

Contents

Preface	vii
To the Reader	ix
Rings	1
Homomorphisms and Ideals	7
Quotient Rings	10
Polynomial Rings over Fields	12
Prime Ideals and Maximal Ideals	17
Finite Fields	20
Irreducible Polynomials	22
Classical Formulas	25
Splitting Fields	28
Solvability by Radicals	33
The Galois Group	35
Primitive Roots of Unity	38
Insolvability of the Quintic	41
Independence of Characters	43
Galois Extensions	46

xii	Contents
Fundamental Theorem of Galois Theory	48
Applications	50
Galois's Great Theorem	54
Discriminants	56
Galois Groups of Quadratics, Cubics, and Quartics	59
Epilogue	64
Appendix 1. Group Theory Dictionary	67
Appendix 2. Group Theory Used in the Text	69
Appendix 3. Ruler-Compass Constructions	85
Appendix 4. Old-fashioned Galois Theory	93
References	103
Index	105