

Contents

Chapter One Logic and Sets

1.1	Introduction	1
1.2	Logical Connectives	11
1.3	Logical Equivalence	18
1.4	Logical Quantifiers	27
1.5	Operations on Sets	34
1.6	Direct and Indirect Proofs	48
1.7	Mathematical Induction	59
	Chapter Problems	73

Chapter Two Number Theory

2.1	Introduction	83
2.2	Division Algorithm	88
2.3	Euclidean Algorithm	97
2.4	Prime Numbers and the Fundamental Theorem of Arithmetic	109
2.5	Modular Addition and Multiplication	117
	Chapter Problems	129

Chapter Three Functions

3.1	Introduction	137
3.2	One-to-One Functions and Onto Functions	142
3.3	Inverse Functions and Composition	152
	Chapter Problems	159

Chapter Four Relations

4.1	Introduction	165
4.2	Properties of Relations	173
4.3	Equivalence Relations	184
	Chapter Problems	194

Chapter Five Combinatorics

5.1	Introduction	201
5.2	Addition and Multiplication Principles	206
5.3	Permutations and Combinations	217
5.4	Ordered Partitions and Distributions	233
5.5	Binomial and Multinomial Theorems	244
	Chapter Problems	255

Answers to Selected Odd-Numbered Exercises

Index