MATH 2305: Discrete Mathematics
Fall 2024

1 Logic and Proofs

2 Sets, Functions, Sequences, Sums, and Matrices

3 Algorithms

3.1 Algorithms

4 Number Theory and Cryptography

4.1 Divisibility and Modular Arithmetic

4.2 Integer Representation and Algorithms

4.3 Primes and Greatest Common Divisors

4.4 Solving Congruences

5 Induction and Recursion

5.1 Mathematical Induction

5.2 Strong Induction and Well-Ordering

5.3 Recursive Defintions and Structural Induction

5.4 Recursive Algorithms

6 Counting

7 Discrete Probability

7.1 An Introduction to Discrete Probability

8 Advanced Counting Techniques

8.1 Applications of Recurrence Relations

8.2 Inclusion-Exclusion

9 Relations

9.1 Relations and Their Properties

10 Graphs

10.1 Graphs and Graph Models

10.2 Graph Terminology and Special Types of Graphs

11 Trees

11.1 Introduction to Trees