

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

ALGEBRA I with SUPPORT

DATE: March, 2008

SUBJECT AREA: Mathematics

COURSE TITLE: Algebra I with Support

COURSE LENGTH: 2 4x4 Terms

PROPOSED GRADE LEVEL(s): 9-12

NUMBER OF CREDITS: 20 (10 per term)

GRADING: A-F

PREREQUISITES: None

BRIEF COURSE DESCRIPTION:

This is a “two term” Algebra 1 course designed to help struggling math students succeed. 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 emphasizes the development of logic and skill within the framework of algebraic thought and methodology. In addition this, this course will offer tutorial support, basic Algebra Readiness skills review and development, activities that are designed to improve student preparedness for new algebra concepts, and increase student understanding and comfort level with key algebraic concepts.

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 polynomials 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.

Algebra Support will focus on three areas: 1) pre-teaching concepts so students are prepared for their Algebra lessons; 1) re-teaching/reviewing/enriching key concepts to improve understanding of algebraic standards; and 3) tutorial support designed to improve student performance in their Algebra 1 course. The support class will work in partnership with the Algebra 1 course to give students the organizational and study skills needed to succeed in the academic discipline of algebra.

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

DETAILED UNITS OF INSTRUCTION:

Algebra I Units

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)

Support Units (This units spiral throughout the entire year)

1. Whole number operations
2. Order of operations
3. Integers
4. Distributive property
5. Fractions
6. Decimals
7. Graphing

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

IN:

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.