



Pacing Guide

Algebra Functions and Data Analysis

*Robert E. Lee High School
Staunton City Schools
Staunton, Virginia
August 2012*

Pacing For Algebra Functions and Data Analysis

Week(s)	Organizing Topics	Related Standards of Learning
1-2 Q2	CH 2 Linear Functions	AFDA.1, AFDA.2, AFDA.3, AFDA.4
3-4 Q2	CH 3 Systems of Equations and Linear Programming	AFDA.5
5-6 Q2	CH 4.1 - 4.7 Quadratic Functions	AFDA.1, AFDA.2, AFDA.3, AFDA.4
7-8 Q1	CH 5 (skip 5.13, 5.14 & 5.15 Solve graphically)	AFDA.1, AFDA.2, AFDA.3, AFDA.4
9 Q1	Review for Final Exam	
1-3 Q2	CH 7.1 - 7.9 Basic Statistics	AFDA.8
4-6 Q2	CH 6 Probability	AFDA.6
6-8 Q2	CH 7.10 – 7.12 Normal Distributions	AFDA.7
9 Q2	Review for exam / Project	AFDA.6, AFDA.7, AFDA.8

Second Semester Project

7.4 Turn in Idea for an Experiment

7.6 How to Sample

7.7 Turn in actual Survey

Outline of experimental design p 847

Get Data

7.9 One variable statistics on their data, Box and Whisker and Histogram

7.12 Normal distributions, Basic Probability

3 Lab days and presentation for exam

CH 1 Properties, Equations, and Inequalities

AII.1 The student will **identify field properties, axioms of equality and inequality, and properties of order that are valid for the set of real numbers and its subsets**, complex numbers, and matrices.

AII.4 The student will **solve absolute value equations and inequalities graphically and algebraically**. Graphing calculators will be used as a primary method of solution and to verify algebraic solutions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.1	<p>(Introduce) Place the following sets of numbers in a hierarchy: complex numbers, pure imaginary numbers, real numbers, rational and irrational numbers, integers, whole numbers and natural numbers. Venn diagrams may be used.</p> <p>Investigate the commutativity and associativity of combinations of transformations.</p> <p>Identify examples of the field properties of real numbers and the properties of equality that occur while solving equations.</p>	<p>Place</p> <p>Investigate</p> <p>Identify</p>	<p>Match properties with examples of properties http://regentsprep.org/Regents/math/realnum/propT2.htm</p> <p>Complete practice assignments at the same webpage</p>	<p>Collect practice sheets</p>
AII.4	<p>Evaluate expressions that contain absolute value.</p> <p>Solve absolute value equations algebraically and graphically.</p>	<p>Evaluate</p> <p>Solve</p>	<p>Textbook assignment</p> <p>Optional: Graph to Solve</p>	<p>Collect assignment</p>

*Notes: R= rubric needed

L= develop “look fors”

P= create project

M= write multiple choice test

CH 1 Properties, Equations, and Inequalities

AII.1 The student will identify field properties, axioms of equality and inequality, and properties of order that are valid for the set of real numbers and its subsets, complex numbers, and matrices.

AII.4 The student will solve absolute value equations and inequalities graphically and algebraically. Graphing calculators will be used as a primary method of solution and to verify algebraic solutions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.1	Identify examples of the properties of inequality and order that occur while solving inequalities.	Identify	Match properties with examples of properties http://regentsprep.org/Regents/math/realnum/propT2.htm Complete practice assignments at the same webpage	Collect practice sheets
AII.4	Solve absolute value inequalities algebraically and graphically.	Solve	Textbook assignment Use Land of GorE Optional: Graph to Solve	Collect assignment

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CH 2 Linear Equations and Functions

- AII.8 The student will **recognize** multiple representations of **functions (linear, quadratic, absolute value, step, and exponential functions) and convert between a graph, a table, and symbolic form. A transformational approach to graphing will be employed through the use of graphing calculators.**
- AII.19 The student will **collect and analyze data to make predictions and solve practical problems. Graphing calculators will be used to investigate scatter plots and to determine the equation for a curve of best fit. Models will include linear, quadratic, exponential, and logarithmic functions.**

