Reseda High School Police Academy Magnet
Algebra 2 A/B

Instructor: Mr. Ethington

Course Description:
In Algebra 2 A/B, while integrating *law enforcement themes,* we will expand students' knowledge gained in Algebra 1 and Geometry, and prepare students with the skills they need to delve into higher math. We will also develop logical thought processes with emphasis on reasoning and logical arguments.

Topics of Instruction:

Unit 1: A solid foundation in Algebra
CA Content Standards: 1.0, 12.0, 24.0, 25.0
Arithmetic properties of rational numbers including the Associative, Commutative, and Distributive properties, as well as the closure properties of addition, subtraction, multiplication, and division
Rules of exponents and order of operations
Functions, functional notation, substitution, order of operations, and domain and range of functions
Operations on functions and composition of functions
Balancing equations single variable equations and inequalities
The Scales of Justice
Solving linear equations in one variable
Solving and graphing linear inequalities in one variable
Working with compound inequalities and absolute value

Unit 2: Reviewing and More about Lines
CA Content Standards: 2.0
The Cartesian plane and graphing solutions to multivariable equations
Linear equations and their forms
Graphing linear equations and x- and y-intercepts
Slope, parallel lines, and perpendicular lines
Graphing linear inequalities in two variables
Systems of linear equations
Solving systems of equations in 2 variables
Systems of equations word problems
Maximizing the deterrent effect of laws and law enforcement
Evaluating the efficacy of laws

Solving systems of equations in 3 of more variables

Unit 3: Polynomials and Rational expressions
CA Content Standards: 3.0, 4.0, 7.0, 8.0, 15.0,
Adding, subtracting, and multiplying polynomials
Factoring polynomials and solving polynomial equations
Key suspects method
Simplifying, adding, subtracting, multiplying, and dividing rational expressions
Solving equations with rational expressions
Simplifying complex rational expressions and solving complex rational equations

Unit 4: Complex numbers and the Quadratic Formula
CA Content Standards: 1.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10, 15.0,
Complex numbers and their graphs
Operations with and absolute value of complex numbers
Complex conjugates and rationalizing denominators of complex numbers
Completing the square to solve equations
Prove the Quadratic Formula by completing the square
Using the quadratic formula
Path of a bullet in flight
Using the discriminant to describe solution of quadratic equations
Graphing quadratic equations using $y = a(x-b)^2+ c$
Determining maxima, minima, and zeros of quadratic equations

Unit 5: Conic Sections
CA Content Standards: 3.0, 4.0, 8.0, 9.0, 16.0, 17.0,
Parabola equations
Circle equations
Ellipse Equations
Blood splatter patterns to find explain crime scenes
Hyperbola Equations
Completing the square to put equations in standard form

Unit 6: Exponential and logarithmic equations
CA Content Standards: 11.0, 11.1, 11.2, 12.0, 13.0, 14.0, 15.0,
Solving exponential equations using laws of exponents
Logarithms and transferring between logarithmic equations and exponential equations
Properties of logarithms
Change of base
Using logarithms to solve equations
Time of death by body temperature
Exponential decay to solve cold cases

Unit 7: Probability
CA Content Standards: 18.0, 19.0
Basic probability
Permutations and probability
Combinations and probability
Compound probability
Minimizing officer risk

Unit 8: Sequences and series
CA Content Standards: 3.0, 20.0, 21.0, 22.0, 23.0,
Sequences and computing general terms
Series and computing sums of finite series
Computing sums of infinite arithmetic and geometric series
Binomial theorem

Grading
Standard grade cutoffs are used, A: 90% and up, B: 80% to 89%, C: 70% to 79%, D:60% to 69%, F: 59% and below.

Attendance, Cooperation and Work Habits
You are required to follow the attendance policy of the school. Your attendance will have a direct connection to your semester grade. You will receive participation points that are determined on whether your are in class or not. If you are not in class you cannot participate. Attending class is very important, especially since the institution of block schedule. Absent students will miss opportunities to receive in class participation and classwork points, as well as missing out on instructional time, and each day of instruction with block schedule is equivalent to two traditional days of class. In order to be successful, you must attend class on a regular basis.

