

## **Algebra 2 with Trigonometry**

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**Office hours: By appointment. I am available after school on most days.**

**Course Description:** This class is a college prep level overview of various algebra 2 content areas. It is intended to prepare students for upper level high school and college mathematics, including precalculus and AP statistics.

We will cover the following chapters for the first semester:

- Ch. 1 Equations and Inequalities
- Ch. 2 Linear Equations and Functions
- Ch. 3 Systems of Linear Equations and Matrices
- Ch. 4 Quadratic Functions and Factoring
- Ch. 5 Polynomials and Polynomial Functions

The second semester will cover the following chapters:

- Ch. 6 Rational Exponents and Radical Functions
- Ch. 7 Exponential and Logarithmic Functions
- Ch. 8 Rational Functions
- Ch. 13 Trigonometry
- Ch. 12 Sequences and Series
- Ch. 10 Counting Methods and Probability

**Textbook & Required Material:** The book for this class is Holt McDougal Larson Algebra II (Larson, Boswell, Kanold, Stiff). You will also need graph paper and your TI-83 or TI-84 calculator. Please bring your calculator and graph paper to class every day, even if we haven't used them for a while.

## Course Goals & Benchmarks:

Students completing course work in Algebra 2 will:

- Solve equations involving absolute value.
- Solve systems of linear equations and inequalities (in two or three variables) by substitution, elimination, with graphs and with matrices.
- Complete operations on polynomials, including addition, subtraction, and multiplication.
- Factor polynomials representing the difference of two squares, greatest common factors, perfect square trinomials, trial and error trinomials, and the sum and difference of two cubes.
- Add, subtract, multiply and graph complex numbers.
- Add, subtract, multiply, divide, reduce and evaluate rational expressions with monomial and polynomial denominators, and simplify complicated rational expressions including complex fractions and expressions with rational exponents.
- Solve and graph quadratic equations by factoring, completing the square, and using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.
- Determine how the graph of a parabola changes as  $a$ ,  $b$ , and  $c$  vary in the equations  $y=a(x-b)^2+c$ .
- Graph quadratic functions and determine the maxima, minima, and zeros of the function.
- Apply simple laws of logarithms including the properties and inverse relationships to solve problems.
- Write exponential functions to model growth and decay situations, graph the functions.
- Solve exponential and logarithmic equations.
- Use properties of logarithms to simplify logarithmic expressions and identify approximate values.
- Use Fundamental Counting Principle to compute combinations and permutations.
- Use combinations and permutations to compute probabilities.
- Find the general term and the sums of arithmetic series and of both finite and infinite geometric series.
- Solve problems involving functional concepts such as composition, defining the inverse function and performing arithmetic operations on functions.
- Use real number properties to justify algebraic steps.
- Use matrix algebra to solve equations and to solve systems of equations represented by matrices.
- Understand, measure, and sketch angles in standard position.
- Know the definitions of the basic trigonometric functions.
- Use trigonometry to determine unknown sides or angles in right triangles.
- Write and solve rational equations (work, rate, and flow problems).

**Grading policy:** Your grade for the class will be (approximately) 40% chapter tests, 25% final, 20% quizzes, and 15% homework. The grading scale is the standard 90-80-70-60 scale. Homework will be assigned on a regular basis, and will generally be collected on the day of a quiz/test. Homework should be organized, legible, and should demonstrate that some time and effort was put into it. If you are absent on the day that homework is collected, it is your responsibility to turn it in on the day that you return. Late homework will not be accepted.

We will have a quiz and a test over every chapter and a final at the end of the semester. Ordinarily, if you miss a quiz or a test due to absence, you will make it up on the day that you return (I strongly prefer that tests and quizzes NOT be made up during class time, so if you miss a test or quiz, plan on coming in early or staying after school to take it the next day). However, if you are absent for several days, we can make arrangements when you get back. If you know in advance that you will be absent on the day of a quiz or a test, talk to me and we will try to work something out.

**General Classroom Expectations:** The school policy on absences and tardies can be found in the student handbook. If you are absent from class, it is your responsibility to get the notes and any homework assignments from that day. When you are absent, please check the website for any homework assignments and upcoming quizzes/tests. When in class, you will conduct yourself with the honor and dignity that is expected of an Immaculate Heart student. This means that, among other things, you will pay attention, not create distractions for yourself or others, and always adhere to the academic integrity code of this school.