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.19	<p>Collect data and display it in a scatter graph.</p> <p>Determine the equation of the curve of best fit using the graphing calculator. Consider the graphs of the parent functions when determining which curve might be appropriate. Use the equation to make predictions. <i>LINEAR ONLY</i></p>	<p>Collect</p> <p>display</p> <p>determine</p> <p>consider</p> <p>Use</p>	<p>Scatter Plot activities in teach res/Alg II res/ CH 2</p>	<p>Collect activity sheet</p>
AII.8	<p>Given an equation of a linear function, sketch the graph of the function.</p> <p>Given the equation of a parent graph, vary the coefficients and constants of a linear equation, observe the changes in the graph of the parent, and generalize the changes to the graphs of other linear functions.</p> <p>Build a strong connection between the algebraic and geometric representations of linear functions.</p> <p>Recognize the graphs and equations of parent functions such as $y = x$, $y = x^2$, $y = x^3$, $y = x$, $y = a^x$, step functions, and other polynomial functions.</p>	<p>Sketch</p> <p>Observe</p> <p>change</p> <p>Generalize</p> <p>connect</p> <p>recognize</p>	<p>Gizmo: Slope-Intercept Form of a Line - Activity A</p> <p>Graphing calc activity:www.ttaonline.com</p> <p>enhanced SOLs: Transformationally Speaking</p> <p>Abs Value and Step Function activities in teach res/Alg II res/ CH 2</p>	<p>Written test</p> <p>Collect activity</p>

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CH 2 Linear Equations and Functions

- AII.9 The student will find the domain, range, zeros, and inverse of a function; **the value of a function for a given element in its domain**; and the composition of multiple functions. Functions will include exponential, logarithmic, and those that have domains and ranges that are limited and/or discontinuous. The graphing calculator will be used as a tool to assist in investigation of functions.
- AII.20 The student will **identify, create, and solve practical problems involving** inverse variation and a combination of **direct** and inverse variations.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.9	Find the value of a function for a given element of the domain.	Find	Textbook practice	Check assignment
AII.20	Identify direct variation. Solve problems involving direct variation.	Identify Solve	<i>Application</i> problems in text	Written test

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CH 3 Linear Systems and Matrices

AII.13 The student will solve practical problems, using systems of linear inequalities and linear programming, and describe the results both orally and in writing. A graphing calculator will be used to facilitate solutions to linear programming problems.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.13	<p>Linear Inequalities: Solve a system of linear inequalities by graphing.</p> <p>Identify examples of the properties of inequality and order that occur while solving inequalities.</p> <p>Find the maximum and minimum values of a function over a region (linear programming).</p> <ul style="list-style-type: none"> • Identify the constraints in a practical situation and model them as inequalities. • Graph the system of inequalities and identify the area of intersection as the feasible region. The feasible region contains all solutions possible. • The maximum and minimum values of the function occur at the vertices of the feasible region. Substitute the coordinates of each vertex of the feasible region into the function to determine which vertex yields the maximum (or minimum) value of the function. <p>Describe the results of a linear programming problem orally and in writing.</p>	<p>Solve</p> <p>Identify</p> <p>Find</p> <p>Model</p> <p>Graph</p> <p>Substitute</p> <p>Determine</p> <p>Describe</p>	<p><i>Application</i> problems in textbook</p> <p>www.explorellearning.com</p> <p>gizmo:Linear Inequalities in Two Variables Linear Programming</p> <p>textbook practice</p>	<p>Check Assignment</p>

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CH 3 Linear Systems and Matrices

AII.1 The student **will identify field properties**, axioms of equality and inequality, and properties of order that are valid for the set of real numbers and its subsets, complex numbers, and **matrices**.

