General Information.

The Midterm Exam will take place in class on Friday, October 14th during our usual class time (11:15am-12:05pm), and will cover Chapters 1-3, as well as Sections 4.1-4.3 of the lecture notes. The exam will include a true/false section and a free response section. There will likely be some choice of problems in the free response section (e.g. "choose 3 of the 4 problems below"). You are allowed a full sheet of notes (front and back) for the exam and a calculator (I may ask you to do some small computations, but I'll bring extra calculators if you don't have one). I suggest reviewing homework, problems I did not assign from the lecture notes, as well as some of the examples and simpler proofs from the lecture notes.

Topics.

Here is a list of keywords to help you study.

- The fundamental theorem of arithmetic
- Properties of least commmon multiples and greatest common divisors
- (Completely) multiplicative and additive functions
- The Euler totient and Möbius functions
- Dirichlet products and Möbius inversion
- Dirichlet inverses
- Cyclotomic polynomials
- Linear recurrence sequences, Lucas sequences and the Zsigmondy set
- Natural density computations
- Carmichael numbers
- Probabilistic primality tests (Fermat and Miller-Rabin)
- Nonexistence of solutions to Diophantine equations through congruence considerations