

Monte Vista High School requires students to earn three credits of mathematics for graduation. Students planning to pursue a college education should adhere to the following math sequence:

Algebra I
Geometry
Algebra II
Pre-Calculus
Advanced Placement Calculus

ALGEBRA I

CREDIT: 1
LENGTH: One year
LEVEL: Grades 9
PREREQUISITE: None

This course deepens and extends the student's understanding of linear, quadratic, and exponential relationships. Students analyze and explain the process of solving linear and quadratic equations and inequalities. Students learn function notation and develop the concepts of domain and range. They interpret functions graphically, numerically, symbolically, and verbally, translate between representations, and understand the limitations of various representations. Students compare and contrast linear and quadratic functions and explore systems of equations and inequalities. They analyze polynomials and develop the factoring process. Students compare the key characteristics of quadratic functions to those of linear and exponential functions. Students also expand their experience with functions to include more specialized functions - absolute value, step, and those that are piecewise-defined. An Algebra I credit is required for high school graduation and for college entry.

HONORS ALGEBRA I

CREDIT: 1
LENGTH: One year
LEVEL: Grades 9
PREREQUISITE: Teacher recommendation

This course is designed for advanced students who intend to complete Pre-Calculus in high school. This course covers all of the topics of Algebra I with a more in-depth approach to problem solving. Additional content and rigor demand a faster pace for instruction and learning. Appropriate technology is integrated into the curriculum. An Algebra I credit is required for high school graduation and for college entry.

GEOMETRY

CREDIT: 1
LENGTH: One year
LEVEL: Grades 9 - 12
PREREQUISITE: Algebra I

In this course students explore more complex geometric situations and deepen their explanations of geometric relationships through the development of inductive and deductive reasoning skills. Students identify, construct, and analyze line and angle relationships. Students establish triangle congruence criteria based on analyses of rigid motions and formal constructions. They use line and angle relationships along with triangle congruence as a familiar foundation for the development of formal proof. Students build a formal understanding of triangles, use similarity to solve problems, and apply similarity in right triangles to understand right triangle trigonometry, with particular attention to special right triangles and the Pythagorean Theorem. Students investigate two-dimensional and three-dimensional objects to create informal explanations of circumference, area and volume formulas. Students use a rectangular coordinate

system to verify geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines. Students prove basic theorems about circles, such as a tangent line is perpendicular to a radius, the inscribed angle theorem, and theorems about chords, secants, and tangents dealing with segment lengths and angle measures. A Geometry credit is required for high school graduation.

HONORS GEOMETRY

CREDIT: 1

LENGTH: One year

LEVEL: Grades 9 - 10

PREREQUISITE: Teacher recommendation

This course is designed for advanced students who intend to complete Pre-Calculus or Calculus in High School. This course covers all of the topics of Geometry with a more in-depth approach to problem solving. Additional content and rigor demand a faster pace for instruction and learning. Appropriate technology is integrated into the curriculum. A Geometry credit is required for high school graduation.

INTERMEDIATE ALGEBRA

CREDIT: 1

LENGTH: One year

LEVEL: Grades 10 - 12

PREREQUISITE: Algebra I

This course offers students the opportunity to reinforce and enhance their algebra skills to further prepare them for Algebra II and College Algebra. Students investigate functional relationships and use algebraic concepts and methods as a means of representation and as a tool for logical reasoning and problem solving. Students master the basic properties of linear equations and inequalities, systems of equations, polynomials, factoring and quadratic equations using a hands-on approach (using manipulatives and physical modeling to understand Algebra). Students extend their knowledge of number concepts to include irrational and complex numbers and their application to real-world situations.

ALGEBRA II

CREDIT: 1

LENGTH: One year

LEVEL: Grades 10 - 12

PREREQUISITE: Geometry (or concurrent enrollment in Geometry)

This course is recommended for any student who wants or will need a broad algebra base for his/her vocation. Students extend their repertoire of functions to include polynomial, rational, and radical functions. Students develop the structural similarities between the system of polynomials and the system of integers. They connect multiplication of polynomials with multiplication of multi-digit integers and division of polynomials with long division of integers. Students identify zeros of polynomials, including complex zeros of quadratic polynomials. Students expand their previous algebra work with functions, their geometric work with trigonometric ratios and circles, and how to use the coordinate plane to extend trigonometry to model periodic phenomena. Students extend their work with exponential functions to include solving exponential equations with logarithms. They identify appropriate types of functions to model a situation, they adjust parameters to improve the model, and they compare models by analyzing appropriateness of fit and making judgments about the domain over which a model is a good fit. Additionally, students identify different ways of collecting data including sample surveys, experiments, and simulations - and the role that randomness and careful design play in the conclusions that can be

drawn.

HONORS ALGEBRA II

CREDIT: 1

LENGTH: One year

LEVEL: Grades 10 - 12

PREREQUISITE: Teacher recommendation

This course is designed for advanced students who intend to complete Pre-Calculus or Calculus in High School. This course covers all of the topics of Algebra II with a more in-depth approach to problem solving. Additional content and rigor demand a faster pace for instruction and learning. Appropriate technology is integrated into the curriculum.

PRE-CALCULUS

CREDIT: 1

LENGTH: One year

LEVEL: Grades 11 - 12

PREREQUISITE: Algebra II

This course is recommended for any student planning on attending college. Specific topics in this course include a comprehensive review of Algebra II concepts, all of the trigonometric topics, polar coordinates and vectors. Advanced algebra topics of exponential functions, logarithms, and sequences and series are also taught. Skills and problem solving involving realistic applications are stressed. Appropriate technology, including graphing utilities, is integrated into the curriculum.

CALCULUS AB - AP

CREDIT: 1

LENGTH: One year

LEVEL: Grade 11 - 12

PREREQUISITE: Pre-Calculus

This course is designed to be a culmination of a high school math program. This is a full year course intended for college-bound students who have a thorough knowledge of college preparatory mathematics, including algebra, geometry, trigonometry, and analytic geometry (rectangular and polar coordinates, equations and graphs, lines, and conics). Calculus AB is a course in introductory calculus with elementary functions and is comparable to the first calculus course in colleges and universities. Topics include elementary functions (algebraic, trigonometric, exponential and logarithmic), differential calculus, and integral calculus. Appropriate use of technology is an integral part of the course. It is expected that students who take AP Calculus AB will seek college credit for the first calculus course and/or placement from institutions of higher learning.

Because passing the AP exam may qualify the student to by-pass a first-year college calculus course, AP Calculus should not be considered "college-prep." Rather, this is a college class, with college-level expectations for behavior, participation, and effort.