

FCPS - Big Rocks for High School Mathematics

This document is a list of “big ideas” that are essential to mastery of course content and is not to be interpreted as a complete list of all topics to be taught. Content vocabulary should be an emphasis at ALL grades. In addition, the Math Practice Standards should be embedded throughout.

Algebra 1:

- 1) Solve multi-step equations and inequalities in one variable and represent the solution on a number line.
- 2) Write and graph linear equations in two variables that model real world situations.
- 3) Solve systems of equations by multiple methods and interpret their solutions in real world context.
- 4) Use function notation to perform arithmetic operations; find the domain and range of functions.
- 5) Perform arithmetic operations on polynomials.
- 6) Use rational and irrational numbers in the appropriate context of a problem.
- 7) Factor quadratic functions; Solve and graph quadratic equations using multiple methods.
- 8) Summarize, represent and interpret one or two variable data.

Geometry:

- 1) Use logic and proof to reason mathematically; make conjectures about, points, lines, angles, planes, polygons and other geometric figures.
- 2) Use various methods to prove figures are congruent or similar.
- 3) Classify polygons by their properties and use those properties to solve problems (parallel, perpendicular, angle relationships, triangles, etc.).
- 4) Use coordinate geometry (midpoint, distance, circles, parabolas) to analyze figures and solve problems.
- 5) Use properties of circles to solve problems involving chords, secants, tangents, inscribed angle, arcs, etc.
- 6) Introduce basic concepts of trigonometry including Pythagorean Theorem, sine, cosine, tangent, 45-45-90 and 30-60-90 triangles and use trig ratios to solve real world problems.
- 7) Use surface area and volume to analyze three dimensional figures including cross sections and ratios of perimeter, area and volume.

Algebra 2:

- 1) Solve multistep linear equations and compound inequalities involving absolute value and graph the solution on a number line, when applicable.
- 2) Solve systems of equations and inequalities using multiple methods as appropriate.
- 3) Solve and graph quadratic equations using real and complex numbers; use the discriminant to determine the number and types of solutions; find domain and range.
- 4) Identify and graph conic sections.
- 5) Factor, solve, and graph polynomial equations. Determine the number and type of zeros for a polynomial; use maximums, minimums, zeros, intercepts to graph a polynomial; find domain range.
- 6) Use operations on radical expressions and solve equations. Include rational and negative exponents, nth roots and rationalizing denominators.
- 7) Use logarithms to simplify expressions and solve equations.
- 8) Perform operations on rational expressions and solve rational equations.
- 9) Expand knowledge of trigonometry to include all six trig functions, the unit circle, radian measure, Law of Sines and Law of Cosines, graphs of trigonometric functions including amplitude and period.
- 10) Use counting principle to find the number of ways an event can happen and find the probability of that event.
- 11) Find the nth term in an arithmetic or geometric sequence and find the sum of a series.