

# Summer Advancement

## Honors Algebra 2

**Instructor:** Mrs. Kee

**Course Length:** 20 Days

**Standards:** Alabama Course of Study – Mathematics (Algebra II with Statistics)

### Course Description

This accelerated course will cover all essential topics of Algebra 2, including functions, polynomials, rational expressions, logarithms, sequences, and probability. It is designed for advanced students who can grasp concepts quickly.

### Course Breakdown

#### Week 1: Foundations & Functions

- **Day 1:** Algebraic Expressions, Equations, & Inequalities Review
  - Properties of real numbers
  - Solving linear & absolute value equations
  
- **Day 2:** Functions, Equations, & Graphs
  - Relations and Functions
  - Direct Variation
  - Piecewise Functions
  - Families of Functions
  
- **Day 3:** Linear Systems
  - Solving systems
  - Systems of Inequalities
  - Linear Programming
  - Matrices
  
- **Day 4:** Quadratic Functions and Equations
  - Factoring Quadratics
  - Quadratic Formula
  - Modeling with Quadratic Functions
  
- **Day 5:** Complex Number Systems
  - Operations with Complex Numbers
  - Organizing the Real and Complex Numbers
  - Properties with Complex Numbers

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### Week 2: Polynomial, Radical, Rational, Exponential, & Logarithmic Functions

- **Day 6:** Polynomials and Polynomial Functions
  - Polynomials, Linear Factors, and Zeros
  - Solving Polynomial Equations
  - Theorems About Roots of Polynomial Equations
- **Day 7:** Radical & Rational Exponents
  - Roots and Radical Expressions
  - Binomial Radical Expressions
  - Solving radical equations, extraneous solutions
- **Day 8:** Exponential & Logarithmic Functions
  - Exploring Exponential Models
  - Properties of Exponential Functions
  - Exponential and Logarithmic Equations
- **Day 9:** Rational Functions
  - Rational Functions and Their Graphs
  - Adding and Subtracting Rational Expressions
  - Solving Rational Equations
- **Day 10:** Function Review; Midterm
  - Polynomials and Polynomial Functions
  - Radical & Rational Exponents
  - Exponential & Logarithmic Functions
  - Rational Functions

### Week 3: Sequences, Series, & Probability

- **Day 11:** Sequences & Series
  - Sequences
  - Arithmetic vs. Geometric Sequences
  - Sequence and Series Application

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- **Day 12:** Probability
  - Permutations & Combinations
  - Theoretical & Experimental Probability
  - Independent, Dependent, and Compound Events
- **Day 13:** Data Analysis & Statistics
  - Measures of Central Tendency
  - Analyzing Data
  - Distributions
- **Day 14:** Statistical Application & Review
  - Standard deviation, z-scores, data analysis
- **Day 15:** Quadratic Relations and Conic Sections
  - Parabolas
  - Circles
  - Ellipses
  - Hyperbolas

### Week 4: Advanced Topics & Review

- **Day 16:** Intro to Trigonometry
  - Pythagorean Theorem
  - Special Right Triangles
  - Trigonometric Functions
  - Angles and the Unit Circle
- **Day 17:** Trigonometry Part II
  - Graphing Trigonometric Functions
  - Trigonometric Identities
  - Sum and Difference of Angle Identities
  - Double-Angle and Half-Angle Identities
  - Solving Trigonometric Equations

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### Honors Algebra 2

- **Day 18:** Review & Mixed Practice
  - Comprehensive problem-solving session
  - Final Study Guide/Review Activities
- **Day 19:** Practice Test & Analysis
  - Full-length Algebra 2 Practice Exam
- **Day 20:** Final Assessment & Reflection

## Grading Policy

- Homework & Classwork: **25%**
- Quizzes {WEEKLY} : **20%**
- Mid Term Test {DAY 10}: **25%**
- Final Exam {DAY 20}: **30%**

## Expectations

- Students should review material daily due to the accelerated pace.
- Participation in discussions and problem-solving is required.
- Calculators are permitted when appropriate.
- Class time will consist of lectures/notes, reinforcement videos, hands-on activities, check-in quizzes, and practice sets.