# Midterm 1 Study Guide

## Material covered

Up to and including chapter 6.

- Definitions to know:
  - Divisibility
  - gcd and lcm
  - prime and composite numbers
- You should know all theorem and lemma statements. Especially:
  - Well-ordering principle
  - Every number is a product of primes
  - Euclidean division
  - Euclidean algorithm
  - gcd is the smallest integer linear combination of the terms
  - Every number is a product of primes in a unique way (up to order of factors)
  - lcm divides all other common multiples
  - Applications of Fundamental Theorem
- Theorems you should know how to prove:
  - Sketch the idea of why every number is a product of primes
  - Prove that the gcd is the last non-zero remainder in the euclidean algorithm
  - Prove that lcm(a, b) divides all other common multiples of a, b
  - Prove the condition about when a diophantine equation $ax + by = c$ has a solution.

## Practice Problems

- Know very well all the turned-in assignments (1-5)
- Know how to do the non-optional practice problems
- Be ready for true/false questions
- Being able to do basic proofs by induction
- Solving diophantine equations