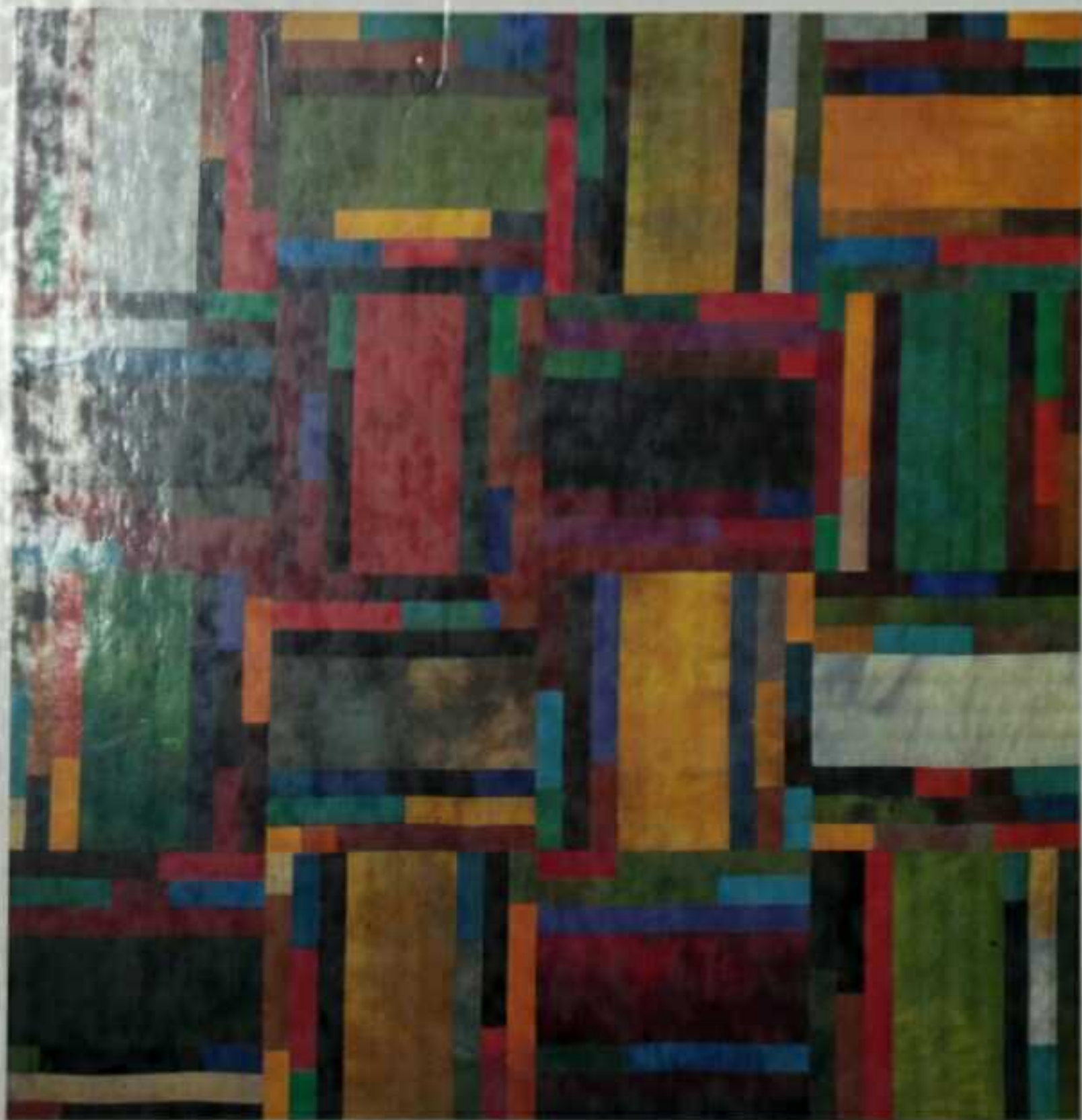


Algebra

A Graphing Approach



HUBBARD ■ ROBINSON



Contents

Chapter 1

The Real Number System

1

- 1.1 The Real Numbers 2
- 1.2 Addition 13
- 1.3 Subtraction 21
- 1.4 Multiplication 29
- 1.5 Division 37
- 1.6 Exponents, Square Roots, Order of Operations 44
- 1.7 Properties of the Real Numbers 54
- Chapter Review Exercises 64
- Chapter Test 67

