

# CONTENTS

*Preface* vii

*To the Student* xiv

## **Chapter 1 The Language of Algebra** 1

- 1.1** From Arithmetic to Algebra 2
  - 1.2** Exponents and the Order of Operations 11
  - 1.3** The Properties of Addition and Multiplication 21
  - 1.4** Adding and Subtracting Algebraic Expressions 29
- Summary 37  
Summary Exercises 38  
Self-Test for Chapter 1 41

## **Chapter 2 Signed Numbers** 43

- 2.1** Signed Numbers and Order 44
  - 2.2** Adding Signed Numbers; Finding the Median 53
  - 2.3** Subtracting Signed Numbers; Finding the Range 65
  - 2.4** Multiplying Signed Numbers 75
  - 2.5** Dividing Signed Numbers 85
  - 2.6** Evaluating Algebraic Expressions; Summing a Set of Numbers 93
- Summary 103  
Summary Exercises 105  
Self-Test for Chapter 2 107

## **Chapter 3 Equations and Inequalities** 109

- 3.1** Solving Equations by Adding and Subtracting 110
  - 3.2** Solving Equations by Multiplying and Dividing; The Mean 127
  - 3.3** Combining the Rules to Solve Equations 139
  - 3.4** Solving Literal Equations 155
  - 3.5** More on Linear Equations 163
  - 3.6** Inequalities—An Introduction 177
- Summary 193

- Summary Exercises 195
- Self-Test for Chapter 3 197
- Cumulative Test for Chapters 1–3 199

## **Chapter 4 Polynomials** 201

- 4.1** Multiplying and Dividing Algebraic Expressions 202
  - 4.2** Extending the Properties of Exponents 213
  - 4.3** Zero and Negative Exponents 221
  - 4.4** An Introduction to Polynomials 229
  - 4.5** Adding and Subtracting Polynomials 237
  - 4.6** Multiplying Polynomials 247
  - 4.7** Special Products 259
  - 4.8** Dividing Polynomials 267
- Summary 277  
Summary Exercises 279  
Self-Test for Chapter 4 283  
Cumulative Test for Chapters 1–4 283

## **Chapter 5 Factoring Polynomials** 287

- 5.1** An Introduction to Factoring 288
  - 5.2** The Difference of Squares 295
  - 5.3** Factoring by Grouping 301
  - 5.4** Factoring Trinomials of the Form  $ax^2 + bx + c$  307
  - 5.5** Solving Equations by Factoring 321
  - 5.6** More on Literal Equations 335
  - 5.7** Direct and Inverse Variation 339
- Summary 343  
Summary Exercises 345  
Self-Test for Chapter 5 349  
Cumulative Test for Chapters 1–5 351

## **Chapter 6 Algebraic Fractions** 353

- 6.1** An Introduction to Algebraic Fractions 354

- 6.2** Writing Algebraic Fractions in Simplest Form 359
- 6.3** Multiplying and Dividing Algebraic Fractions 369
- 6.4** Adding and Subtracting Like Fractions 377
- 6.5** Adding and Subtracting Unlike Fractions 385
- 6.6** Complex Fractions 399
- 6.7** Equations Involving Fractions 407
- 6.8** Ratio and Proportion 425
- 6.9** An Introduction to Probability 431
- Summary 437
- Summary Exercises 441
- Self-Test for Chapter 6 445
- Cumulative Test for Chapters 1–6 447

## **Chapter 7 Graphing Linear Equations and Inequalities 449**

- 7.1** Solutions of Equations in Two Variables 450
- 7.2** The Rectangular Coordinate System 459
- 7.3** Graphing Linear Equations 471
- 7.4** The Slope of a Line 497
- 7.5** Graphing Linear Inequalities 515
- 7.6** Scatter Plots and Line Graphs 529
- Summary 541
- Summary Exercises 543
- Self-Test for Chapter 7 549
- Cumulative Test for Chapters 1–7 551

## **Chapter 8 Systems of Linear Equations 553**

- 8.1** Solving Systems of Linear Equations by Graphing 554
- 8.2** Solving Systems of Linear Equations by Addition 569

- 8.3** Solving Systems of Linear Equations by Substitution 589
- Summary 601
- Summary Exercises 603
- Self-Test for Chapter 8 607
- Cumulative Test for Chapters 1–8 609

## **Chapter 9 Radicals 615**

- 9.1** Roots and Radicals 616
- 9.2** Simplifying Radical Expressions 627
- 9.3** Adding and Subtracting Radicals 637
- 9.4** Multiplying and Dividing Radicals 643
- 9.5** The Distance Between Two Points 651
- Summary 657
- Summary Exercises 659
- Self-Test for Chapter 9 661
- Cumulative Test for Chapters 1–9 663

## **Chapter 10 Quadratic Expressions 665**

- 10.1** Quadratic Equations 666
- 10.2** Solving Quadratic Equations by Completing the Square 675
- 10.3** The Quadratic Formula 683
- 10.4** Graphing Quadratic Equations 695
- 10.5** Applications of the Pythagorean Theorem 709
- Summary 717
- Summary Exercises 719
- Self-Test for Chapter 10 723
- Cumulative Test for Chapters 1–10 725

## **Appendix The Arithmetic of Rational Numbers 729**

- Answers to Self-Tests and Cumulative Tests* 741
- Index* 747