

# MATHEMATICS

(four credits required)

The mathematics curriculum is a structured sequence beginning with Algebra I and proceeding through Geometry and Algebra II. To complete a minimum of 4 credits, courses may be taken in Trigonometry, Calculus, Transitioning to College Mathematics, or Probability and Statistics. State law requires that students be enrolled in a mathematics class every year they are in high school.

## Algebra I

This course will develop the ability to translate verbal expressions into mathematical symbols. Order of operations, solving equations and inequalities, and factoring will be applied to these mathematical symbols. Linear equations will also be studied through graphing, writing equations, and real-life applications.

## Geometry

This course contains the traditional topics of plane and solid geometry with an emphasis on inductive/deductive thinking and problem solving. Properties, congruency and similarities in triangles and other polygons will be studied. *Prerequisite: Meeting a minimum benchmark score on the HSPT or successful completion of Algebra I.*

## Honors Geometry

This course contains the traditional topics of plane and solid geometry and investigates areas of non-Euclidian geometry. Properties, congruency and similarities in triangles and other polygons will be proven and studied. The topics are covered in more depth at a much faster pace and students are expected to work independently and through digital means. Emphasis is placed on critical thinking, reasoning, and proof to solve complex problems. Connections are made with other areas of mathematics through problem solving. *Prerequisite: Successful completion of Algebra I and teacher recommendation or recommendation based on Placement Exam scores*

## Algebra II

The operations of Algebra I are reviewed and strengthened. Additional content includes the solution of equations and inequalities in one, two, and three variables, the graphs of relations, complex numbers, quadratics, and higher degree polynomial functions, logarithms, and exponential functions. *Prerequisite: Successful completion of a Geometry course*

## Honors Algebra II

The objective of this class is to develop proficient math thinkers while covering the topics of solving equations in one, two, and three variables, the graphs of functions, complex numbers, the properties of quadratics and higher degree polynomials, logarithms, and exponential functions. The use of multiple strategies will be stressed. The topics are covered in more depth at a much faster pace and students are expected to work independently and through digital means. Emphasis is placed on critical thinking, reasoning, and proof to solve complex problems. *Prerequisite: Successful completion of a Geometry course and teacher recommendation or recommendation based on Placement Exam scores*

## Topics in Mathematics

This course will include the learning outcomes students need to know to be considered college ready in mathematics. It will prepare students for the transition to college mathematics and for real world applications of mathematics. *Prerequisite: This course is for seniors only. Teacher recommendation required. Preference will be given to those students not meeting the math ACT benchmark scores*

## Trigonometry and Precalculus

This course will study the six trigonometric functions and their inverses, vectors, parametric equations, and polar equations from an algebraic, geometric, and graphical standpoint. Also included will be a study of conic sections. *Prerequisite: Successful completion of an Algebra II class and teacher recommendation*

## Honors Trigonometry and Precalculus

This course will cover all the topics of Trigonometry and Precalculus plus additional trig identities and graphing techniques. Real life applications will be stressed. *Prerequisite: Successful completion of an Algebra II class and teacher recommendation*

## Probability and Statistics

This is a one-year course on the study of elementary statistics and probability. One- and two-variable statistics will be analyzed using data collected by the students. Using visual and numerical representations to describe data sets and to study the likelihood of well-defined event, including using the principles of counting, will be emphasized first semester. The focus for the second semester is using sample data to draw conclusions about larger groups, and to analyze the likelihood of those events. *Prerequisite: Successful completion of an Algebra II class*

## Calculus

This course is an introduction to Calculus, covering topics in differentiation and integration while reviewing necessary algebra and trigonometry skills. Content concentrates on real world applications, including related rates, rather than proof of the above topics. *Prerequisite: Successful completion of a Trigonometry/Precalculus class and teacher recommendation*

## Honors Calculus

This course is a study in elementary functions and the calculus of a single variable including limits, differentiation, and integration. *Prerequisite: Successful completion of a Trigonometry/Precalculus class and teacher recommendation*

## Honors Calculus II

This class is a continuation of the Calculus topics learned in Honors Calculus. Such topics include applications of differential and integral Calculus of logarithmic, exponential, and inverse trigonometric functions, further study of integration of all functions, and applications relating to real world values. As time permits, the Calculus of parametrically defined functions, polar functions, and infinite series will be introduced.

*Prerequisite: Successful completion of Calculus or Honors Calculus and teacher recommendation*

## Advanced Placement Calculus AB

This course is an intense study in the calculus of functions of a single variable. Theory and applications of limits, differentiation, and integration are discussed. In May, the students will take the College Board's Advanced Placement Calculus AB exam.

*Prerequisite: Successful completion of a Trigonometry/Precalculus class and teacher recommendation*

## Advanced Placement Calculus BC

This course is a continuation of the calculus learned in AP Calculus AB. Content includes integration methods and applications, the calculus of parametric, polar, and vector functions, infinite series, Euler's method, and L'hospital's Rule. In May the students will take the College Board's Advanced Placement Calculus BC exam.

*Prerequisite: Successful completion of AP Calculus AB and teacher recommendation*

## Advanced Placement Statistics

This class introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Four broad themes are covered: exploring data (describing patterns and departures from patterns); sampling and experimentation (planning and conducting a study); anticipating patterns (exploring random phenomena using probability and simulation); and statistical inference (estimating population parameters and testing hypotheses).

*Prerequisite: Successful completion of an Algebra II class and teacher recommendation*