Table of Contents

CHAPTER 1 Real Numbers and Algebraic Expressions 1

Study Strategies: An Introduction to the P.O.W.E.R. Framework 2
Study Strategies: Using P.O.W.E.R. to Succeed in Your Course 3
Section 1.1 Set of Numbers 5
Section 1.2 Operations on Real Numbers 13
Section 1.3 Exponents, Roots, and Order of Operations 21
Section 1.4 Algebraic Expressions and Properties of Real Numbers 27
Group Activity 32
emPOWERme: Why Am I Going to College? 33
Chapter 1 Summary 34
Chapter 1 Review Exercises 36
Chapter 1 Test 37

CHAPTER 2 Linear Equations in One Variable 38

Study Strategies: How to Read Math (and Other) Textbooks 39
Section 2.1 Linear Equations in One Variable 41
Section 2.2 Applications of Linear Equations 54
Section 2.3 Geometry Applications and Solving Formulas 68
Section 2.4 More Applications of Linear Equations 79
Group Activity 89
emPOWERme: Organize Your Memory 90
Chapter 2 Summary 92
Chapter 2 Review Exercises 94
Chapter 2 Test 96
Cumulative Review for Chapters 1–2 97

CHAPTER 3 Linear Inequalities and Absolute Value 98

Study Strategies: Time Management 99
Section 3.1 Linear Inequalities in One Variable 101
Section 3.2 Compound Inequalities in One Variable 113
Section 3.3 Absolute Value Equations and Inequalities 121
Group Activity 133
emPOWERme: Identify the Black Holes of Time Management 134
Chapter 3 Summary 136
Chapter 3 Review Exercises 137
Chapter 3 Test 138
Cumulative Review for Chapters 1–3 139

CHAPTER 4 Linear Equations in Two Variables and Functions 140

Study Strategies: Taking Notes in Class 141
Section 4.1 Introduction to Linear Equations in Two Variables 143
Section 4.2 Slope of a Line and Slope-Intercept Form 160
Section 4.3 Writing an Equation of a Line 175
Section 4.4 Linear and Compound Linear Inequalities in Two Variables 191
Section 4.5 Introduction to Functions 203
Group Activity 221
emPOWERme: Checklist for Effective Notes 222
Chapter 4 Summary 223
Chapter 4 Review Exercises 229
Chapter 4 Test 233
Cumulative Review for Chapters 1–4 235

CHAPTER 5 Solving Systems of Linear Equations 236

Study Strategies: Taking Math Tests 237
Section 5.1 Solving Systems of Linear Equations in Two Variables 240
Section 5.2 Solving Systems of Linear Equations in Three Variables 259
Section 5.3 Applications of Systems of Linear Equations 268
Section 5.4 Solving Systems of Linear Equations Using Matrices 282
Group Activity 290
emPOWERme: What Is My Test-Taking Style? 293
Chapter 5 Summary 294
Chapter 5 Review Exercises 298
Chapter 5 Test 300
Cumulative Review for Chapters 1–5 301

CHAPTER 6 Polynomials and Polynomial Functions 302

Study Strategies: Doing Math Homework 303
Section 6.1 The Rules of Exponents 306
Section 6.2 More on Exponents and Scientific Notation 316
Section 6.3 Addition and Subtraction of Polynomials and Polynomial Functions 326
Section 6.4 Multiplication of Polynomials and Polynomial Functions 337
Section 6.5 Division of Polynomials and Polynomial Functions 348
Group Activity 358
emPOWERme: The Right Time and Place for Homework 360
Chapter 6 Summary 361
Chapter 6 Review Exercises 363
Chapter 6 Test 366
Cumulative Review for Chapters 1–6 367

CHAPTER 7 Factoring Polynomials 368

Study Strategies: Working with a Study Group 369
Section 7.1 The Greatest Common Factor and Factoring by Grouping 372
Section 7.2 Factoring Trinomials 382
Section 7.3 Special Factoring Techniques 394
Putting It All Together 404
Section 7.4 Solving Quadratic Equations by Factoring 408
Section 7.5 Applications of Quadratic Equations 418
Group Activity 429
emPOWERme: What Is My Studying Style? 431
Chapter 7 Summary 432
Chapter 7 Review Exercises 434
Chapter 7 Test 436
Cumulative Review for Chapters 1–7 437

