

## **a-g Algebra 1 A & B**

### **TRANSCRIPT TITLES/ TRANSCRIPT CODES:**

a-g Algebra 1A	5E1001
a-g Algebra 1B	5E1006

### **COURSE DESCRIPTION**

In this textbook-based, first year algebra course students will cover arithmetic review, solving linear equations and inequalities in one variable, graphing linear equations and inequalities in two variables. This course covers all the California Mathematics Content Standards for Algebra 1. Student will learn to reason symbolically and effectively use the tools and language of mathematics. Students will learn to apply algebraic skills to a wide variety of problem solving situations.

**PREREQUISITES:** Pre-Algebra

**REQUIRED TEXTBOOK:** HOLT CALIFORNIA ALGEBRA 1

### **COURSE PURPOSE**

In this first year, California standards-based, algebra course, students will:

- master the California mathematics content standards for algebra 1.
- learn to reason symbolically.
- effectively use the tools and language of mathematics.
- write, solve, and graph linear and quadratic equations, including systems of two linear equations in two unknowns.
- solve quadratic equations by factoring, completing the square, graphically, or by application of the quadratic formula.
- study monomial and polynomial expressions, inequalities, exponents, functions, rational expressions, ratio, and proportion.
- apply algebraic skills in a wide variety of problem-solving situations.

### **COURSE OUTLINE**

CHAPTERS (California State Algebra Standards covered)

Content in sections

#### **1. FOUNDATIONS OF ALGEBRA (1.0, 1.1, 2.0, 24.3, 25.1)**

- The Language of Algebra (Variables and Expressions; Adding and Subtracting, Multiplying and Dividing Real Numbers; Powers and Exponents; Roots and Irrational Numbers)
- The Tools of Algebra (Properties of Real Numbers, Simplifying Expressions)

#### **2. EQUATIONS (3.0, 4.0, 5.0, 15.0, 25.3)**

- Equations (Solving one-, two, and multi-step equations; true equations; solving equations with variable on both sides)
- Proportions and Formulas (Solving proportions, solving literal equations for a variable, solving absolute value equations)

#### **3. INEQUALITIES (3.0, 4.0, 5.0, 24.2, 25.2)**

- Simple Inequalities (graphing and writing inequalities; solving inequalities by adding subtracting, multiplying or dividing)
- Multi-Step and Compound Inequalities (solving two-step and multi-step inequalities, solving inequalities

with variables on both sides, solving compound inequalities, solving absolute-value inequalities)

#### 4. FUNCTIONS (16.0, 17.0, 18.0)

- Function Concepts (graphing relationships; relations and functions; writing and graphing functions; connecting equations, tables, and graphs)
- Applying Functions (scatter plots and trend lines, arithmetic sequences)

#### 5. LINEAR FUNCTIONS (6.0, 7.0, 8.0)

- Characteristics of Linear Functions (Linear equations and functions, using intercepts, exploring constant changes, slope, direct variation)
- Using Linear Functions (slope-intercept form, point-slope form, slopes of parallel and perpendicular lines)

#### 6. SYSTEMS OF EQUATIONS AND INEQUALITIES (6.0, 8.0, 9.0, 15.0)

- Systems of Linear Equations (solving linear equations by using a spreadsheet, solving systems by graphing, model systems of linear equations, solving systems by substitution, solving systems by elimination, solving special systems, applying systems)
- Linear Inequalities (solving linear inequalities, solving systems of linear inequalities)

#### 7. EXPONENTS AND POLYNOMIALS (2.0, 10.0)

- Exponents (integer exponents, powers of 10 and scientific notation, multiplication and division properties of exponents, fractional exponents)
- Polynomials (polynomials; adding, subtracting, multiplying and dividing polynomials; special products of binomials)

#### 8. FACTORING POLYNOMIALS (11.0, 25.1)

- Factoring Methods (factors and greatest common factors, factoring by GCF, factoring  $x^2 + bx + c$ ; factoring  $ax^2 + bx + c$ )
- Applying Factoring Methods (factoring special products, choosing a factoring method)

#### 9. QUADRATIC FUNCTIONS AND EQUATIONS (14.0, 19.0, 20.0, 21.0, 22.0, 23.0)

- Quadratic Functions (quadratic equations and functions, exploring the axis of symmetry, characteristics of quadratic functions, graphing quadratic functions)
- Solving Quadratic Equations (solving quadratic equations by graphing; exploring roots, zeros, and x intercepts; solving quadratic equations by factoring; solving quadratic equations by using square roots; completing the square; the quadratic formula; the discriminant)

#### 10. RATIONAL FUNCTIONS AND EQUATIONS (10.0, 12.0, 13.0, 15.0)

- Rational Functions and Expressions (Inverse variation, rational functions, simplifying rational expressions, graphing rational functions)
- Operations with Rational Expressions (multiplying, dividing, adding and subtracting rational expressions; solving rational equations; applying rational equations)

#### 11. EXPONENTIAL AND RADICAL FUNCTIONS (1A2.0, 1A17.0, 12.0, 2A22.0)

- Radical Functions and Equations (square-root functions; radical expressions; adding, subtracting, multiplying, and dividing radical expressions, solving radical expressions)
- Exponential Functions (geometric sequences; exponential functions; exponential growth and decay; linear, quadratic, and exponential models)

## **KEY ASSIGNMENTS**

Student must complete these specific assignments:

1. The student will read introduction of each new topic. The student will review the examples given with his/her complete solutions shown and will then complete the practice problems for the new topics.
2. The student will complete daily problem sets and review sets of previous topics.
3. The student will complete the "College Entrance Exam Practice" and "Mastering the Standards" found at the end of each chapter.
4. The student will complete at least three "Challenge and Extend" problems at the end of every chapter.
5. The student will take chapter tests without outside assistance or use of notes or the text.
6. The student's Education Specialist and Subject Matter Expert (SME) will review work on a regular basis, and the student's written samples will be kept in a portfolio.

## **INSTRUCTIONAL METHODS AND/OR STRATEGIES**

Instructional methods and/or strategies may include, but are not limited, to the following techniques:

- Demonstration
- Multi-media presentations
- Textbook exercises
- Guided practice
- Tutorials
- Discussion
- Hands-on mathematical investigation
- Internet research
- Library research
- Lecture
- Regular access to a Subject Matter Expert (SME)

## **ASSESSMENT METHODS AND/OR TOOLS**

Methods by which student progress is assessed will be through a variety and/or combination of methods.

The methods available include, but are not limited to:

- Regular review of work by Education Specialist (credentialed teacher)
- Portfolios
- Parent facilitator and Education Specialist observation
- Student demonstrations
- Student grades
- Student work examples
- Written examination
- Research projects
- Regular access to and review of work by the Subject Matter Expert (SME)