Table of Contents

CHAPTER 1

The Real Number System and Geometry 1

Study Strategies: The P.O.W.E.R. Framework 2

Section 1.1 Review of Fractions 4
Section 1.2 Exponents and Order of
Operations 17

Section 1.3 Geometry Review 23

This section gives students the opportunity to relearn and practice geometry before getting to applications later in the book that will require this knowledge. It helps them make connections to other math skills they will need and breaks down the information into smaller pieces for easier understanding.

Section 1.4 Sets of Numbers and Absolute Value 34 Section 1.5 Addition and Subtraction of Real Numbers 43 Section 1.6 Multiplication and Division of Real Numbers 51 Section 1.7 Properties of Real Numbers 59 Section 1.8 Simplifying Algebraic Expressions 69 emPOWERme: Measuring Your Math Confidence 76

Chapter 1 Review Exercises 81
Chapter 1 Test 83

CHAPTER 2

Linear Equations and Inequalities 85

Study Strategies: Reading Math (and Other) Textbooks 86

Section 2.1 Solving Linear Equations Part I 88

Section 2.2 Solving Linear Equations
Part II 96

Section 2.3 Solving Linear Equations
Part III 102

Section 2.4 Applications of Linear Equations 111

Section 2.5 Geometry Applications and Solving Formulas 121

Section 2.6 Ratios and Proportions 135
Section 2.7 Applications of Percents 143

Sections will begin by teaching students the arithmetic before relating it to algebra. If students can't understand the arithmetic, they will find it next to impossible to solve an algebra problem.

Section 2.8 Solving Linear Inequalities in One Variable 151
emPOWERme: Discover Your
Reading Style 161
Chapter Summary 162
Chapter 2 Review Exercises 167
Chapter 2 Test 169
Cumulative Review for

Chapters 1-2 170

CHAPTER 3

Linear Equations in Two Variables 171

Study Strategies: Time Management 172

Section 3.1 Introduction to Linear Equations in Two Variables 174

Section 3.2 Graphing by Plotting Points and Finding Intercepts 188

Section 3.3 The Slope of a Line 199

Section 3.4 The Slope-Intercept Form of a Line 210

Section 3.5 Writing an Equation of a Line 219

emPOWERme: Find Your Time

Style 232

Chapter Summary 233

Chapter 3 Review Exercises 237

Chapter 3 Test 239 Cumulative Review for Chapters 1-3 240

CHAPTER 4 Linear Equations and Inequalities in Two Variables 241

Study Strategies: Taking Notes in Class 242

Section 4.1 Solving Systems by Graphing 244

Section 4.2 Solving Systems by the Substitution Method 254

Section 4.3 Solving Systems by the Elimination Method 262

Putting It All Together 271

Section 4.4 Applications of Systems of Two Equations 273

Section 4.5 Linear Inequalities in Two Variables 286

emPOWERme: Evaluate Your Class Notes 298

Chapter Summary 299

Chapter 4 Review Exercises 303

Chapter 4 Test 305 Cumulative Review for Chapters 1-5 306

CHAPTER 6 Polynomials 345

Study Strategies: Doing Math Homework 346

Section 6.1 Addition and Subtraction of Polynomials 348

Section 6.2 Multiplication of Polynomials 357

Section 6.3 Dividing a Polynomial by a Monomial 366

Division tends to be a struggle for students but it is easier digest if it is broken up, as we have done here.

Section 6.4 Dividing a Polynomial by a

Polynomial 370

emPOWERme: What's Different

About College? 377 Chapter Summary 379

Chapter 6 Review Exercises 380

Chapter 6 Test 382 Cumulative Review for Chapters 1-6 383

CHAPTER 5 Rules of Exponents 307

Study Strategies: Taking Math Tests 308

Rules of Exponents is one of the more difficult topics for students. We give the material its own chapter and then break the topic out into more manageable pieces. Students are given a chance to *practice* the easier parts first before progressing to harder topics.

