

DeSoto County High School

Algebra 2 Honors

Curriculum Calendar

2011-2012

UNIT/ORGANIZING PRINCIPLE: Linear Equations			Pacing: 1 st 9-weeks Days 1 - 15	
<u>Essential Question:</u> How can linear data be represented with an equation or graph?			Big Idea : Linear Equations	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Slope Linear Equations Linear Graphs Variation	<p>Graph <u>absolute value equations</u> and inequalities in two <u>variables</u></p> <p>Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, <u>radical</u>, <u>absolute value</u>).</p> <p>Perform <u>operations</u> (addition, subtraction, division, and multiplication) of <u>functions</u> algebraically, numerically, and graphically.</p> <p>Recognize, interpret, and graph <u>functions</u> defined piece-wise with and without technology.</p> <p>Describe and graph <u>transformations</u> of <u>functions</u></p> <p>Solve problems using direct, inverse, and <u>joint variations</u>.</p>	<p>MA.912.A.2.5 moderate</p> <p>MA.912.A.2.6 moderate</p> <p>MA.912.A.2.7 moderate</p> <p>MA.912.A.2.9 moderate</p> <p>MA.912.A.2.10 moderate</p> <p>MA.912.A.2.12 high</p>	<p>compute slope using various methods</p> <p>write equations of lines using multiple methods</p> <p>compare and contrast equations pertaining to parallel and perpendicular lines</p> <p>solve problems using direct variation</p> <p>graph piece-wise functions</p> <p>use x- and y-intercepts to graph functions</p> <p>graph scatter Plots and understand Linear Regression</p>	<p>Slope Rate of Change Parallel Lines Perpendicular Lines</p>

UNIT/ORGANIZING PRINCIPLE: Systems of Linear Equations and Inequalities			Pacing: 1st 9-weeks Day 16 - 33	
<u>Essential Question:</u> How do you determine the best method for solving linear systems?			Big Idea : Systems	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
System of Equations Linear Inequalities Systems of Linear Inequalities Linear Programming	Solve systems of linear <u>equations</u> and <u>inequalities</u> in two and three <u>variables</u> using graphical, substitution, and elimination methods. Solve <u>real-world problem</u> s involving systems of linear <u>equations</u> and <u>inequalities</u> in two and three <u>variables</u> . Graph <u>absolute value equations</u> and <u>inequalities</u> in two <u>variables</u> .	MA.912.A.3.14 moderate MA.912.A.3.15 high MA.912.A.2.5 moderate	solve a system by graphing solve a system by substitution solve a system by linear combination find the intersection of two or more lines graph a linear inequality graph a system of two or more inequalities recognize included and non-included values in the solution set linear programming solve a system using matrices	Systems Substitution Linear Combination Optimization Linear Programming Objective Function Constraints

UNIT/ORGANIZING PRINCIPLE: Quadratic Functions			Pacing: 1 st /2 nd 9-weeks Day 34 - 53	
Essential Question: How do you determine which method can be used to solve a quadratic equation?			Big Idea : Quadratics	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Quadratic Equations Quadratic Graphs Domain and Range	Identify the real and <u>imaginary part s</u> of <u>complex number s</u> and perform basic <u>operations</u> . Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, radical, <u>absolute value</u>). Describe and graph <u>transformations</u> of <u>functions</u> <u>Factor polynomial expressions</u> Use <u>polynomial equations</u> to solve <u>real-world problems</u> . Solve a <u>polynomial inequality</u> by examining the graph with and without the use of technology. Solve quadratic <u>equations</u> over the <u>real number s</u> by completing the <u>square</u> . Use the <u>discriminant</u> to determine the nature of	MA.912.A.1.6 moderate MA.912.A.2.6 moderate MA.912.A.2.10 moderate MA.912.A.4.3 moderate MA.912.A.4.10 moderate MA.912.A.4.11 moderate MA.912.A.7.3 moderate MA.912.A.7.4	use various methods of factoring quadratic expression use operations with complex numbers. use the quadratic formula to find the solutions to a quadratic equation solve quadratic equations by using square roots use technology to approximate the intercepts of the quadratic equation use the discriminant to determine the type and number of solutions state the zeros of the quadratic function	Quadratic Zeros Roots x-intercepts Factoring Discriminant Imaginary Unit Max Min Axis of Symmetry Parabola