AII.11 The student **will use matrix multiplication to solve practical problems. Graphing calculators or computer programs with matrix capabilities will be used to find the product.**

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.11	Organize data into matrices and identify the dimensions of the matrix.	Organize	Matrix activities in teach res/Alg II res/ CH 3	Collect activities
AII.1	Investigate commutativity and associativity of matrix addition. Compare and contrast matrix addition with addition of real numbers.	Investigate Compare contrast	Textbook practice	Check assignment
AII.11	Multiply matrices using a calculator or a computer with matrix capability. Solve problems that require matrix multiplication.	Multiply Solve	Matrix activities in teach res/Alg II res/ CH 3	Collect activities
AII.1	Investigate commutativity and associativity of matrix multiplication. Compare and contrast matrix multiplication with multiplication of real numbers.	Investigate Compare contrast	Matrix activities in teach res/Alg II res/ CH 3 Textbook practice	Collect activities

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CH 3 Linear Systems and Matrices

AII.12 The student will represent problem situations with a system of linear equations and solve the system, using the inverse matrix method. Graphing calculators or computer programs with matrix capability will be used to perform computations.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery* (See Notes)
AII.12	Find the determinant of a square matrix. Identify the identity matrix (I). For a matrix A, find the inverse matrix A^{-1} (if it exists) such that $A * A^{-1} = A^{-1} * A = I$. Use an inverse matrix to solve matrix equations. Use the graphing calculator or a computer application with matrix capabilities.	Find Identify Use Solve	Matrix activities in teach res/Alg II res/ CH 3 http://www.analyze-math.com/matrix-multiplication/matrix-multiplication.html	Collect activities
AII.12	Compare and contrast solving matrix equations and linear equations.	Compare Contrast	Matrix activities in teach res/Alg II res/ CH 3	Collect activities
AII.12	Represent a system of equations as a matrix equation where the coefficient matrix times the variable matrix equals the constant matrix.	Represent	Matrix activities in teach res/Alg II res/ CH 3	Collect activities
AII.12	Solve systems of linear equations using inverse matrices. Use the graphing calculator or a computer application with matrix capabilities.	Solve Use	Matrix activities in teach res/Alg II res/ CH 3	Collect activities

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CH 4 Quadratic Functions and Factoring

- AII.6 **The student will select, justify, and apply a technique to solve a quadratic equation over the set of complex numbers. Graphing calculators will be used for solving and for confirming the algebraic solutions.**
- AII.5 **The student will identify and factor completely polynomials representing the difference of squares, perfect square trinomials, the sum and difference of cubes, and general trinomials.**
- AII.19 **The student will collect and analyze data to make predictions and solve practical problems. Graphing calculators will be used to investigate scatter plots and to determine the equation for a curve of best fit. Models will include linear, quadratic, exponential, and logarithmic functions.**

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.6	Find the roots of a function algebraically and graphically. Quadratic equations may be solved using a variety of techniques which include but are not limited to factoring to use the zero product property, square roots, the quadratic formula, completing the square, and graphing.	Find Solve	Gizmo: www.explorellearning.com	Check for understanding
AII.5	Factor polynomials completely (difference of two squares, perfect square trinomials, general trinomials, sum and difference of cubes).	Factor	Gizmo: modeling factoring www.ttaonline.com (Alg I) Functionality, p. 141	Collect activity
AII.19	Collect data and display it in a scatter graph. Determine the equation of the curve of best fit using the graphing calculator. Consider the graphs of the parent functions when determining which curve might be appropriate. Use the equation to make predictions. <i>Quadratic, linear</i>	Collect Display Determine Consider Use	Textbook activity 4.10	Check assignment

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CH 4 Quadratic Functions and Factoring

AII.8 The student will **recognize multiple representations of functions** (linear, **quadratic**, absolute value, step, and exponential functions) and **convert between a graph, a table, and symbolic form. A transformational approach to graphing will be employed through the use of graphing calculators.**

AII.10 The student will investigate and describe through the use of graphs the relationships between the solution of an equation, zero of a function, *x*-intercept of a graph, and factors of a polynomial expression. **Just Quadratic.**

