# CVA Honors Advanced Algebra Syllabus

## Class Description

Advanced Algebra is the third course in a sequence of courses designed to ensure career and college readiness. It is intended to prepare students for fourth mathematics course options relevant to their postsecondary pursuits. In Advanced Algebra, students will continue to enhance their data and statistical reasoning skills as they learn specific ways to collect, critique, analyze, and interpret data. Students will learn how to use matrices and linear programming to represent data and to solve contextually relevant problems. Students will strengthen their geometric and spatial reasoning skills as they learn how to solve trigonometric equations using the unit circle. In previous courses, students studied how to use linear and quadratic functions to model real-life phenomena. In Advanced Algebra, students will further develop their functional and graphical reasoning as they explore and analyze structures and patterns for exponential, logarithmic, radical, polynomial, and rational expressions, equations, and functions to further understand the world around them.

This course has three sections: Honors Advanced Algebra A is the first half of the class and includes Units 1-3. Honors Advanced Algebra B is the second half of the class and includes Units 4-7. Honors Advanced Algebra Y is the entire class and includes Units 1-7.

Students taking the **Honors** course will study topics that increase the depth and scope of their study of the concepts of Advanced Algebra.

Click HERE for the Honors Advanced Algebra Class Schedule which outlines the Units, Lessons, and Assessments for this course.

Click HERE for the Advanced Algebra State standards.

## Class Outline

Unit 1: Descriptive and Inferential Statistics

This unit delves into interpretation of statistics, rather than pure computation of statistics. Students will learn best practices to plan, interpret, and critique studies using samples within a population to make inferences about the population, at-large.

Unit 2: Exponential and Logarithmic Functions

Students will find inverses of functions by hand, in models, charts, and graphs and verify by composition or graphing that one function is an inverse of another. Introduction of composition of functions to verify inverses is included as a strategy/method for this unit (in addition to numerical and

graphical verification). Based on what students already know, students will explore logarithmic functions as inverses of exponential functions. They will move into graph logarithmic and exponential functions and identify key features. Students will use logarithmic properties and inverses to solve real-life exponential and logarithmic problems in one variable.

Unit 3: Investigating Radical Functions

In this unit, students will write radical functions as functions with rational exponents and use these to solve real-world problems. Students will analyze key features of radical graphs and will select tools (including technology) to model radical functions. Given real-world situations, students should solve radical/rational exponent equations in one variable (recognizing extraneous solutions) or to graph and analyze radical/rational exponent functions in two variables to arrive at conclusions to real-world problems.

Unit 4: Modeling Polynomial Functions

This unit begins with a deeper exploration into quadratic functions to include those with non-real solutions. Students will solve systems of quadratic equations and perform quadratic regressions. They will perform computations with complex numbers (addition, subtraction, and multiplication) using properties of operations. Moving into exploration of polynomial functions, students will identify the number of zeros and end behavior for any polynomial, or to write a viable equation for the polynomial, given its zeros. Students will graph and identify the key features such as zeros of polynomials of degree greater than 2 either by inspection of a pre-graphed or pre-factored equation, or by using technology.

Unit 5: Investigating Linear Algebra and Matrices

Students will represent real-world data into matrices and perform calculations within a real-world context. Students will have the opportunity to use technology for matrix calculations involving matrices greater than 2x2 in dimension. Students will organize systems of linear equations into a coefficient matrix multiplied by a variable matrix, equal to a constant matrix, and will calculate and use inverse matrices to solve these systems. Students will use linear programming to solve real-world optimization problems.

Unit 6: Trigonometry and the Unit Circle

Students will begin exploring angles within the unit circle as a fraction of the circumference all the way around the unit circle. They will fluently convert between degree measures and radian measures. They will explore the concepts of terminal angles on the unit circle. Students will define and analyze the x (cosine), y (sine), and r (1) values of each angle measure of 30° ($\frac{\pi}{6}$), 45° ($\frac{\pi}{4}$), and 60° ($\frac{\pi}{3}$), and their associated reflected angles within one counterclockwise revolution of the unit circle. Students will also be able to find the sine, cosine, and tangent at these radian measures, as well. Lastly, students will solve simple trigonometric equations.

Unit 7: Exploring Rational Functions

This unit is an introduction to rational functions. In this unit, students will rewrite simple rational expressions, and perform addition, subtraction, multiplication, and division. Students will explore rational functions as models for real-life phenomena.

