

**FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT**

**Final Course Outline  
Algebra 1**

**Date:** March 2002

**Subject Area:** Mathematics

**Proposed Grade Level(s):** 9-12

**Course Length:** 1 Year

**Grading:** A-F

**Number of Credits:** 5/semester

**Prerequisite:** Completion of Course 2 with an 'A' or 'B', with teacher recommendation

**BRIEF COURSE DESCRIPTION:**

This is a traditional one-year Algebra 1 course. At the end of the course, students will have completed all of the state Algebra 1 standards. Student success and mastery of Algebra 1 is a primary factor in students' ability to succeed in advanced math courses such as Algebra 2. This course moves quickly and emphasizes the development of logic and skill within the framework of algebraic thought and methodology. Students who find themselves overly challenged by the speed and volume of course content are encouraged to explore the 2-year Algebra 1 program to see if it is a better fit for their learning style and needs.

Algebra 1 is also offered as an online course. Instruction in the online course takes place in both synchronous and asynchronous environments. Students attend real time virtual class meetings, view recorded lectures and communicate with their teacher and peers via email and discussion boards. The same coursework is required as in the traditional environment.

**GENERAL GOALS/PURPOSES:**

As stated in the mathematics framework, students in algebra learn to reason symbolically, and the complexity and types of equations and problems that they are then able to solve increase. Key content includes understanding, writing, solving, and graphing linear and quadratic equations. Students will also be able to compute monomial and polynomial expressions. In addition to focusing on the basic techniques of algebra, students will extend their mathematical reasoning in many ways including justifying steps of an algebraic procedure and checking algebraic arguments for validity.

In the online course, the explanations and visual displays necessary to communicate algebraic concepts translate well to the tools of the electronic whiteboard and demonstration software. Participation via virtual class meetings and discussion boards emphasizes the need to communicate concepts, questions and arguments clearly.

**STUDENT READING COMPONENT:**

Students will receive instruction on the effective use of their textbook. Algebra 1 includes many applications where effective reading and analysis are taught as part of the course. Also, projects will emphasize reading across the curriculum.

## **STUDENT WRITING/ORAL COMPONENT:**

Students will have opportunities to express in writing their understanding of concepts as well as orally presenting work to the class. All written work will follow standard rules of English. Any research projects will follow MLA format, which has been distributed at all secondary sites.

### **Final Assessment:**

District Algebra 1 Final sent to the school sites from Granite Center in June. It is also recommended, but not required, that each school site generate a common trimester 1 & 2 or semester 1 final for that site.

## **DETAILED UNITS OF INSTRUCTION:**

### **Connections to Algebra**

1. Variables in algebra
2. Exponents and powers
3. Order of operations
4. Equations and inequalities
5. Translating words into mathematical symbols/Introduction to problem solving
6. Tables and graphs
7. Introduction to functions

### **Properties of Real Numbers**

1. Real number line
2. Absolute value
3. Computations with real numbers
4. Distributive Property
5. Combining like terms

### **Solving Linear Equations**

1. Solving one-step and multi-step equations
2. Solving equations with variables on both sides
3. Formulas
4. Ratios and rates
5. Percents

### **Graphing Linear Equations and Functions**

1. The Coordinate Plane
2. Graphing horizontal and vertical lines
3. Graphing lines using intercepts
4. Slope
5. Graphing lines using slope intercept form
6. Direct variation
7. Functions and Relations

### **Writing Linear Equations**

1. Slope intercept form
2. Point-slope form
3. Writing linear equations given two points
4. Standard form
5. Modeling with linear equations
6. Perpendicular lines

### **Solving and Graphing Linear Inequalities**

1. Solving one-step and multi-step linear inequalities
2. Solving compound inequalities involving “and” and “or”
3. Solving absolute value equations and inequalities

4. Graphing linear inequalities in two variables

### **Systems of Linear Equations and Inequalities**

1. Graphing linear systems
2. Solving linear systems by substitution and linear combinations
3. Applications of linear systems
4. Having a physical interpretation of the number and type of solutions to a system of linear equations
5. Graph solutions to systems of linear inequalities

### **Exponents and Exponential Functions**

1. Properties of exponents
2. Zero and negative exponents
3. Graphs of exponential functions
4. Scientific notation
5. Exponential growth and decay functions (optional)

### **Quadratic Equations and Functions**

1. Definition of square root
2. Simplify radicals
3. Graph quadratic functions and be able to find solutions to the related equation
4. Solving quadratic equations using the quadratic formula
5. Understand the role of the discriminant and its connection to the graph of a quadratic function
6. Graphing quadratic inequalities

### **Polynomials and Factoring**

1. Adding, subtracting and multiplying polynomials
2. Special products
3. Solving quadratics in factored form
4. Develop a sequence of steps for factoring all trinomials and some polynomials which factor by grouping. Know how to factor binomials in the form  $a^3 + b^3$  and  $a^3 - b^3$ .

### **Rational Expressions and Equations**

1. Proportions
2. Direct and inverse variation (optional)
3. Simplifying rational expressions
4. Adding, subtracting, and multiplying rational equations
5. Dividing rational expressions (include long division of the polynomials)
6. Solving rational equations, be able to find undefined values

### **Radicals and More connections to Geometry**

1. Functions involving square roots
2. Operations with radical equations
3. Solving radical equations
4. Rational exponents
5. Completing the square, expose students to the proof of the quadratic formula
6. Pythagorean Theorem and its converse
7. Distance and midpoint formulas
8. Logical Reasoning: Proof (optional)

## **THIS COURSE WILL PREPARE STUDENTS FOR THE CAHSEE AND/OR FCUSD EXIT EXAMS**

Math

**LAB FEE, IF REQUIRED:** None

## **SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:**

See “Detailed Units of Instruction”.

## **DISTRICT ESLRs TO BE ADDRESSED:**

When students exit a secondary mathematics course, they will be:

- **Self-directed Learners** who will be able to use notes and a textbook to assist them in continuing their learning outside of the classroom setting.
- **Efficient Communicators** who can explain mathematical concepts to others and use mathematics to organize and explain data.
- **Quality Producers** who understand the importance of neat, organized work that demonstrates their thinking and understanding of the solution they’ve formed to solve a problem.
- **Constructive Thinkers** who are able to attack problems with organization, logic, and mathematical skills they’ve developed in a systematic fashion.
- **Collaborative Workers** who can work in a variety of settings in culturally diverse groups. They will be able to form and use study groups to strengthen their own understanding in addition to providing the same service for classmates.
- **Responsible Citizens** who accept the consequences of their actions and who demonstrate their understanding of their role in the learning process.