Chapter 2

Algebra Basics

69

- 2.1 Algebraic Expressions and Formulas 70
- 2.2 Simplifying Expressions 77
- 2.3 Properties of Exponents 84
- 2.4 Zero and Negative Exponents 95
- 2.5 Scientific Notation 104
- Chapter Review Exercises 110
- Chapter Test 113
- Cumulative Test: Chapters 1–2 115

Chapter 3

The Coordinate Plane and Functions

117

- 3.1 The Coordinate Plane 118
- 3.2 Relations and Functions 131
- 3.3 Graphing on a Calculator 141
- 3.4 Functions: Notation and Evaluation 151
- 3.5 Analysis of Functions 160
- Chapter Review Exercises 171
- Chapter Test 173

Chapter 4**Linear Equations and Inequalities**

177

- 4.1 Introduction to Linear Equations 178
- 4.2 Solving Linear Equations 187
- 4.3 Formulas 198
- 4.4 Applications 207
- 4.5 More Applications 220
- 4.6 Linear Inequalities 232
- 4.7 Compound Inequalities 242
- 4.8 Absolute Value: Equations and Inequalities 252
- 4.9 Applications 263
- Chapter Review Exercises 269
- Chapter Test 273
- Cumulative Test: Chapters 3–4 275

Chapter 5**Properties of Lines**

277

- 5.1 Linear Equations in Two Variables 278
- 5.2 Slope of a Line 291
- 5.3 Applications of Slope 303
- 5.4 Equations of Lines 314
- 5.5 Graphs of Linear Inequalities 325
- Chapter Review Exercises 337
- Chapter Test 341

Chapter 6**Systems of Linear Equations**

343

- 6.1 Graphing and Substitution Methods 344
- 6.2 The Addition Method 356
- 6.3 Systems of Equations in Three Variables 366
- 6.4 Matrices 378
- 6.5 Applications 389
- 6.6 Systems of Linear Inequalities 400
- Chapter Review Exercises 407
- Chapter Test 411
- Cumulative Test: Chapters 5–6 413

Chapter 7**Polynomials**

415

- 7.1 Addition and Subtraction 416
- 7.2 Multiplication and Special Products 426
- 7.3 Common Factors and Grouping 436
- 7.4 Special Factoring 444
- 7.5 Factoring Trinomials 451
- 7.6 Solving Equations by Factoring 461
- 7.7 Division 471
- 7.8 Synthetic Division 478
- 7.9 The Remainder and Factor Theorems 483
- Chapter Review Exercises 491
- Chapter Test 495

Chapter 8**Rational Expressions**

497

- 8.1 Introduction to Rational Expressions 498
- 8.2 Multiplication and Division 508
- 8.3 Addition and Subtraction 517
- 8.4 Complex Fractions 529
- 8.5 Equations with Rational Expressions 539
- 8.6 Applications 550
- Chapter Review Exercises 562
- Chapter Test 565
- Cumulative Test: Chapters 7–8 567

Chapter 9**Radical Expressions**

569

- 9.1 Radicals 570
- 9.2 Rational Exponents 576
- 9.3 Properties of Rational Exponents 584
- 9.4 Properties of Radicals 589
- 9.5 Simplifying Radicals 598
- 9.6 Operations with Radicals 608
- 9.7 Rationalizing Denominators 616
- 9.8 Equations with Radicals and Exponents 624
- 9.9 Complex Numbers 636
- Chapter Review Exercises 647
- Chapter Test 651

Chapter 10**Quadratic Equations**

653

10.1 Special Methods	654
10.2 Completing the Square	661
10.3 The Quadratic Formula	669
10.4 Equations in Quadratic Form	680
10.5 Applications	689
10.6 Quadratic Inequalities	700
10.7 Higher Degree and Rational Inequalities	708
10.8 Quadratic Functions	716
Chapter Review Exercises	730
Chapter Test	733

Chapter 11**Exponential and Logarithmic Functions**

735

11.1 Algebra of Functions	736
11.2 Inverse Functions	749
11.3 Exponential Functions	758
11.4 Logarithmic Functions	769
11.5 Properties of Logarithms	779
11.6 Logarithmic and Exponential Equations	788
Chapter Review Exercises	798
Chapter Test	801
Cumulative Test: Chapters 9–11	803

Answers to Odd-Numbered Exercises A1**Index of Applications** A59**Index** A63