

NUMBER THEORY

Math 522

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Preparing for the First Exam

Things you should be able to do.

I. Chapter 1

- Use summation notation and product notation: e.g. change the index of summation.
- Do induction proofs with recursively defined sequences.
- Prove simple properties of the Fibonacci numbers.
- Know the definitions of floor, ceiling and know how to work with them.
- Be able to state and use the division theorem.
- Prove divisibility properties.

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 (3.4).
- Know the difference between relatively coprime and pairwise coprime.
- Prove basic results about the gcd.
- 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.

No calculators can be used on the exam.