

# *Algebra 1*

by Elayn Martin-Gay, with contributions from Robert Blitzer

## **Chapter 1: Review for Real Numbers**

- 1.1 Tips for Success in Mathematics
- 1.2 Symbols and Sets of Numbers
- 1.3 Fractions
- 1.4 Introduction to Variable Expressions and Equations
- 1.5 Adding Real Numbers
- 1.6 Subtracting Real Numbers

*Integrated Review: Operations on Real Numbers*

- 1.7 Adding and Subtracting Matrices
  - 1.8 Multiplying and Dividing Real Numbers
  - 1.9 Properties of Real Numbers
- Extension: Probability and Odds

## **Chapter 2: Solving Equations and Problem Solving**

- 2.1 Simplifying Algebraic Expressions
- 2.2 The Addition Property of Equality
- 2.3 The Multiplication Property of Equality
- 2.4 Solving Linear Equations

*Integrated Review: Solving Linear Equations*

- 2.5 An Introduction to Problem Solving
  - 2.6 Formulas and Problem Solving
  - 2.7 Percent and Problem Solving
  - 2.8 Mixture and Distance Problem Solving
- Extension: Inductive and Deductive Reasoning

## **Chapter 3: Graphs and Functions**

- 3.1 Reading Graphs and the Rectangular Coordinate System
- 3.2 Graphing Linear Equations
- 3.3 Intercepts
- 3.4 Slope and Rate of Change

*Integrated Review: Summary on Slope and Graphing Linear Equations*

- 3.5 Equations of Lines
- 3.6 Functions
- 3.7 Graphing Linear Functions
- 3.8 Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions

## **Chapter 4: Solving Inequalities and Absolute Value Equations and Inequalities**

- 4.1 Linear Inequalities and Problem Solving
- 4.2 Compound Inequalities

*Integrated Review: Linear and Compound Inequalities*

- 4.3 Absolute Value Equations

- 4.4 Absolute Value Inequalities
- 4.5 Graphing Linear Inequalities

### **Chapter 5: Solving Systems of Linear Equations and Inequalities**

- 5.1 Solving Systems of Linear Equations by Graphing
- 5.2 Solving Systems of Linear Equations by Substitution
- 5.3 Solving Systems of Linear Equations by Addition
- Integrated Review: Solving Systems of Equations*
- 5.4 Systems of Linear Equations and Problem Solving
- 5.5 Systems of Linear Inequalities
- 5.6 Frequency Distributions, Histograms, and Stem-and-Leaf Plots
- 5.7 Mean, Median, and Mode
- Extension: Box-and-Whisker Plots

### **Chapter 6: Exponents and Polynomials**

- 6.1 Exponents
- 6.2 Adding and Subtracting Polynomials
- 6.3 Multiplying Polynomials
- 6.4 Special Products
- Integrated Review: Exponents and Operations on Polynomials*
- 6.5 Negative Exponents and Scientific Notation
- 6.6 Graphing Exponential Functions and Using the Compound Interest Formula
- 6.7 Exponential Growth and Decay Functions
- 6.8 Dividing Polynomials

### **Chapter 7: Factoring Polynomials**

- 7.1 The Greatest Common Factor and Factoring by Grouping
- 7.2 Factoring Trinomials of the Form  $x^2 + bx + c$
- 7.3 Factoring Trinomials of the Form  $ax^2 + bx + c$  and Perfect Square Trinomials
- 7.4 Factoring Trinomials of the Form  $ax^2 + bx + c$  by Grouping
- 7.5 Factoring Binomials
- Integrated Review: Choosing a Factoring Strategy*
- 7.6 Solving Quadratic Equations by Factoring
- 7.7 Quadratic Equations and Problem Solving

### **Chapter 8: Rational Expressions**

- 8.1 Simplifying Rational Expressions
- 8.2 Multiplying and Dividing Rational Expressions
- 8.3 Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator
- 8.4 Adding and Subtracting Rational Expressions with Unlike Denominators
- 8.5 Solving Equations Containing Rational Expressions
- Integrated Review: Summary on Rational Expressions*
- 8.6 Proportion and Problem Solving with Rational Equations
- 8.7 Variation and Problem Solving

## 8.8 Graphing Rational Functions by Transformations

### **Chapter 9: Roots, Radicals, and Trigonometric Ratios**

9.1 Introduction to Radicals and Radical Functions

9.2 Simplifying Radicals

9.3 Adding and Subtracting Radicals

9.4 Multiplying and Dividing Radicals

*Integrated Review: Simplifying Radicals*

9.5 Solving Equations Containing Radicals

9.6 Radical Equations and Problem Solving

9.7 Right Triangle Trigonometry

### **Chapter 10: Quadratic Equations**

10.1 Solving Quadratic Equations by the Square Root Property

10.2 Solving Quadratic Equations by Completing the Square

10.3 Solving Quadratic Equations by the Quadratic Formula

*Integrated Review: Summary on Solving Quadratic Equations*

10.4 Graphing Quadratic Equations

10.5 Linear, Quadratic, and Exponential Models

### **Appendices**

Appendix A: Venn Diagrams

Appendix B: Survey Problems

Appendix C: The Fundamental Counting Principle

Appendix D: Permutations

Appendix E: Combinations

Appendix F: Arithmetic and Geometric Sequences

Appendix G: Practice Final Exam

### **Answers to Selected Exercises**