Mathematics

Geometry

This course will introduce you to axiomatic (Euclidean) geometry, transformations, proofs, and properties of two to three-dimensional figures. A major emphasis will be placed on developing your ability to explore and solve real-world application problems, appropriately use technology, and communicate mathematical ideas clearly. This class is meant to challenge you and prepare you for subsequent courses in mathematics while providing you with the necessary tools to become a successful individual.

Algebra II

Algebra comes from the Arabic words "al-jabr", meaning "putting broken parts back together." In this class, we will be studying the way that equations are formed, their significance, and various properties of theses kinds of functions.

Unit 1: Quadratic Functions
In this unit, we will be studying properties of quadratic functions, functions involving terms as high as x^2. We will study the various different forms of writing down quadratic equations, the real-world significance of these kinds of functions, as well as techniques for solving quadratic equations.

Unit 2: Other Polynomial Functions
Using the information learned from unit 1, we will move on to study functions with higher powers of x, including x^3, x^4, etc. While these kinds of functions are significantly more complicated than quadratic functions, we will examine what kinds of general properties all polynomial functions possess. We will also study ways of finding solutions to polynomial equations such as polynomial division.

Unit 3: Sequences and Series
Moving from functions, we will study the properties of sequences and series: the way that rules can govern how lists of numbers change. We will first study arithmetic sequences where each number increases by the same amount. Then we will study geometric sequences, where each number in the list multiplied by a constant factor instead of adding. Finally, we'll examine some properties of recursive functions, and studying why they are useful.

Throughout the course, there will be a focus on Algebra as more than just a way of studying equations, and more as a way of thinking and solving any kind of problem. As the world is evolving, and technology makes doing mathematical computations simpler and simpler, we will consider these three **essential questions**:

1. In what ways was Algebra useful before the invention of calculators and other technology?
2. What does Algebra teach us about subjects and challenges other than math?
3. Is math actually all around us, or is that just something our math teachers tell us?

Pre-Calculus / Trigonometry

Trigonometry comes from the Greek words trigonon (meaning triangle) and metron (meaning measure). It is the study of how the sides of triangles are related to each other. In this course, we will study the properties of the trigonometric functions (sin, cos, and tan) as well the significance of these topics in the real world.

Unit 1: Trigonometry in Triangles
This unit focuses on the relationships betweens sides of a triangle, including how to determine the angles in a right triangle based on the lengths of the sides, or how to find the lengths of a triangle based on the angles involved. We will examine properties of vectors in an effort to connect these topics to the real world.

Unit 2: Trigonometric Functions and Graphs
This unit focuses on the wave-like properties of sin and cos graphs, studying properties like periodicity and amplitudes. We will work on sketching graphs based on equations, as well as determining equations based on graphs. This unit will also focus on solving trigonometric equations.

Unit 3: Regents Review
In preparation for the January Algebra II Common Core regents, we will review topics from Algebra II, as well as study the kinds of questions that the Regents exam is likely to ask.

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SAT – Math

SAT Math is designed to expose students to the form and content of the math portion of the standardized test that high school students take when applying to college. The objective of the course is to provide students with a preview the exam, review the skills required to interpret

and answer test questions, explore practice questions and answers, as well as to teach test-taking techniques and strategies to maximize scoring potential.

The course's content can be broken down into three main units:

(1) The Heart of Algebra – This unit focuses on linear equations, their graphs and their applications,

(2) Problem Solving and Data Analysis – This unit focuses on real-world problems that involve concepts like proportions, units and statistical analysis, and

(3) Additional Topics In Math – This unit covers a variety of concepts, including geometry, trigonometry and complex numbers