# Summer Advancement
# Algebra 1

**Instructor: Joshua Gatlin**
**Course Length:** 20 Days
**Standards:** Alabama Course of Study – Mathematics (Algebra I w/ Probability)

## Course Description

This course will cover all essential topics of Algebra 1, including equations, functions, systems of equations, and polynomials. This course covers all Algebra 1 standards, and is designed for students taking Algebra 1 for the first time or for students who need concepts reinforced from a previous Algebra course.

**Week 1: Equation and Function Foundations**

- **Day 1:** Foundations of Algebra
    - Understanding variables, expressions, and equations
    - Order of operations (PEMDAS)
    - Properties of real numbers (commutative, associative, distributive)

- **Day 2: Solving Linear Equations**
    - One-step, two-step, and multi-step equations
    - Equations with variables on both sides

- **Day 3: Solving Linear Inequalities**
    - Graphing inequalities on a number line
    - One-step, two-step, and multi-step inequalities
    - Inequalities with variables on both sides

- **Day 4: Introduction to Functions**
    - Definition and notation of functions
    - Domain and range
    - Evaluating functions

- **Day 5: Linear Functions**
    - Slope and Slope Formula
    - Slope-Intercept Form
    - Point-Slope Form

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**Week 2: Relationships, Systems, and Polynomials**

- **Day 6: Applying Linear Relationships**
  - Equations of Parallel and Perpendicular Lines
  - Transformations
  - Piecewise Functions

- **Day 7: Systems of Linear Equations**
  - Solving by graphing, substitution, and elimination

- **Day 8: Systems of Linear Inequalities**
  - Solving by graphing
  - Substitution method
  - Elimination method

- **Day 9: Exponents and Polynomials**
  - Properties of exponents
  - Scientific notation
  - Operations of Polynomials

- **Day 10: Factoring Polynomials**
  - Greatest common factor (GCF) and factoring by grouping
  - Factoring trinomials
  - Difference of Squares
  - Perfect Square Trinomials

**Week 3: Quadratics, Radicals, and Exponential Functions**

- **Day 11: Quadratic Functions and Equations**
  - Graphing quadratic functions
  - Identifying key features: vertex, axis of symmetry, intercepts
  - Transformations of quadratics

- **Day 12: Solving Quadratic Equations**
  - Solving by Factoring
  - Square Root Method
  - Quadratic formula

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- **Day 13: Radical Expressions and Equations**
  - Simplifying radicals
  - Operations with radical expressions
  - Solving radical equations

- **Day 14: Exponential Functions**
  - Graphing and Writing Exponential Functions
  - Growth and Decay
  - Exponential Applications

- **Day 15: Sequences**
  - Arithmetic and Geometric Sequences

**Week 4: Statistics and Review**

- **Day 16: Data and Statistics**
  - Dot Plots
  - Histograms
  - Comparing Center and Spread

- **Day 17: Probability**
  - Theoretical vs. experimental probability
  - Probability of compound events
  - Permutations and combinations

- **Day 18: Review of Key Concepts**
  - Mixed practice on all major topics
  - Rising Cost of College Project

- **Day 19: Practice Test & Review**
  - Full-length Algebra 1 practice test
  - Strategies for solving problems efficiently

- **Day 20: Final Assessment & Reflection**
  - Cumulative final exam
  - Reflection and review session

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## Grading Policy

- Homework & Classwork: **25%**
- Quizzes {WEEKLY} : **20%**
- Project/Practice Test: **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.