Section 5.1 Basic Rules of Exponents

Part A: The Product Rule and Power Rules 310

Power Rules 310

Part B: Combining the Rules 317

Section 5.2 Integer Exponents

νi

Part A: Real-Number Bases 319

Part B: Variable Bases 322

Section 5.3 The Quotient Rule 326

Putting It All Together 329

Section 5.4 Scientific Notation 332

emPOWERme: Math Test Preparation Checklist 340

Chapter Summary 341

Chapter 5 Review Exercises 342

Chapter 5 Test 344 Cumulative Review for Chapters 1-5 344

CHAPTER 7

Factoring Polynomials 385

Study Strategies: Making Academic Choices 386

Section 7.1 The Greatest Common Factor and Factoring by Grouping 388

Section 7.2 Factoring Trinomials of the Form

 $x^2 + bx + c$ 398

We help students make the connection here by starting off the chapter with exercises that are purely arithmetic.

Section 7.3 Factoring Trinomials of the Form

 $ax^2 + bx + c (a \neq 1)$ 405

Section 7.4 Factoring Special Trinomials and

Binomials 413

Putting It All Together 420

Section 7.5 Solving Quadratic Equations by

Factoring 423

Section 7.6 Applications of Quadratic

Equations 432

emPOWERme: Identify Major

Attractions 443

Chapter Summary 445

Chapter 7 Review Exercises 447

Chapter 7 Test 449 Cumulative Review for

Chapters 1-7 450

TABLE OF CONTENTS www.mhhe.com/messersmith

CHAPTER 8 Rational Expressions 451

Study Strategies: Coping with Stress 452

Section 8.1 Simplifying Rational Expressions 455

Section 8.2 Multiplying and Dividing Rational

Expressions 464

Section 8.3 Finding the Least Common

Denominator 470

Finding the Least Common Denominator is a tough concept so we've broken it down and given it its own chapter. If students have a chance to practice on finding the least common denominator first. they will be more successful when they move on to Section 8.4

Section 8.4 Adding and Subtracting Rational Expressions 478

Putting It All Together 486

Section 8.5 Simplifying Complex

Fractions 491 Section 8.6 Solving Rational Equations 500

Section 8.7 **Applications of Rational Equations** and Variation 511

> emPOWERme: Determine Your Risk for Stress-Related Illness 526

Chapter Summary 528

Chapter 8 Review Exercises 533

Chapter 8 Test 535 **Cumulative Review for Chapters 1-8** 536

CHAPTER 9 Roots and Radicals 537

Study Strategies: Working with a Study

Group 538

Section 9.1 Finding Roots 541

Section 9.2 Simplifying Radicals: The Product and Quotient Rules 551

We've broken this chapter down into bite-sized pieces before putting it all together in Section 9.4

Section 9.3 Adding and Subtracting

Radicals 563

Section 9.4 Combining Operations on

Radicals 568

Section 9.5 Dividing Radicals 574 Section 9.6 Solving Radical

Equations 586 emPOWERme: Form a

Study Group 595 Chapter Summary 596

Chapter 9 Review Exercises 599

Chapter 9 Test 600 **Cumulative Review for Chapters 1-9** 601

CHAPTER 10 Quadratic Equations 602

Study Strategies: Creating Visuals 603

Section 10.1 Solving Quadratic Equations Using the Square Root Property 605

Section 10.2 Solving Quadratic Equations by Completing the Square 612

Section 10.3 Solving Quadratic Equations Using the Quadratic Formula 620

Putting It All Together 628 Section 10.4 Graphs of Quadratic Equations 631

Section 10.5 Introduction to Functions 639

emPOWERme: What's Your Learning Style? 652 Chapter Summary 654

Chapter 10 Review Exercises 657

Chapter 10 Test 658 **Cumulative Review for** Chapters 1-10 659

APPENDIX

Section A.1 Section A.2 Decimals A-1 Percents A-12

Section A.3

Factoring the Sum and Difference of Two Cubes A-19

Student Answer Appendix SA-1 **Instructor Answer Appendix**

(AIE only) IA-1 Credits C-1 Index I-1

TABLE OF CONTENTS www.mhhe.com/messersmith vii