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.8	<p>Recognize the graphs and equations of parent functions such as $y = x$, $y = x^2$, $y = x^3$, $y = x$, $y = a^x$, step functions, and other polynomial functions.</p> <p>Apply transformations (translations, reflections, dilations, and rotations) and combinations of transformations to parent graphs.</p> <p>Given an image graph of a function, describe the transformations that were performed on the pre-image and the order in which they could have occurred.</p> <p>Given the equation of a parent graph, vary the coefficients and constants of the equation, observe the changes in the graph of the parent, and generalize the changes to the graphs of other functions.</p> <p>Build a strong connection between the algebraic and geometric representations of functions.</p> <p>Given an equation of a function, sketch the graph of the function.</p>	<p>Recognize</p> <p>Apply</p> <p>Describe</p> <p>Observe change</p> <p>Generalize</p> <p>Connect</p> <p>sketch</p>	<p>Gizmo: Quadratic functions</p> <p>ALgebra II resources\CH 4 Quadratic functions and factoring\Calc Activity Graphing Quadratics.doc</p> <p>State Domain and Range for Parabolas</p>	Collect activity
AII.10	<p>Investigate the relationship between the solutions of an equation, zeros of a function, <i>x</i>-intercepts, and factors of a polynomial.</p> <p><i>Just quadratic.</i></p>	Investigate	<p>ALgebra II resources\CH 4 Quadratic functions and factoring\Calc Activity Zeros of Quadratics.doc</p>	Collect activity

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CH 5 Polynomial Operations and Functions

- AII.5 The student will **identify and factor** completely polynomials representing the difference of squares, perfect square trinomials, **the sum and difference of cubes, and general trinomials.**
- AII.8 The student will recognize multiple representations of functions (linear, quadratic, absolute value, step, and exponential functions) and convert between a graph, a table, and symbolic form. **A transformational approach to graphing will be employed through the use of graphing calculators. Polynomials**
- AII.15 The student will **recognize the general shape of polynomial**, exponential, and logarithmic functions. The graphing calculator will be used as a tool to investigate the shape and behavior of these functions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.5	Factor polynomials completely (difference of two squares, perfect square trinomials, general trinomials, sum and difference of cubes).	Factor	Textbook practice See old textbook for more practice	Check assignment
AII.15 AII.8	Recognize the graphs and equations of parent functions such as $y = x$, $y = x^2$, $y = x^3$, $y = x$, $y = a^x$, step functions, and other polynomial functions. Apply transformations (translations, reflections, dilations, and rotations) and combinations of transformations to parent graphs. Given an image graph of a function, describe the transformations that were performed on the pre-image and the order in which they could have occurred. Given the equation of a parent graph, vary the coefficients and constants of the equation, observe the changes in the graph of the parent, and generalize the changes to the graphs of other functions. Build a strong connection between the algebraic and geometric representations of functions.	Recognize Apply Describe Vary Generalize Build connect	ALgebra II resources\CH 5 Polynomial Functions\8-1 Graphs of Polynomials.doc ALgebra II resources\CH 5 Polynomial Functions\Calc Intro to Graphing Polynomials 1.doc ALgebra II resources\CH 5 Polynomial Functions\Calc Intro to Graphing Polynomials2.doc Exponent rule game: p 24 Enhanced S&S www.ttaonline.com	Check assignment

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CH 5 Polynomial Operations and Functions

AII.10 The student will investigate and describe through the use of graphs the relationships between the solution of an equation, zero of a function, x -intercept of a graph, and factors of a polynomial expression.

AII.17 The student will perform operations on complex numbers and express the results in simplest form. Simplifying results will involve using patterns of the powers of i .

