

NUMBER THEORY

Math 522

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Preparing for the First Exam

I. Chapter 1

- Prove simple properties of the Fibonacci numbers.
- Do induction proofs with recursively defined sequences.
- Know the definitions of floor, ceiling and know how to work with them.
- Be able to state and use the division theorem.

II. Chapter 2

- Convert from one base to another.
- Compute in a given base (addition in any base, multiplication in bases 2, 3).

III. Chapter 3

- Be able to state and use the prime number theorem (3.3).
- Know the difference between relatively coprime and pairwise coprime.
- Know that the gcd of two integers is the smallest positive linear combination of the two integers.
- Compute the gcd of two integers using the Euclidean algorithm.
- Write the gcd as a linear combination of the two integers.
- The unique factorization theorem is one of the most fundamental results in number theory. Be able to state it precisely and use it in a variety of contexts.
- Solve a linear diophantine equation.

No calculators can be used on the exam.