

DISCRETE MATHEMATICS

Math 245

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Suggestions for preparing for the Third Exam

I. Sequences and recursion.

- Be able to use summation and product notation.
- Be able to use recursive formulas.
- Find the first several terms of a sequence given the initial terms and the recurrence formula.
- Find the formula for the n th term as a function of n for some simple examples.

II. Know the formulas for the following sums:

- The sum of a geometric sequence.
- The sum of the first n integers.

III. Know how to prove by induction!

- Be able to do several types of induction proofs.
 - Prove that a formula for the n th term of a sequence is correct.
 - Prove divisibility results.
 - Establish inequalities.
 - Use strong induction for a recursively defined sequence of order 2 or more.
- Follow the standard structure.
 - Use full sentences.
 - State the predicate.
 - Prove the base step(s).
 - State the assumption for the inductive step.
 - Do the inductive step.