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.10	Investigate the relationship between the solutions of an equation, zeros of a function, x -intercepts, and factors of a polynomial. Given the roots of a polynomial, write an equation for the polynomial function.	Investigate Write	ALgebra II resources\CH 5 Polynomial Functions\8-1 Graphs of Polynomials.doc	Collect assignment
AII.17	Recognize a complex number as a number that can be written as $a + bi$ where a and b are real numbers and i is the principal square root of -1 . Recognize pure imaginary numbers. Simplify square roots with negative arguments. Represent a complex number geometrically in the coordinate plane. Add, subtract, and multiply complex numbers. Compare and contrast adding, subtracting, and multiplying complex numbers with operating on real numbers. Simplify powers of i and generalize the pattern. Simplify rational expressions with complex numbers in the denominator by using complex conjugates.	Recognize Simplify Represent Compute Compare Contrast	http://regentsprep.org/Regents/math/b/3c1/SquareRootT.htm Complete activity and practice assignments at this web page	Collect assignment

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CH 6 Rational Exponents and Radical Functions

AII.9 The student will **find** the domain, range, zeros, **and inverse of a function**; the value of a function for a given element in its domain; **and the composition of multiple functions**. Functions will include exponential, logarithmic, and those that have domains and ranges that are limited and/or discontinuous. The graphing calculator will be used as a tool to assist in investigation of functions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.9	<p>Find the composition of functions algebraically and graphically.</p> <p>Given the graph or the equation of a function, identify the domain and range of the function. Include functions with discontinuities.</p> <p>Find the inverse of a function algebraically and graphically.</p> <p>Explain how composition of functions and finding the inverse of a function affects the domain and range of the functions.</p>	<p>Find</p> <p>Identify</p> <p>explain</p>	<p>Textbook practice</p> <p>ALgebra II resources\CH 6 Rational Exponents, Radicals, Inverses, Composition\WS Composition of Functions.doc</p> <p>ALgebra II resources\CH 6 Rational Exponents, Radicals, Inverses, Composition\Domain and Range of Functions.doc</p> <p>ALgebra II resources\CH 6 Rational Exponents, Radicals, Inverses, Composition\Domain and Range of Functions no graphs.doc</p> <p>State Domain and Range for Radical Functions</p>	<p>Check assignment</p> <p>Check assignment</p> <p>Check assignment</p> <p>Check assignment</p>

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CH 7 Exponential and Logarithmic Functions

AII.8 The student will recognize multiple representations of functions (linear, quadratic, absolute value, step, and exponential functions) and convert between a graph, a table, and symbolic form. A transformational approach to graphing will be employed through the use of graphing calculators.

AII.9 The student will find the domain, range, zeros, and inverse of a function; the value of a function for a given element in its domain; and the composition of multiple functions. Functions will include exponential, logarithmic, and those that have domains and ranges that are limited and/or discontinuous. The graphing calculator will be used as a tool to assist in investigation of functions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.8	<p>Recognize multiple representations of exponential and logarithmic functions and convert between a graph, a table, and symbolic form.</p> <p>Given an equation of a function, sketch the graph of the function.</p> <p>Given the equation of a parent graph, vary the coefficients and constants, observe the changes in the graph of the parent, and generalize the changes to the graphs of other functions.</p> <p>Build a strong connection between the algebraic and geometric representations of functions.</p>	<p>Recognize</p> <p>Convert</p> <p>Sketch</p> <p>Vary</p> <p>Connect</p>	<p>ALgebra II resources\CH 7 Exponential and Log Functions\Graphing Log Functions Table.doc</p> <p>ALgebra II resources\CH 7 Exponential and Log Functions\Graphing Exponential Functions Table.doc</p> <p>Alg II CH 7 Folder translation WS</p> <p>Not emphasized on SOL</p> <p>ALgebra II resources\CH 7 Exponential and Log Functions\Exponential Function Weblinks.doc</p>	Collect activities
AII.9	<p>Given the graph or the equation of a function, identify the domain and range of the function. Include functions with discontinuities.</p> <p>Demonstrate that the exponential and logarithmic functions are inverse functions.</p> <p>Given the graph or the equation of a function, identify the domain and range of the function.</p>	<p>Identify</p> <p>Demonstrate</p>	<p>Textbook practice</p> <p>State Domain and Range for Log and Exp Functions www.ttaonline.com p116</p> <p>Enhance Scope and Sequence</p> <p>Gizmo: www.explorelarning.com</p> <p>Logarithmic Functions - Activity A,B</p>	Check assignment

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CH 7 Exponential and Logarithmic Functions

AII.15 The student will **recognize the general shape of polynomial, exponential, and logarithmic functions**. The graphing calculator will be used as a tool to investigate the shape and behavior of these functions.

