



**Online Courses for High School Students**  
1-888-972-6237

## Algebra 1

In this course, students deepen their understanding of linear and exponential relationships by contrasting them with each other. Students also apply linear models to data that exhibit a linear trend. The course also covers analyzing, solving, and using quadratic functions.

**Prerequisite:** Math 8 (or equivalent)

**Course Length:** Two Semesters

**Required Text:** Summit Curriculum Algebra 1: A Reference Guide (E-book is included within the course).

**Materials List:** Texas Instruments TI-84 Plus Graphics Calculator

## Course Outline

### Semester 1

#### *Expressions and Problem Solving*

- Expressions
- Variables
- Equations
- Translating Words into Variable Expressions
- Translating Words into Equations
- Problem Solving
- Dimensional Analysis
- Structure and Meaning

#### *One-Variable Linear Equations and Inequalities*

- Addition and Subtraction Equations
- Multiplication and Division Equations
- Multiple Transformations
- Variables on Both Sides of an Equation
- Applications: Cost Problems
- Transforming Formulas

- Solving Inequalities
- Applications: Inequalities
- Reasoning with Solutions

### ***Two-Variable Linear Equations and Inequalities***

- Graphs of Lines
- Forms of Linear Equations
- Writing Equations of Lines
- Applications: Linear Equations
- Graphing Linear Inequalities
- Systems of Linear Inequalities
- Constraints

### ***Working with Functions***

- Relations
- Functions
- Function Equations
- Linear Functions
- Function Parameters
- Thinking About Domain and Range
- Absolute Value Functions
- Piecewise Functions
- Step Functions

### ***Radicals and Exponents***

- Irrational Numbers
- Simplifying Radical Expressions
- Properties of Rational and Irrational Numbers
- Properties of Exponents
- Exponential Expressions and Equations
- Applications: Growth and Decay

### ***Exponential Functions***

- Graphing Exponential Functions
- Features of Exponential Functions
- Average Rate of Change
- Comparing Models
- Multiple Representations

## ***Sequences and Modeling with Functions***

- Sequences and Patterns
- Arithmetic Sequences
- Geometric Sequences
- Applications: Sequences
- Function Parameters
- Writing Function Equations

## **Semester 2**

### ***Systems of Equations***

- Graphs of Systems
- Approximating Solutions with Graphs
- Systems of Functions
- Substitution Method
- Linear Combination
- Linear Combination with Multiplication
- Justifying Linear Combination
- Applications: Systems of Linear Equations

### ***Polynomials***

- Overview of Polynomials
- Adding and Subtracting Polynomials
- Multiplying Monomials
- Multiplying Polynomials by Monomials
- Multiplying Polynomials
- The FOIL Method
- Polynomials and Arithmetic
- Common Factors of Polynomials
- Factoring Perfect Squares
- Factoring Differences of Squares
- Factoring Quadratic Trinomials
- Finding Roots of a Polynomial

### ***Quadratic Equations***

- Solving Perfect Square Equations
- Completing the Square
- The Quadratic Formula
- Solving Quadratic Equations
- Formulas with Quadratics

- Applications: Area Problems

### ***Quadratic Functions***

- Graphing Quadratic Functions
- Properties of Quadratic Functions
- Functions and Transformations
- Quadratic Rates of Change
- Linear/Quadratic Systems
- Applications: Quadratic Functions

### ***Univariate Data***

- Measures of Center
- Frequency Distributions
- Variability
- Selecting Measures of Center
- Outliers

### ***Bivariate Data***

- Interpreting Two-Way Tables
- Scatter Plots
- Association
- Correlation
- Fitting a Line to Data
- Least Squares Regression
- More Regression
- Residuals