CONTENTS

1 Introduction to Algebra and Algebraic Expressions

1.1 Introduction to Algebra 2
1.2 The Commutative, Associative, and Distributive Laws 8
1.3 Fractional Notation 14
1.4 Positive and Negative Real Numbers 22
1.5 Addition of Real Numbers 30
1.6 Subtraction of Real Numbers 36
1.7 Multiplication and Division of Real Numbers 42
1.8 Exponential Notation and Order of Operations 49
Summary and Review 56
Test 58

2 Equations, Inequalities, and Problem Solving

2.1 Solving Equations 62
2.2 Using the Principles Together 68
2.3 Formulas 75
2.4 Applications with Percent 80
2.5 Problem Solving 84
2.6 Solving Inequalities 95
2.7 Problem Solving Using Inequalities 103
Summary and Review 107
Test 110

3 Introduction to Graphing

3.1 Ordered Pairs and Graphs 114
3.2 Graphing Linear Equations 122
3.3 More on Graphing Linear Equations 129
3.4 Graphs and Problem Solving 135
Summary and Review 142
Test 144

Cumulative Review: Chapters 1–3 145

4 Polynomials

4.1 Exponents and Their Properties 148
4.2 Polynomials 154
4.3 Addition and Subtraction of Polynomials 162
4.4 Multiplication of Polynomials 169
4.5 Special Products 175
4.6 Polynomials in Several Variables 183
4.7 Division of Polynomials 190
4.8 Negative Exponents and Scientific Notation 195
Summary and Review 203
Test 206

5 Polynomials and Factoring

5.1 Introduction to Factoring 210
5.2 Factoring Trinomials of the Type $x^2 + bx + c$ 214
5.3 Factoring Trinomials of the Type $ax^2 + bx + c$, $a \neq 1$ 220
5.4 Factoring Trinomial Squares and Differences of Squares 228
5.5 Factoring: A General Strategy 234
5.6 Solving Quadratic Equations by Factoring 239
5.7 Problem Solving 246
Summary and Review 253
Test 255

6 Rational Expressions and Equations

6.1 Rational Expressions 258
6.2 Multiplication and Division 263
6.3 Addition and Subtraction 268
6.4 Least Common Multiples and Denominators 273
6.5 Addition and Subtraction with Unlike Denominators 279

6.6 Complex Rational Expressions 285
6.7 Solving Rational Equations 290
6.8 Problem Solving: Rational Equations and Proportions 296
6.9 Formulas 307
Summary and Review 311
Test 314

Cumulative Review: Chapters 1–6 315

7 Graphs and Slope

7.1 Slope 318
7.2 Slope–Intercept Form 326
7.3 Point–Slope Form 332
7.4 Linear Inequalities in Two Variables 336
7.5 Direct and Inverse Variation 340
Summary and Review 346
Test 349

8 Systems of Equations and Problem Solving

8.1 Systems of Equations and Graphing 352
8.2 Systems of Equations and Substitution 357
8.3 Systems of Equations and Elimination 363
8.4 More Problem Solving with Systems 371
8.5 Systems of Linear Inequalities 379
Summary and Review 381
Test 384

9 Radical Expressions and Equations

9.1 Introduction to Square Roots and Radical Expressions 386
9.2 Multiplying and Simplifying Radical Expressions 391
9.3 Quotients Involving Square Roots 395
9.4 More Operations with Radicals 400
9.5 Radical Equations 405
9.6 Right Triangles and Problem Solving 411
9.7 Higher Roots and Rational Exponents 416
Summary and Review 421
Test 424

10 Quadratic Equations

10.1 Solving Quadratic Equations: The Principle of Square Roots 426
10.2 Solving Quadratic Equations: Completing the Square 429
10.3 The Quadratic Formula and Problem Solving 433
10.4 Complex Numbers as Solutions of Quadratic Equations 442
10.5 Graphs of Quadratic Equations 445
10.6 Functions 451
Summary and Review 460
Test 462

Cumulative Review: Chapters 1–10 464

Appendixes

A Sets 467
B Factoring Sums or Differences of Cubes 471

Tables

Table 1 Squares and Square Roots 473
Table 2 Geometric Formulas 474

Answers A-1

Index I-1