

# Advanced Algebra

Mrs. A. Jones – Room 509

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**Advanced Algebra** is the culminating course in a sequence of three high school courses designed to ensure career and college readiness. It is designed to prepare students for fourth course options relevant to their career pursuits.

## COURSE DESCRIPTION:

Georgia Mathematics focuses on actively engaging the student in the development of mathematical understanding by working independently and cooperatively to solve problems, estimating and computing efficiently, using appropriate tools, concrete models and a variety of representations, and conducting investigations and recording findings. There is a shift toward applying mathematical concepts and skills in the context of authentic problems and student understanding of concepts rather than merely following a sequence of procedures. In mathematics classrooms, students will learn to think critically in a mathematical way with an understanding that there are many different solution pathways and sometimes more than one right answer in applied mathematics. Mathematics is the economy of information. The central idea of all mathematics is to discover how knowing some things leads, via reasoning, to knowing more — without having to commit the information to memory as a separate fact. It is the reasoned, logical connections that make mathematics manageable. The implementation of the Georgia Standards of Excellence in Mathematics places the expected emphasis on sense-making, problem solving, reasoning, representation, modeling, representation, connections, and communication.

**COURSE GOALS:** Upon completion of this course, students should have a firm grasp on graphing and solving various algebraic functions. Below is a breakdown of this course by unit.

### Unit 1 – Quadratics Revisited

- Linear Functions (Review)
- **Complex Numbers**
- **Solving Quadratic Functions**
- Graph Quadratic Functions
- Characteristics of Quadratic Functions (**includes average rate of change**)
- **Transformations of Functions**
- **Rational Exponents**

### Unit 2 – Operations with Polynomials

- **Operations of Polynomials**
- **Operations of Functions**
- **Composition of Functions**
- **Inverse Functions**

### Unit 3 – Polynomial Functions

- **Interpret Polynomial Functions in Context**
- **Find all Zeros/Roots of a Polynomial**
- **Graph Polynomials**
- **Characteristics of Polynomial Graphs**

### Unit 4 – Rational and Radical Relationships

- **Operations of Rational Functions**
- **Create Simple Rational Equations**
- **Solve Rational and Radical Equations (Extraneous Solutions)**
- **Graph Rational, Square Root/Cubic, Absolute Value, and Piecewise (including Step) Functions**

- **Characteristics of Rational, Square Root/Cubic, Absolute Value, and Piecewise (including Step) Graphs (includes average rate of change)**
- **Transformations of Functions**

### Unit 5 – Exponential and Logarithms

- **Write Exponential Functions**
- **Convert to Logarithmic Form**
- **Solve Exponential and Logarithmic Equations**
- **Graph Exponential and Logarithmic Functions**
- **Characteristics of Exponential and Logarithmic Graphs (includes average rate of change)**
- **Transformations of Functions**

### Unit 6 – Mathematical Modeling

- **Geometric Series**
- **Quantity of Interest in a Formula**
- **Equivalent Functions**
- **Compare Functions with Different Representations**

### Unit 7 – Inferences & Conclusions from Data

- **Types of Data Collection**
- **Types of Sample Populations**
- **Comparing Data**
- **Center and Spread**
- **Normal Distribution**
- **Margin of Error**

## GRADING SCALE:

A: 90 & above: Outstanding quality of work, on time, almost all problems worked out correctly

B: 80-89: Above average quality, on time, some mistakes in worked problems

C: 70-79: Average quality, on time, frequent mistakes in worked problems but concepts generally understood

## FINAL EXAM & EXEMPTIONS:

Exams will be given at the end of each semester and will count 20% of the semester grade. Students may exempt semester exams for subjects in which they have an A average with 5 absences or less, a B average with 3 absences or less, or a C average with 0 absences. Students assigned in-school suspension (ISS) or out of school suspension (OSS) are **not** eligible for exemption.

## COURSE ASSESSMENT:

*Nine Weeks Grade* = 50% (Tests) + 50% (Quizzes, class activities, and homework)

*1<sup>st</sup> Semester Grade* = (1<sup>st</sup> 9 weeks + 2<sup>nd</sup> 9 weeks) ÷ 2 x 80% + Semester Exam x 20%

*2<sup>nd</sup> Semester Grade* = (3<sup>rd</sup> 9 weeks + 4<sup>th</sup> 9 weeks) ÷ 2 x 80% + Semester Exam x 20%

## SUPPLIES:

- 1 inch, 3-ring binder
- 4 composition books
- notebook paper, pencils, and highlighters
- ruler with holes to keep in notebook (shows both centimeters and inches)
- TI-36X Pro scientific calculator (If you purchase one, then please cut out the points and turn them in to the math department. Points will be used to redeem items for the school.) The Math Department sells them for \$25. If you want to purchase one, make checks payable to LCHS.
- pouch that zips with holes to keep in notebook to store pencils and calculator
- Kleenex – 2 Boxes – 1 per semester

## RULES/EXPECTATIONS:

- All students are expected to read and abide by the rules listed in the student handbook – Code of Conduct, Behavior Code, Dress Code, and Discipline Procedures.
- Students are expected to comply with basic school protocol such as being prepared and on time for class, maintaining an appropriate noise level, and cleaning up behind oneself.
- No sleeping, eating, drinking, or inappropriate language.
- No **TECHNOLOGY** (cell phones, tablets, etc.) unless approved by teacher.
- Be respectful at **all** times to **all** persons and **all** property.
- Give 100% effort daily!!! You will only get as much as you give.

## Bring Your Own Technology (BYOT):

LCHS encourages the use of technology to aid in educational pursuits. In Advanced Algebra and Advanced Algebra Support, BYOT activities will be incorporated into the lessons from time-to-time. This means that students will be allowed to bring smart phones, tablets, kindles, etc. to class. However, these devices will only be allowed for educational purposes at designated times. During class time, students will not be allowed to use their devices for any type of social networking, texting, making phone calls or taking pictures or videos.