

All Math courses are focus on both content and how students interact with this content (Standards for Mathematical Practice).

### **Common Core Algebra 1**

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the middle grades. Because it is built on the middle grades standards, this is a more ambitious version of Algebra I than has generally been offered. Students deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. By the end of this course students should become fluent in the following:

- Solving characteristic problems involving the analytic geometry of lines, including, writing the equation of a line given a point and a slope.
- Adding, subtracting and multiplying polynomials.
- Transforming expressions and chunking (seeing the parts of an expression as a single object) as used in factoring, completing the square, and other algebraic calculations.

### **Common Core Geometry**

The fundamental purpose of the course in Geometry is to formalize and extend students' geometric experiences from the middle grades. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school CCSS. By the end of this course students should become fluent in the following:

- Triangle congruence and similarity criteria.
- Using coordinates to establish geometric results.
- Calculating length and angle measures.
- Using geometric representations as a modeling tool.
- Using construction tools, physical and computational to draft models of geometric phenomenon.

### **Common Core Algebra 2**

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. By the end of this course students should become fluent in the following:

- Divide polynomials with remainder by inspection in simple cases.
- See structure in expressions and use this structure to rewrite expressions (e.g., factoring, grouping).
- Translate between recursive definitions and closed forms for problems involving sequences and series.

### **Common Core Pre-Calculus**

Extending their understanding of complex numbers to points in the complex plane, students come to understand that multiplying a given set of points by a complex number amounts to rotating and dilating those points in the complex plane about zero. Matrices are studied as tools for performing rotations and reflections of the coordinate plane, as well as for solving systems of linear equations. Inverse functions are explored as students study the relationship between exponential and logarithmic functions and restrict the domain of the trigonometric functions to allow for their inverses. The year concludes with a capstone module on modeling with probability and statistics. \