Saint Mary's College High School
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Algebra 3-4 HP
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Course Description:

This is an accelerated mathematics course that combines a second or advanced course in algebra with an extended introduction to trigonometry. Topics include: linear equations in one and two variables, functions, systems of equations, polynomials and rational expressions, quadratic equations in one and two variables, logarithms, conic sections and trigonometric functions and identities.

Syllabus:

The course will follow the outline of the text:

First Semester:

Solving Equations and Inequalities
Linear Relations and Functions
System of Equations and Inequalities
Polynomials
Quadratic Functions

Second Semester:

Polynomial Functions
Conic Sections
Multiplying and Dividing Rational Expressions
Logarithms
Trigonometric Functions, Graphs and Identities

Big Ideas:

- What is the real number system?
- What are the primary subsets of the real number system?
- What would happen if we didn't have the order of operations?
- What is a solution to an algebraic equation?
- What is a function?
- How does a function behave?
- What is the composition of functions?
- What is the inverse of a function?
- What is a linear equation?
- How does a graph represent the truth set for the equation and inequality?
- What s a system of equations?

- How does the slope represent rate of change
- How do polynomials and exponential functions model real world behavior?
- What is the essential structure and behavior of polynomials?
- How do radical expressions relate to exponents?
- If a parabola does not cross the x-axis, does it have a solution?
- What are the roots of a quadratic equation found when looking at its graph?
- If a quadratic expression, never equal to zero, can it be factored?
- How does the lead coefficient affect the graph of a polynomial function?
- How are conic sections formed?
- What are the relationships between conic sections?
- How does a graph represent the truth set of a rational expression?
- What is the relationship between logarithms and exponents?
- How do trig function definitions follow from reference triangles for angles in standard position?
- How is trigonometry rooted in the Pythagorean theorem?
- Why is it necessary to have radian measure?
- How is an identity different from an equation?
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Core Tasks:

Students should be able to…

* Use the order of operations
* Classify real numbers
* Solve and evaluate equations]
* Solve inequalities
* Relate equations to functions and relations
* Relate functions to graphs
* Find the slope and y-intercepts of linear equations
* Rewrite linear equations in standard and slope-intercept forms
* Graph parallel and perpendicular lines
* Solve a system of equations
* Classify system of equations
* Apply the rules of polynomials
* Simplify polynomials
* Factor polynomials using the various rules of factoring
* Simplify radical and rational expressions
* Solve rational and radical expressions
* Define a complex number "i"
* Apply the rules to complex numbers
* Demonstrate knowledge of the pieces of a parabola
* Solve quadratic equations by: factoring, graphing, completing the square formula.

* Use the discriminant to determine the type of roots of quadratic equation
* Evaluate polynomial functions
* Graph and analyze the parts of a polynomial function
* Find the solutions/roots of a polynomial function
* Simplify polynomial functions using composition of functions
* Find the inverse of a function
* Determine what is a conic section
* Rewrite conic sections in standard form
* Graph conic sections
* Find the pieces of each conic section
* Simplify rational expressions
* Graph rational expressions
* Rewrite an exponential equation into a logarithmic equation
* Use the properties of logarithms to solve and simplify
* Use SOHCAHTOA to solve a right triangle
* Convert radians to degrees and degrees to radians
* Define exact values
* Apply the Law of Sines and Cosines to solve a non-right triangle
* Use identities to find trig values
* Simplify trig identities
* Verify trig identities
* Solve for sine and cosine using the sum and difference formulas and double angle formulas

Required Materials:

All students are required to bring to class every day the following materials:

1. Text: **Algebra 2** (Glencoe, McGraw Hill: Publishers)
2. Spiral notebooks for notes and homework
3. A binder to hold all returned papers
4. Pencils
5. Paper
6. Graphing Calculator (Ex: TI-83 or higher)

None of the above is an option!!! Failure to come prepared to class will result in participation points being lowered, and possible dismissal from the class. You may not go to your locker to acquire the needed materials for class. If you lose your text or your calculator, you must purchase another immediately. All of the above materials are needed everyday, so if you fail to have them, you will not be able to participate in class. Participation is vital to your success in this class.

The above materials must be present in class beginning Wednesday, August 20th

Evaluation of Work:

The semester grade will consist of the following categories:

Chapter Exams	40%
Quizzes	25%
Homework	20%
Final	15%

Chapter Exams:

Exams are given at the end of every chapter. Each exam is worth 100 points. If you miss an exam due to an absence, a make-up exam will be scheduled with you upon your return to school. Please be prepared to take the exam within one to two days upon your return.

Quizzes:

There will be quizzes given about once a week. If you are absent from school on a day of a quiz, please be prepared to make-up the quiz on the day you return to school.

Homework:

Homework will be given on a daily basis, including weekends!!! I do not accept any late homework except when a student has an excused absence. Each homework is worth 10 points. You must show work to receive full credit.

Grading Scale

100%	A+
99-94%	A
93-90%	A-
89-87%	B+
86-84%	B
83-80%	B-
79-77%	C+
76-74%	C
73-70%	C-
69-67%	D+
66-64%	D
63-60%	D-
59-0%	F