Continued Fractions. I will explain what they are, how to compute them, and show several equations that can be solved using them. The basic form for an *infinite simple continued fraction* is

$$a_0 + \frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{\ddots + \frac{1}{a_n + \frac{1}{\ddots}}}}}$$

The a_i are called the partial denominators, where a_i is a positive integer for $i = 1, 2, 3, \dots$, and a_0 is any integer. A convenient shorthand notation is $[a_0; a_1, a_2, \dots]$.

They also have some historical importance. One very practical use, before the days of electronic computational devices, was for finding rational numbers that were "close" approximations to irrational numbers. While some of the theorems involved can be quite challenging, the topic is accessible to anyone interested in numbers.

Refreshments will precede the talk at 3:30pm in Bond Hall 300
courtesy of Robert Jewett.