

Summary of Algebra 2 Topics

The list of topics below is a summary of the topics included in the 2012 BVSD Algebra 2 Curriculum Essentials Document which incorporates the 2010 Colorado Academic Standards and the 2009 National Common Core Appendix A recommendations for high school courses.

The highlighted questions are those created by a group of Algebra 2 teachers who reviewed the standards. As these are unclear in the state standards, the responses in red provide clarity and definition to how these topics should be addressed in the Algebra 2 course in BVSD.

Algebra II Topics

Functions

- Operations on functions
- Inverses (Are we finding this graphical only? or Algebraically finding inverse of equations as well?)

Finding the inverse equation for linear and simple quadratic functions should be done algebraically and for all functions, finding inverses using table and graphs.

- Graphs and transformations of special functions (piecewise, step, abs. val, whole library of functions)
- Average Rate of Change, connecting tables, equations and graphs

Systems and Inequalities

- Solve inequalities in one variable.
- Review of graphing systems (linear and non-linear) and recognizing the solutions
- Applications of linear systems
- Linear Programming

Quadratics (assuming a knowledge of solution methods including completing the square?)

Factoring, completing the square and formula methods (difference of squares, cubes, etc) are introduced and mastered in M25 and Algebra 1.

- Introduce imaginary numbers, and operations
- Solving quadratics with complex answers
- Graphing quadratics
- Applications

Exponential and Logarithmic Functions

- Exponential growth and decay
- Graphs of exp. and log functions
- Solving exp. and log equations
- Properties

- Applications

Polynomials

- Operations
- Solving, recognizing zeros, remainder theorem, graphing
- Synthetic and long division

According to the Common Core writers "when suitable factorizations are available" would indicate that students do not need to process through long or synthetic division in the process of analyzing polynomial functions. The use of synthetic and long division should be included as an extension or as a component of critically solving a polynomial function. It is no longer a required component of this evidence outcome. Long division is used in A2.2.3.g (Algebra 2, Standard 2, Concept and Skill 3, Evidence Outcome g) when rewriting rational functions.

Rational Functions and Radical Functions

- Rewrite and solve simple rational equations
(Unsure about operations and graphing)

Operations on rational expressions is a part of A2.2.1.e.i and A2.2.3.a.ii.2, using the structure of an expression to rewrite it and building new functions from existing functions. Understanding how to add, subtract, multiply and divide rational expressions using the key understandings of number operations as well as ability to work with increasingly complex manipulations will prepare students for higher level mathematics and problem-solving.

Graphing rational or radical functions is not explicitly stated in the high school standards for mathematics. The addition of these topics can be used, with technology and without, to extend student understandings and to complete the spectrum of understanding the basic graphing shapes and the impacts of transformations. Graphing these functions is no longer a required component of Algebra 2.

- Solve and simplify radicals

Sequences and Series

- Arithmetic and Geometric Sequences and Series
- Finding the sum of a finite geometric series and using the sum formula

Stats

- Mean and standard deviation
- Normal Distribution
- Area under the normal distribution
- Random sampling
- Data generating process
- Margin of error
- Define and explain the meaning of significance both statistical (using p-values) and practical (using effect size)

Trigonometry

- Right triangle trig
- Trig functions of any angle
- Radian measure and arc length
- Unit circle
- Fundamental trig identities
- Graphing trig functions and applications (period, amplitude and mid-line)