	<p>the <u>roots</u> of a quadratic <u>equation</u>.</p> <p>Solve quadratic <u>equations</u> over the <u>complex number</u> system.</p> <p>Use graphing technology to find <u>approximate</u> solutions of quadratic <u>equations</u>.</p>	<p>low</p> <p>MA.912.A.7.5 moderate</p> <p>MA.912.A.7.10 low</p>	<p>state the axis of symmetry of the quadratic function</p>	
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UNIT/ORGANIZING PRINCIPLE: Polynomials and Their Functions			Pacing: 2 nd 9-weeks Day 54 - 73	
Essential Question: How are polynomial functions written, graphed, and used to solve real-world problems? How are operations on polynomials performed? What techniques and theorems are used to find the zeros of polynomial functions			Big Idea : Polynomials	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Solving Polynomials Operations with Polynomials Fundamental Theorem of Algebra and Remainder Theorem Properties of Exponents	Apply the Binomial <u>theorem</u>	MA.912.A.4.12 moderate	use the Binomial Theorem to expand binomials	Binomial Polynomial Root Solution Zero Maximum Minimum End Behavior
	Graph <u>polynomial functions</u> with and without technology and describe <u>end behavior</u> .	MA.912.A.4.5 moderate	graph polynomial functions and identify the beginning and end behavior of polynomial functions	
	Describe the relationships among the solutions of an <u>equation</u> , the zeros of a <u>function</u> , the x-intercepts of a graph, and the <u>factors</u> of a <u>polynomial expression</u> with and without technology.	MA.912.A.4.8 moderate	finding rational zeros using a graphing calculator analyze the graph of a polynomial function	
	Use graphing technology to find <u>approximate solutions</u> for <u>polynomial equations</u> .	MA.912.A.4.9 low	use the graph of a polynomial function to solve real-world problems	
	<u>factor polynomial expressions</u> .	MA.912.A.4.3 moderate	determine the local minimums and maximums for polynomial functions	
Use <u>polynomial equations</u> to solve <u>real-world problems</u> .	MA.912.A.4.10 moderate	add, subtract, multiply and divide polynomials		

	<p>Divide <u>polynomials</u> by <u>monomials</u> and <u>polynomials</u> with various techniques, including <u>synthetic division</u> .</p> <p><u>simplify expressions</u> using properties of rational <u>exponents</u></p> <p>Use <u>theorems</u> of <u>polynomial</u> behavior (including but not limited to the Fundamental <u>theorem</u> of Algebra, <u>remainder theorem</u>, the Rational <u>root theorem</u>, Descartes' <u>rule</u> of Signs, and the Conjugate <u>root</u> Theorem) to find the zeros of a <u>polynomial function</u>.</p>	<p>MA.912.A.4.4 moderate</p> <p>MA.912.A.6.3 low</p> <p>MA.912.A.4.6 moderate</p>	<p>apply properties of exponents</p>	
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UNIT/ORGANIZING PRINCIPLE: Powers, Roots, and Radicals			Pacing: 2 nd / 3 rd 9-weeks day 74 - 98	
Essential Question: How do the properties of radical expressions assist when solving radical equations?			Big Idea : Exponents	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Simplifying Radicals Solving Radical Equations Operations with Rational Exponents Composition of Functions Inverse of Functions Graphing Square Root and Cubed Root Functions	Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, <u>radical</u> , <u>absolute value</u>). Solve <u>equations</u> that contain <u>radical expressions</u> Add, subtract, multiply, and divide <u>radical expressions</u> (square <u>roots</u> and higher). <u>simplify expressions</u> using properties of rational <u>exponents</u> . Convert between rational <u>exponent</u> and <u>radical</u> forms of <u>expressions</u> . Perform <u>operations</u> (addition, subtraction, division, and multiplication) of <u>functions</u> algebraically, numerically, and graphically. Determine the <u>composition of functions</u> .	MA.912.A.2.6 moderate MA.912.A.6.5 moderate MA.912.A.6.2 moderate MA.912.A.6.3 low MA.912.A.6.4 low MA.912.A.2.7 moderate MA.912.A.2.8 low	graph a radical function use radicals equations to solve real-life problems solve equations that contain radicals or rational exponents evaluate nth roots of real numbers using both radical notation and rational exponent notation use properties of rational exponents to evaluate and simplify expressions function Notation composition of functions finding inverses of functions	Power Functions Composition of Functions Simplest Form Inverse Relation

	Solve problems involving <u>functions</u> and their inverses.	MA.912.A.2.11 high	combining functions	
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UNIT/ORGANIZING PRINCIPLE: Exponential and Logarithmic Functions			Pacing: 3 rd 9-weeks Day 99 - 121	
Essential Question: How do we use inverses to solve logarithmic or exponential equations? Can students explain the relationship between exponential and logarithmic functions?			Big Idea : Exponents and Logarithms	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Graphing Exponential and Logarithmic Functions	Define exponential and logarithmic <u>functions</u> and determine their relationship	MA.912.A.8.1 moderate	graph an exponential function	Asymptote Growth Factor Decay Factor Common Logarithm Natural Logarithm Logistic Growth Function
Exponential Growth and Decay	Solve problems involving <u>functions</u> and their inverses.	MA.912.A.2.11 high	write a logarithmic equation from an exponential equation	
Properties of Logarithms	Graph exponential and logarithmic <u>functions</u> .	MA.912.A.8.3 moderate	graph exponential functions	
Solving Logarithms and Exponential Equations	Solve logarithmic and exponential <u>equations</u> .	MA.912.A.8.5 moderate	solve exponential and logarithmic equations	
	Use the change of base <u>formula</u> .	MA.912.A.8.6 low	use the change of base formula	
	Solve applications of exponential growth and decay.	MA.912.A.8.7 high	identify asymptotes	
	Define and use the properties of <u>logarithms</u> to <u>simplify</u> logarithmic <u>expressions</u> and to find their <u>approximate</u> values.	MA.912.A.8.2 low	identify initial amount, growth/decay factor	
			describe inverse relationship between exponential and logarithmic functions	
			recognize growth and decay situations	