Exams must be made up the day you return to school. Missed quizzes will result in a zero with the following quiz counting double. Missing more than two quizzes in a semester will result in a written and oral report on the quiz subject matter for each missed quiz. Quiz make-ups must be turned in within one day of returning to school.

Cooperation and respect are expected at all times. Compliance with school and classroom rules is required. Deviation from behavior requirements will result in class suspension.

Assignment Types
Students will be graded by tests, quizzes, classwork, homework, projects, and participation as follows:

Tests -	50%	Classwork -	15%
Projects -	12%	Homework -	5%
Quizzes -	10%	Participation -	8%

Homework and Classwork Policy
All classwork and homework will be assigned during class, and is due the first day of the following week, at which time the teacher will select one assignment to collect and grade. To receive full credit for an assignment, the assignment must be complete, written neatly in pencil, with all steps shown, and most of the work correct. In the event that a student does not have the required assignment on the date due, they may receive up to 60% of the original grade by turning in all of the assignments issued during the previous week within ten school days of the original due date. Students who are absent on the date the work was collected may receive 100% of the original grade by turning in all of the assignments issued during the previous week within ten school days of the original due date. Students who are absent for any reason are expected to get all missed notes and assignments from the teacher or from other students.

All student work must be that of the individual student. CHEATING of any type will not be tolerated. This applies to ANY and ALL assignments. Any incidence of cheating will result in parent conferencing, a zero on the assignment (for all students(s) involved) and a "U" in both work habits and cooperation on the 5, 10, 15 and 20 week report cards.

Reseda High School ESLRS
In my class, students do much of their work in cooperative learning groups. I believe this type of activity helps students to learn from each other, and helps students achieve the Reseda High School ESLRS:
*Effective Communicators
*Critical Thinkers
*Self-Directed Learners
*Responsible Citizens
*Healthy Individuals

CA State Content Standards:

1.0 Students solve equations and inequalities involving absolute value.

2.0 Students solve systems of linear equations and inequalities (in two or three variables) by substitution, with graphs, or with matrices.

3.0 Students are adept at operations on polynomials, including long division.

4.0 Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.

5.0 Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.

6.0 Students add, subtract, multiply, and divide complex numbers.

7.0 Students add, subtract, multiply, divide, reduce, and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions, including those with negative exponents in the denominator.

8.0 Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.

9.0 Students demonstrate and explain the effect that changing a coefficient has on the graph of quadratic functions; that is, students can determine how the graph of a parabola changes as a, b, and c vary in the equation .

10.0 Students graph quadratic functions and determine the maxima, minima, and zeros of the function.

11.0 Students prove simple laws of logarithms.

11.1 Students understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

11.2 Students judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.

12.0 Students know the laws of fractional exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.

13.0 Students use the definition of logarithms to translate between logarithms in any base.

14.0 Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values.

15.0 Students determine whether a specific algebraic statement involving rational expressions, radical expressions, or logarithmic or exponential functions is sometimes true, always true, or never true.

16.0 Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.

17.0 Given a quadratic equation of the form ax2 + by2 + cx + dy + e = 0, students can use the method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.

18.0 Students use fundamental counting principles to compute combinations and permutations.

19.0 Students use combinations and permutations to compute probabilities.

20.0 Students know the binomial theorem and use it to expand binomial expressions that are raised to positive integer powers.

21.0 Students apply the method of mathematical induction to prove general statements about the positive integers.

22.0 Students find the general term and the sums of arithmetic series and of both finite and infinite geometric series.

23.0 Students derive the summation formulas for arithmetic series and for both finite and infinite geometric series.

24.0 Students solve problems involving functional concepts, such as composition, defining the inverse function and performing arithmetic operations on functions.

25.0 Students use properties from number systems to justify steps in combining and simplifying functions.