

# Mathematics

## Algebra I

Algebra I is a one-year course that builds on arithmetic skills and algebraic concepts taught in previous courses. Focus areas include four critical areas: (1) deepen and extend understanding of linear and exponential relationships; (2) contrast linear and exponential relationships with each other and engage in methods for analyzing, solving, and using quadratic functions; (3) extend the laws of exponents to square and cube roots; and (4) apply linear models to data that exhibit a linear trend. Meets UC and CSU requirements

## Geometry

Geometry is a one-year course that reviews and builds upon the geometric concepts of previous math courses. It emphasizes big ideas in an integrated algebra/geometry context. Key concepts included in the course are as follows: transformations and symmetry, relationships between figures, properties of plane figures, investigation and proof, geometric construction, and probability. The course encourages and guides the student in the discovery of new geometric concepts, and stresses the ability to reason logically and think critically. Meets UC and CSU requirements

## Honors/Integrated Math III (This course will transition to Algebra II, 2019-2020)

Integrated Math 3 focuses on Algebra, Geometry, Statistics and trigonometry. Algebra concepts covered include structure in expressions, arithmetic operations with polynomial and rational expressions, creating equations, reasoning with equations and inequalities, interpreting and building functions, and modeling with linear, quadratic, and exponential functions. Geometry concepts covered include modeling, measurement and dimension, similarity and right triangle properties. Statistics concepts covered include using, representing, and interpreting probability as well as categorical and quantitative data to make decisions. Trigonometry from both algebraic and geometric standards are also covered in the honors course. In this course, students will focus on the structure of expressions, writing expressions to solve problems, performing arithmetic operations on polynomials, understanding the relationship between zeroes and factors of polynomial expressions, using identities to solve problems and rewriting rational expressions. In addition to comparing linear, quadratic, and exponential models introduced in Integrated Math I and II students will construct models of these functions to solve problems. Geometry is explored through right triangle trigonometry and describing conic sections both geometrically and as an equation. Statistically, summary, representation, and interpretation of data on a single count or variable is explored to understand and evaluate random processes underlying statistical experiments. Inferences are then made from sample surveys, experiments, and observational studies. The honors course also addresses prerequisite skills and standards for Advanced Placement study in statistics or calculus. Meets UC and CSU requirements.

## Trig/Precalculus

This course is to prepare the student for AP Calculus AB utilizing function graphing technology. This course is a college level course which introduces functions and function algebra for majors in science, technology, engineering, and mathematics. The main focus is on linear, absolute value, polynomial, radical, rational, logarithmic and exponential functions. Students will learn algebraic techniques, modeling techniques and technology-based techniques for solving equations involving these functions and for investigating the graphs of these functions. The content includes trigonometric functions of real numbers and angles, analytic trigonometry and applications, polar coordinates, parametric equations, and introduction to vectors. Meets UC and CSU requirements.

#### AP Calculus AB (HONORS DESIGNATION)

The AP Calculus course is offered for the advanced math student. The course includes the study of elementary functions, limits, derivatives, applications of derivatives, anti-derivatives, integration and the application of the integral. A graphing calculator is required for this course. Meets UC and CSU requirements.

#### AP Calculus BC (HONORS DESIGNATION)

The two goals of this course are to give students a strong background in Calculus that is necessary for math, science, and engineering majors, and to prepare students to score highly on the AP exam in the spring. Students are expected to work with functions given by an equation, graph, table, or a description of its properties. Students are expected to know the graphs and properties of elementary functions. They are expected to be able to use these properties to find points of intersection, areas, and volumes of solids of revolution. Students will be able to use the graph of any function in conjunction with their knowledge of Calculus to predict and explain observed local and global behavior. Students will be able to evaluate limits, differentiate, and integrate elementary functions, as well as use methods such as L'Hospital's rule, U-Substitution, and integration by parts to perform these tasks for certain more complex functions. Meets UC and CSU requirements.

#### AP Statistics (HONORS DESIGNATION)

The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: 1) Exploring Data: Describing patterns and departures from patterns; 2) Sampling and Experimentation: Planning and conducting a study; 3) Anticipating Patterns: Exploring random phenomena using probability and simulation; 4) Statistical Inference: Estimating population parameters and testing hypotheses. Students who successfully complete the course and examination may receive credit and/or advanced placement for a one-semester introductory college statistics course. Meets UC and CSU requirements.