CHAPTER 8 Rational Expressions, Equations, and Functions 438

Study Strategies: The Writing Process 439
Section 8.1 Simplifying, Multiplying, and Dividing Rational Expressions and Functions 441
Section 8.2 Adding and Subtracting Rational Expressions 454
Section 8.3 Simplifying Complex Fractions 468
Section 8.4 Solving Rational Equations 478
Putting It All Together 489
Section 8.5 Applications of Rational Equations 496
Section 8.6 Variation 506
Group Activity 514
emPOWERme: Writing Clearly 516
Chapter 8 Summary 517
Chapter 8 Review Exercises 522
Chapter 8 Test 525
Cumulative Review for Chapters 1–8 526

CHAPTER 9 Radicals and Rational Exponents 527

Study Strategies: Know Your School 528
Section 9.1 Radical Expressions and Functions 532
Section 9.2 Rational Exponents 546
Section 9.3 Simplifying Expressions Containing Square Roots 555
Section 9.4 Simplifying Expressions Containing Higher Roots 566
Section 9.5 Adding, Subtracting, and Multiplying Radicals 574
Section 9.6 Dividing Radicals 582
Putting It All Together 594
Section 9.7 Solving Radical Equations 599
Section 9.8 Complex Numbers 608
Group Activity 618
emPOWERme: My School 619
Chapter 9 Summary 620
Chapter 9 Review Exercises 625
Chapter 9 Test 627
Cumulative Review for Chapters 1–9 628

CHAPTER 10 Quadratic Equations and Functions 629

Study Strategies: Developing Financial Literacy 630
Section 10.1 The Square Root Property and Completing the Square 632
Section 10.2 The Quadratic Formula 645
Putting It All Together 654
Section 10.3 Equations in Quadratic Form 658
Section 10.4 Formulas and Applications 667
Section 10.5 Quadratic Functions and Their Graphs 675
Section 10.6 Application of Quadratic Functions and Graphing Other Parabolas 689
Section 10.7 Quadratic and Rational Inequalities 702
Group Activity 713
emPOWERme: Determine Your Saving Style 715
Chapter 10 Summary 716

Chapter 10 Review Exercises 720
Chapter 10 Test 723
Cumulative Review for Chapters 1–10 724

CHAPTER 11 Exponential and Logarithmic Functions 725

Study Strategies: Using the Internet for Learning 726

Section 11.1 Composite and Inverse Functions 728
Section 11.2 Exponential Functions 744
Section 11.3 Logarithmic Functions 755
Section 11.4 Properties of Logarithms 768
Section 11.5 Common and Natural Logarithms and Change of Base 778
Section 11.6 Solving Exponential and Logarithmic Equations 790
Group Activity 802
emPOWERme: Should You Use the Internet to Supplement Your Learning? 804
Chapter 11 Summary 805
Chapter 11 Review Exercises 810
Chapter 11 Test 813
Cumulative Review for Chapters 1–11 814

CHAPTER 12 Nonlinear Functions, Conic Sections, and Nonlinear Systems 815

Study Strategies: Improving Your Memory 816

Section 12.1 Graphs of Other Useful Functions 818
Section 12.2 The Circle 829
Section 12.3 The Ellipse 837
Section 12.4 The Hyperbola 844
Putting It All Together 855
Section 12.5 Nonlinear Systems of Equations 859
Section 12.6 Second-Degree Inequalities and Systems of Inequalities 866
Group Activity 872
emPOWERme: How Is My Memory? 873
Chapter 12 Summary 874
Chapter 12 Review Exercises 877
Chapter 12 Test 878
Cumulative Review for Chapters 1–12 879

Chapter 13 and the Appendix are available online

CHAPTER 13 Sequences and Series 1

Section 13.1 Sequences and Series 2
Section 13.2 Arithmetic Sequences and Series 14
Section 13.3 Geometric Sequences and Series 25
Section 13.4 The Binomial Theorem 37
Chapter 13 Summary 46
Chapter 13 Review Exercises 49
Chapter 13 Test 52
Cumulative Review for Chapters 1–13 53

APPENDIX

Section A.1 Review of Fractions A-1
Section A.2 Geometry Review A-11
Section A.3 Determinants and Cramer's Rule A-23
Section A.4 Synthetic Division and the Remainder Theorem A-32

This appendix is available online at www.connectmath.com and www.mcgrawhillcreate.com.

Student Answer Appendix SA-1
Instructor Answer Appendix (Annotated Instructor Edition only) IA-1
Index I-1