AII.19 **The student will collect and analyze data to make predictions and solve practical problems. Graphing calculators will be used to investigate scatter plots and to determine the equation for a curve of best fit. Models will include linear, quadratic, exponential, and logarithmic functions.**

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.15	<p>Apply transformations (translations, reflections, dilations, and rotations) and combinations of transformations to parent graphs.</p> <p>Given an image graph of a function, describe the transformations that were performed on the pre-image and the order in which they could have occurred.</p> <p>Given the equation of a parent graph, vary the coefficients and constants of the equation, observe the changes in the graph of the parent, and generalize the changes to the graphs of other functions.</p> <p>Build a strong connection between the algebraic and geometric representations of functions.</p> <p>Given an equation of a function, sketch the graph of the function.</p>	<p>Apply</p> <p>Describe</p> <p>Vary</p> <p>Connect</p> <p>sketch</p>	<p>Alg II CH 7 Folder <u>translation</u> WS</p> <p>Not emphasized on SOL</p>	Check assignment
AII.19	<p>Collect data and display it in a scatter graph.</p> <p>Determine the equation of the curve of best fit using the graphing calculator. Consider the graphs of the parent functions when determining which curve might be appropriate. Use the equation to make predictions.</p>	<p>Collect</p> <p>Display</p> <p>Determine</p> <p>Consider</p> <p>use</p>	<p>ALgebra II resources\CH 7 Exponential and Log Functions\Exponential and Logarithmic Regressions.doc</p> <p>Textbook lessons 7-7 and 11-5</p> <p>M&M activity p109 Enhanced S&S</p> <p>www.ttaonline.com</p>	Check assignment

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CH 8 Rational Functions

- AII.2 **The student will add, subtract, multiply, divide, and simplify rational expressions, including complex fractions.**
- AII.7 **The student will solve equations containing rational expressions and equations containing radical expressions algebraically and graphically. Graphing calculators will be used for solving and for confirming the algebraic solutions.**
- AII.20 **The student will identify, create, and solve practical problems involving inverse variation and a combination of direct and inverse variations.**
- AII.9 The student will **find the domain, range**, zeros, and inverse **of a function**; the value of a function for a given element in its domain; and the composition of multiple functions. Functions will include exponential, logarithmic, and those that have domains and ranges that are limited and/or discontinuous. The graphing calculator will be used as a tool to assist in investigation of functions.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.20	Identify a variation as direct, inverse, or joint. Solve practical problems involving joint variation.	Identify Solve	Textbook practice	Check assignment
AII.7	Simplify rational algebraic expressions. Compare simplifying rational algebraic expressions to simplifying fractions.	Simplify compare	Textbook practice	Check1 assignment
AII.2	Add, subtract, multiply, and divide rational algebraic expressions including complex fractions.	compute	Textbook practice	Check assignment
AII.7	Solve rational equations algebraically and graphically. The graphing calculator will be used as a primary tool for solution and for checking the algebraic solution.	Solve check	Textbook practice	Check assignment
AII.9	State the domain and range of a rational function. Identify the vertical and horizontal asymptotes of a rational function. Sketch the graph of a rational function.	State Identify sketch	ALgebra II resources\CH 6 Rational Exponents, Radicals, Inverses, Composition\Domain and Range of Functions.doc ALgebra II resources\CH 6 Rational Exponents, Radicals, Inverses, Composition\Domain and Range of Functions no graphs.doc	Check assignment

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CH 9 Conics

AII.14 The student will solve nonlinear systems of equations, including linear-quadratic and quadratic-quadratic, algebraically and graphically. The graphing calculator will be used as a tool to visualize graphs and predict the number of solutions.

AII.18 The student will identify conic sections (circle, ellipse, parabola, and hyperbola) from his/her equations. Given the equations in (h, k) form, the student will sketch graphs of conic sections, using transformations.

