CONTENTS

| Preface | | | xi |
|---------|----|---------------------------------|-----|
| | _ | | |
| | 1 | The Pigeonhole Principle | 1 |
| | 2 | Basic Proof Techniques | 11 |
| | 3 | Proof by Mathematical Induction | 25 |
| | 4 | Strong Induction | 39 |
| | 5 | Sets | 49 |
| | 6 | Relations and Functions | 59 |
| | 7 | Countable and Uncountable Sets | 69 |
| | 8 | Structural Induction | 79 |
| | 9 | Propositional Logic | 89 |
| | 10 | Normal Forms | 101 |
| | 11 | Logic and Computers | 111 |
| | 12 | Quantificational Logic | 119 |
| | 13 | Directed Graphs | 133 |
| | 14 | Digraphs and Relations | 141 |
| | 15 | States and Invariants | 151 |
| | 16 | Undirected Graphs | 161 |
| | 17 | Connectivity | 173 |
| | 18 | Coloring | 179 |
| | 19 | Finite Automata | 187 |
| | 20 | Regular Languages | 201 |
| | 21 | Order Notation | 211 |
| | 22 | Counting | 233 |
| | 23 | Counting Subsets | 243 |

x CONTENTS

| | 24 | Series | 261 |
|-------|----|----------------------------------|-----|
| | 25 | Recurrence Relations | 277 |
| | 26 | Probability | 297 |
| | 27 | Conditional Probability | 311 |
| | 28 | Bayes' Theorem | 323 |
| | 29 | Random Variables and Expectation | 335 |
| | 30 | Modular Arithmetic | 359 |
| | 31 | Public Key Cryptography | 371 |
| | | | |
| Index | | | 381 |