## CVA Work Policy

- All classwork must be completed and submitted using the links in CTLS by the DUE DATE listed on the Class Schedule.
- Work should be completed in the order it is assigned on the Class Schedule.
- All work submitted on time will be graded within 48 hours.
- Assignments not submitted by the due date will be marked missing. Missing assignments are calculated as zeros in the coursework average. When students submit missing work, the assignment will be graded and calculated into the coursework average.

The CVA term ends prior to the end of the traditional school semester. The final date work will be accepted each term is posted on the CVA website (cobbvirtualacademy.org) and the Class Schedule.

## Grading

Grades for this course are calculated based on category percentages as follows:

| Category | Weight |
|---|---|
| Assessment | 20% |
| Application Activity | 30% |
| Test | 40% |
| Final Exam | 10% |

## CVA Exemption Incentive

To qualify for CVA's exemption incentive and exempt the Final Exam/lowest unit test or major assessment grade, CVA students must:

- Submit ALL assignments on OR before the due date
- Have an 85% coursework average or higher before the final exam
- Have no more than one academic integrity violation

## Academic Integrity

Academic integrity is the cornerstone of learning at CVA and we take the integrity and authenticity of student work very seriously. When academic integrity is maintained, students will make decisions based on values that will prepare them to be productive, meaningful, and ethical citizens.

Students are required to abide by the CVA Academic Integrity Policy. Academic dishonesty in any form will not be tolerated. The CVA Academic Integrity Policy outlines the consequences if students fail to maintain academic integrity in their course. For additional information, the CVA Academic Integrity Policy is posted on the CVA website.

| Consequence | Occurrence | | | |
|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th |
| Parent contact by teacher | ✓ | ✓ | ✓ | ✓ |
| Resubmit work for full credit | ✓ | | | |
| Resubmit work for half credit | | ✓ | | |
| Automatic Zero | | | ✓ | ✓ |
| Parent contact by CVA Administration | | | ✓ | ✓ |
| Mandated proctored exam or course work | | | | ✓ |
| Local school is notified of Academic Integrity violation | | ✓ | ✓ | ✓ |
| Other as designated by CVA or local school administration | ✓ | ✓ | ✓ | ✓ |

## General Information

- The Cobb Teaching and Learning System (CTLS) is the platform used to deliver Cobb Virtual Academy classes.
- Students must earn 100% on the Student Orientation Quiz located inside each CVA Digital Classroom before they begin their Student Coursework.
- All coursework must be submitted through CTLS.
- All CCSD students have access to Microsoft 365 applications and must submit assignments in the requested format.
- Students in all sections of this course will take an online final exam during the window of time published on the CVA website and the Class Schedule.

## Course Specific Information

- Assessments and Application Activities: After reviewing each lesson, students will complete an assessment and/or an application activity online. Each assessment has approximately 10-15 questions. The application activity has free-response questions.
- Tests: Students should carefully review the feedback on graded items and be sure to understand the material prior to beginning the Unit Test.

## Technology Requirements

CTLS is geo-restricted to the United States.

- A modern PC or Mac Computer
    - Lightweight or mobile devices such as Chromebooks, iPads, Android tablets, or smartphones **may not** be compatible with many of our courses.
    - Windows or Mac based computer
- Access to Microsoft 365
- Internet access

## CVA Expectations

### Student

- Maintain consistent access to a computer and internet
- Login to the course daily and review the announcements
- Adhere to the deadlines listed on the Class Schedule
- Read and promptly respond to teacher communication
- Contact the teacher with questions
- Manage your time wisely

### Teacher

- Welcome Phone Call in the first two weeks
- 24 – 48-hour turnaround on all communication
- 24 – 48-hour turnaround on grading for items submitted by the due date
- Provide relevant feedback on assignments
- Be accessible via email and phone or text during published hours
- Provide two or more live sessions per term

## Remind

CVA students and parents are automatically enrolled in their CVA teacher's Remind class based on the phone numbers provided during registration. If a parent and student provide the same cell phone number, they will not sync to Remind and will have to join the class manually using the join code posted on the Teacher Information page of their course.

## Student Support

A student's first source for support is their CVA teacher. However, additional support is available. The **CVA Learning Center** is staffed with facilitators and is available both **in person** and **virtually**.

Facilitators can assist students with getting started, class navigation, assignment instructions, submitting work, technical issues, and strategies for online success.

The in-person Learning Center is on the Cobb Horizon High School campus at 1765 The Exchange Atlanta, GA.

All CVA students are enrolled in the Student Support digital classroom which provides access to the Virtual Learning Center (VLC). Students use the CTLS chat feature to send a message to the Student Support Team during the hours it is open.

## Live Sessions

Your teacher will post live session information to the Class Board.