
Contents

PART ONE
Noncommutative Algebra 1

CHAPTER 1
Definitions and Examples of Groups 3

CHAPTER 2
Subgroups and Cosets 14

CHAPTER 3
Homomorphisms 30

CHAPTER 4
Group Actions 42

CHAPTER 5
The Sylow Theorems and p -groups 55

CHAPTER 6
Permutation Groups 70

CHAPTER 7
New Groups from Old 83

CHAPTER 8
Solvable and Nilpotent Groups 99

CHAPTER 9
Transfer 115

CHAPTER 10
Operator Groups and Unique Decompositions 129

CHAPTER 11
Module Theory without Rings 142

CHAPTER 12
Rings, Ideals, and Modules 159

CHAPTER 13
Simple Modules and Primitive Rings 177

CHAPTER 14
Artinian Rings and Projective Modules 194

CHAPTER 15
An Introduction to Character Theory 213

PART TWO
Commutative Algebra 231

CHAPTER 16
Polynomial Rings, PIDs, and UFDs 233

CHAPTER 17
Field Extensions 254

CHAPTER 18
Galois Theory 274

CHAPTER 19
Separability and Inseparability 293

CHAPTER 20
Cyclotomy and Geometric Constructions 307

CHAPTER 21
Finite Fields 326

CHAPTER 22
Roots, Radicals, and Real Numbers 342

CHAPTER 23
Norms, Traces, and Discriminants 359

CHAPTER 24
Transcendental Extensions 379

CHAPTER 25	
<i>The Artin-Schreier Theorem</i>	401
CHAPTER 26	
<i>Ideal Theory</i>	418
CHAPTER 27	
<i>Noetherian Rings</i>	433
CHAPTER 28	
<i>Integrality</i>	453
CHAPTER 29	
<i>Dedekind Domains</i>	474
CHAPTER 30	
<i>Algebraic Sets and the Nullstellensatz</i>	493
<i>Index</i>	507