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.18	<p>Recognize the graphs of the conic sections defined as any figure that can be formed by slicing a double cone (parabola, ellipse, circle, and hyperbola).</p> <p>Given an equation, identify the conic section and graph it transformationally.</p> <p>Build a strong connection between the algebraic and geometric representations of functions.</p> <p>Given an equation of a function, sketch the graph of the function.</p>	<p>Recognize Identify Connect sketch</p>	<p>Gizmo: www.explorellearning.com</p> <p>Textbook assignment</p> <p>ALgebra II resources\CH 9 Conics</p>	<p>Check assignment</p>
AII.14	<p>Solve linear-quadratic systems of equations algebraically and identify the set of ordered pairs that is the solution to the system.</p> <p>Solve linear-quadratic systems of equations graphically and identify the set of ordered pairs that is the solution to the system.</p> <p>Solve quadratic-quadratic systems of equations algebraically and identify the set of ordered pairs that is the solution to the system.</p> <p>Solve quadratic-quadratic systems of equations graphically and identify the set of ordered pairs that is the solution to the system.</p>	<p>solve</p>	<p>Textbook assignment</p>	<p>Check assignment</p>

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CH 12 Sequences and Series

AII.16 The student will investigate and apply the properties of arithmetic and geometric sequences and series to solve practical problems, including writing the first n terms, finding the n^{th} term, and evaluating summation formulas. Notation will include Σ and a_n .

Related SOL	Essential Knowledge and Skills Students should be able to:	Verb	Strategies to Engage the Learner The learner will . . .	Evidence of Mastery*(See Notes)
AII.16	<p>Find the next term in a sequence by looking for a pattern.</p> <p>Find the n^{th} term of an arithmetic sequence and find the position of a given term in an arithmetic sequence.</p> <p>Find arithmetic means.</p> <p>Differentiate between a sequence and a series.</p> <p>Find the sum of an arithmetic series.</p> <p>Find specific terms in an arithmetic series.</p> <p>Use sigma (Σ) notation to denote sums.</p> <p>Compare and contrast arithmetic and geometric sequences.</p> <p>Find the n^{th} term of a geometric sequence and the position of a given term in a geometric sequence.</p> <p>Find geometric means.</p> <p>Find the sum of a geometric series.</p> <p>Find specific terms in a geometric series.</p>	<p>Find</p> <p>Differentiate</p> <p>Use</p> <p>Compare</p> <p>contrast</p>	<p>Textbook assignment</p> <p>Excel activity for summing series (create)</p>	<p>Check assignment</p> <p>Collect activity</p>

Additional Topics for Algebra II Honors

- Find the sum of an infinite geometric series.
- Count the number of permutations and combinations possible in a given situation. Use counting techniques in binomial experiments to determine binomial probabilities.
- Graph points and equations in three dimensions.
- Solve exponential and logarithmic equations.
- Use synthetic division and synthetic substitution to find all complex roots of a polynomial function.
- Study parametric equations and the graphs of parametric equations.

Resources

- NASA <http://spacelink.nasa.gov/index.html>
- The Math Forum <http://forum.swarthmore.edu/>
- 4teachers <http://www.4teachers.org>
- Appalachia Educational Laboratory (AEL) <http://www.ael.org/pnp/index.htm>
- Eisenhower National Clearinghouse <http://www.enc.org/>
- *Algebra Instructional Modules*
- Virginia Algebra Resource Center <http://curry.edschool.virginia.edu/k12/algebra>
- NASA <http://spacelink.nasa.gov/index.html>
- The Math Forum <http://forum.swarthmore.edu/>
- 4teachers <http://www.4teachers.org>
- Appalachia Educational Laboratory (AEL) <http://www.ael.org/pnp/index.htm>
- Eisenhower National Clearinghouse <http://www.enc.org/>
- Mathematics SOL Teacher Resource Guide
http://www.pen.k12.va.us/VDOE/Instruction/math_resource.html
- SOL Test Released Items
- Appalachia Educational Laboratory (AEL) <http://www.ael.org/pnp/index.htm>