MATH 4400, MWF 10:45-11:35 IN ST 208

GORDAN SAVIN, OFFICE LCB 205

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 $1, 4, 7, 10, 13\ldots$ and $2, 5, 8, 11, 14, 17\ldots$ 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 7 exams: 5 half hour quizes, 10 points each, and two exams, 20 points each. No final exam.

The quizes and the first exam will be every other Friday: Sep. 04, Sep. 18, Oct 02, the first exam in Oct. 23, Nov 06, Nov 20 and the second exam on Dec 09 (Wednesday.) The HW is all exercises in the notes at the end of each section. I will not collect the HW. However, each quiz will be a selection of the HW problems. Should you need some help with the material, stop by my office. (My office hours are MWF, 9:30 - 10:30.)

3. Course log

The first week: Sections 1-3 in Chapter 1.