Class: Algebra I

Teacher: Osnat Stone

Dates: June 20–July 29, 2021 (6 weeks)

Time: 9:30 a.m.–12:30 p.m. (87 hours total)

Course Goal: To provide an equivalent full-year study of first-year Algebra to students wishing to prepare a foundation for advanced high school coursework in mathematics or to preview that material in preparation for the upcoming school year. Students should expect to have their reasoning abilities challenged while they enhance their abilities in the mechanics of the course.

Organization: In the summer curriculum, we use the Pearson Prentice Hall *Algebra 1* text written by Smith, Charles, Dossey and Bittinger as a base. Because the text stresses the mechanics of algebra and does not head off into several different directions, it is highly suitable for a six-week summer course. The class meets three hours daily for the six-week session. The course covers eleven chapters of the text:

- **Chapter 3: Equation**
  - 3-1: The Addition Property of Equality
  - 3-2: The Multiplication Property of Equality
  - 3-3: Using the Properties Together
  - 3-4: Expressions and Equations
  - 3-5: More on Solving Equations
  - 3-6: Clearing an Equation of Fractions or Decimals
  - 3-7: Formulas
  - 3-8: Solving Equations Involving Absolute Value
  - 3-9: Proportions
  - 3-10: Using Percent
  - 3-11: More Expressions and Equations
  - 3-12: Reasoning Strategies: Make an Organized List

- **Chapter 4: Inequalities**
  - 4-1: Inequalities and Their Graphs
  - 4-2: The Addition Property of Inequalities
  - 4-3: The Multiplication Property of Inequalities
  - 4-4: Using the Properties Together
  - 4-5: Using Inequalities

- 4-6: Reasoning Strategies: Use Logical Thinking

- **Chapter 5: Exponents and Polynomials**
  - 5-1: Exponents
  - 5-2: More with Exponents
  - 5-3: Multiplying and Dividing Monomials
  - 5-4: Scientific Notation
  - 5-5: Polynomials
  - 5-6: More on Polynomials
  - 5-7: Addition of Polynomials
  - 5-8: Subtraction of Polynomials
  - 5-9: Multiplication of Monomials and Binomials
  - 5-10: Multiplying Binomials: Special Products
  - 5-11: Multiplying Polynomials
  - 5-12: Reasoning Strategies: Make a Table, Look for a Pattern

- **Chapter 6: Polynomials and Factoring**
  - 6-1: Factoring Polynomials
  - 6-2: Differences of Two Squares
  - 6-3: Trinomial Squares
  - 6-4: Factoring $x^2 + bx + c$
  - 6-5: Factoring $ax^2 + bx + c$
  - 6-6: Factoring by Grouping
  - 6-7: Factoring: A General Strategy
  - 6-8: Solving Equations by Factoring
  - 6-9: Using Equations that Factor

- **Chapter 7: Graphs and Linear Equations (all but 7-9 proof)**
  - 7-1: Graphing Ordered Pairs
  - 7-2: Graphing Equations
  - 7-3: Linear Equations and Their Graphs
  - 7-4: Slope
  - 7-5: Equations and Slope
  - 7-6: Finding the Equation of a Line
  - 7-7: Fitting Equations to Data
  - 7-8: Parallel and Perpendicular Lines
  - 7-10: Reasoning Strategies: Simplify the Problem

- **Chapter 8: Systems of Equations**
  - 8-1: Solving Systems of Equations by Graphing

- 8-2: The Substitution Method
- 8-3: The Addition Method
- 8-4: Using Systems of Equations
- 8-5: Motion Problems
- 8-6: Digit and Coin Problems

- **Chapter 9: Inequalities and Absolute Value**
  - 9-1: Sets, Intersections, and Unions
  - 9-2: Compound Sentences
  - 9-3: Equations and Absolute Value
  - 9-4: Inequalities and Absolute Value
  - 9-5: Inequalities in Two Variables
  - 9-6: Graphing Systems of Linear Inequalities

- **Chapter 10: Rational Expressions and Equalities**
  - 10-1: Simplifying Rational Expressions
  - 10-2: Multiplying Rational Expressions
  - 10-3: Dividing Rational Expressions
  - 10-4: Addition and Subtraction: Like Denominators
  - 10-5: Addition and Subtraction: Unlike Denominators
  - 10-6: Solving Rational Equations
  - 10-7: Using Rational Equations
  - 10-8: Mixture Problems
  - 10-9: Dividing Polynomials

- **Chapter 11: Radical Expressions and Equations**
  - 11-1: Real Numbers
  - 11-2: Radical Expressions
  - 11-3: Simplifying Radical Expressions
  - 11-4: Multiplying Radical Expressions
  - 11-5: Dividing and Simplifying
  - 11-6: Addition and Subtraction
  - 11-7: The Pythagorean Theorem
  - 11-8: Using the Pythagorean Theorem
  - 11-9: Equations with Radicals

- **Chapter 12: Relations and Functions**
  - 12-1: Relations and Functions
  - 12-2: Functions and Graphs
  - 12-3: Linear Functions

- 12-4: Quadratic Functions
- 12-5: Direct Variation
- 12-6: Inverse Variation
- 12-7: Joint and Combined Variation

- **Chapter 13: Quadratic Equations**
  - 13-1: Introduction to Quadratic Equations
  - 13-2: More Solving Quadratic Equations
  - 13-3: Solving by Completing the Square
  - 13-4: The Quadratic Formula
  - 13-5: Solving Rational Equations
  - 13-6: Solving Radical Equations
  - 13-7: Using Quadratic Equations

Assessment:

- Daily quizzes
- Midterm Examination
- Final Examination
- Only homework assigned will be to study for midterm and final exams