1. Course overview

This is an introductory Number Theory course. We will follow closely the lecture notes available on my web page:

www.math.utah.edu/~savin

We expect to cover Chapters 1 - 6, 8 and 9. We will emphasize the role and importance of groups in the subject. To give you a taste of the course, here are some problems that will be studied and nicely answered.

• Show that the sequences 1, 4, 7, 10, 13... and 2, 5, 8, 11, 14, 17... contain infinitely many primes. (The problem of primes in a progression.)
• Develop a fast test to decide if $2^p - 1$, a Mersenne number, is a prime number or not.
• Find all integral solutions of the Pell equation $x^2 - 2y^2 = 1$. (This in turn can be used to find all square-triangular numbers.)

It is interesting to mention that the first of these problems is solved using calculus. The second makes use of a group of order $2^p$, while the third is solved by combining a geometric argument with an observation that all solutions of the Pell equation form a group!

2. Grade and Syllabus

Grade will be based on 6 exams: 4 quizzes, midterm (June 22) and the final exam on Thursday, August 02, from 12:30 to 3:30. The quizzes will be on Fridays, on the 2nd, 4th, 8th and 10th week. HW is all exercises in the notes at the end of each section. I will not collect HW. However, each quiz will be a selection of HW problems. Should you need some help with the material or HW, stop by my office. (My office hours are MWF, 11:00 - 12:00.)

3. Course log

First week: Sections 1-3 in Chapter 1.