			use the properties of logarithms	
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UNIT/ORGANIZING PRINCIPLE: Rational Equations and Functions			Pacing: 3 rd 9-weeks Day 122 - 139	
Essential Question: In a rational expression and a rational equation, how is it determined what values need to be restricted from the variable solution?			Big Idea : Rational Equations	
Concepts/ Content	Benchmarks	Essential Content and Understanding	Learning Target/Skills	Terminology
Inverse and Joint Variation Graphing Rational Functions Simplifying Rational Expressions and Complex Fractions Solving Rational Equations	Perform <u>operations</u> (addition, subtraction, division, and multiplication) of <u>functions</u> algebraically, numerically, and graphically. Solve problems using direct, inverse, and <u>joint variations</u> . Identify removable and non-removable discontinuities, and vertical, horizontal, and <u>oblique asymptotes</u> of a graph of a rational <u>function</u> , find the zeros, and graph the <u>function</u> . Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, <u>radical</u> , <u>absolute value</u>). Divide <u>polynomials</u> by <u>monomials</u> and <u>polynomials</u> with various techniques, including <u>synthetic division</u> .	MA.912.A.2.7 moderate MA.912.A.2.12 high MA.912.A.5.6 moderate MA.912.A.2.6 moderate MA.912.A.4.4 moderate	write an inverse variation equation write a joint variation equation determine if an equation is direct, inverse or joint variation graph a rational function in the form of $y = 1/x$ graph a rational function in the form of $y = a/(x-h)$ graph a rational function in the form of $y = (ax+b)/(cx+d)$ identify the vertical and horizontal asymptotes	Inverse Variation Constant of Variation Joint Variation Complex Fraction

UNIT/ORGANIZING PRINCIPLE: Conics			Pacing: 4 th 9-weeks Day 140 - 161	
Essential Question: Why is it necessary to know the standard form equations for conic sections?			Big Idea : Conics	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Using Distance and Midpoint Formulas	Describe and graph <u>transformations</u> of <u>functions</u>	MA.912.A.2.10 moderate	identify the asymptotes, foci, and eccentricity	Asymptote Foci Eccentricity Conic Ellipse Hyperbola
Relate Conic to its Equation	Write the <u>equations</u> of <u>conic section</u> s in standard form and general form, in order to identify the <u>conic section</u> and to find its geometric properties (foci, <u>asymptotes</u> , <u>eccentricity</u> , etc.).	MA.912.A.9.1 moderate	produce graph by hand and using graphing technology	
Systems of Quadratic Equations	Solve quadratic <u>equations</u> over the <u>real number</u> s by completing the <u>square</u> .	MA.912.A.7.3 moderate	given the graph find the equation given the equation find the graph	
	Graph <u>conic section</u> s with and without using graphing technology.	MA.912.A.9.2 moderate	solve systems of quadratic equations	
	Solve non-linear systems of <u>equations</u> with and without using technology.	MA.912.A.7.7 high	model real-life situations with quadratic systems	

UNIT/ORGANIZING PRINCIPLE: Sequences and Series			Pacing: 4th 9-weeks Day 162 - 180	
Essential Question: How can deriving a formula for a mathematical pattern assist in gathering new data?			Big Idea : Sequences and Series	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
<p>Write Formulas for Arithmetic and Geometric Sequences</p> <p>Find Specific Terms of an Arithmetic and Geometric Sequences</p> <p>Find Sums of Arithmetic and Geometric Series</p>	<p>Define arithmetic and geometric <u>sequences</u> and <u>series</u>.</p> <p>Use sigma notation to describe <u>series</u>.</p> <p>Find specified terms of arithmetic and geometric <u>sequences</u>.</p> <p>Find partial <u>sums</u> of arithmetic and geometric <u>series</u>, and find <u>sums</u> of <u>infinite</u> convergent geometric <u>series</u>. Use Sigma notation where applicable.</p>	<p>MA.912.D.11.1 low</p> <p>MA.912.D.11.2 low</p> <p>MA.912.D.11.3 low</p> <p>MA.912.D.11.4 moderate</p>	<p>differentiate arithmetic and geometric sequences and series</p> <p>find a specified term of arithmetic and geometric sequences</p> <p>find partial sums of arithmetic and geometric series</p>	<p>Finite Sequence Infinite Sequence Series Summation Notation Sigma Notation Arithmetic Sequence Common Difference Arithmetic Series Geometric Sequence Geometric Series Common Ratio</p>

UNIT/ORGANIZING PRINCIPLE: Additional Learning Strategies			Pacing: Throughout course where appropriate	
Essential Question: Can the student use appropriate language arts strategies to achieve success in mathematics?			Big Idea : Learning Strategies	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
N/A	<p>The student will use new vocabulary that is introduced and taught directly.</p> <p>The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions).</p>	<p>LA.910.1.6.1</p> <p>LA.910.4.2.1</p>	<p>The student will use new vocabulary that is introduced and taught directly.</p> <p>The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions).</p>	N/A