

DeSoto County High School

Algebra II

Curriculum Calendar

2011-2012

UNIT/ORGANIZING PRINCIPLE: Linear Equations			Pacing: 1 <sup>st</sup> 9-weeks Days 1 – 33	
Essential Question: How can linear data be represented with an equation or graph?			Big Idea : Linear Equations	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content and Understanding	Terminology
<p>Linear Equations &amp; Graphs</p> <p>Literal Equations</p>	<p>Write an <u>equation</u> of a <u>line</u> given any of the following information: two <u>points</u> on the <u>line</u>, its <u>slope</u> and one <u>point</u> on the <u>line</u>, or its graph. Also, find an <u>equation</u> of a new <u>line</u> parallel to a given <u>line</u>, or <u>perpendicular</u> to a given <u>line</u>, through a given <u>point</u> on the new <u>line</u>.</p> <p>Solve literal <u>equations</u> for a specified <u>variable</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>Solve and graph the solutions of <u>absolute value equations</u> and inequalities with one <u>variable</u>.</p> <p>Graph <u>absolute value equations</u> and inequalities in two <u>variables</u>.</p> <p>Solve problems using direct, inverse, and <u>joint variations</u>.</p>	<p>MA.912.A.3.10 Moderate</p> <p>MA.912.A.3.3 Moderate</p> <p>MA.912.A.2.6 Moderate</p> <p>MA.912.A.3.6 Moderate</p> <p>MA.912.A.2.5 Moderate</p> <p>MA.912.A.2.12 High</p>	<p>write the equation of a line given two points, a point and a slope, or a graph</p> <p>find the equation of a line parallel or perpendicular to a given line through a given point on the new line</p> <p>solve literal equations for a specified variable</p> <p>solve and graph linear equations</p> <p>solve and graph linear inequalities in one and two variables</p> <p>solve and graph absolute value equations in one and two variables</p> <p>solve problems involving direct variation.</p>	<p>Graph a line</p> <p><b>Slope</b></p> <p>y- intercept</p> <p>Ordered Pair</p> <p>Coordinate Plane</p> <p><b>Linear Function</b></p> <p><b>Slope-intercept form</b></p> <p>Standard form</p> <p>Direct variation</p> <p>Absolute value</p> <p><b>Domain</b></p> <p><b>Range</b></p> <p>Compound inequalities</p>

<b>UNIT/ORGANIZING PRINCIPLE:</b> Systems of Equations			<b>Pacing:</b> 1 <sup>st</sup> /2 <sup>nd</sup> 9-weeks 34 - 54	
<b>Essential Question:</b> How can the best method for solving linear systems be determined?			<b>Big Idea :</b> System of Equations	
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
System of Equations	<p>Solve systems of linear <u>equations</u> and inequalities in two and three <u>variables</u> using graphical, substitution, and elimination methods.</p> <p>Solve <u>real-world problem</u> s involving systems of linear <u>equations</u> and inequalities in two and three <u>variables</u>.</p>	<p>MA.912. A.3.14 Moderate</p> <p>MA.912.A.3.15 High</p>	<p>solve a system of equations &amp; inequalities with two variables by graphing</p> <p>solve a system of equations with two or three variables using substitution</p> <p>solve a system of equations with two or three variables using elimination</p> <p>solve a system of equations &amp; inequalities with three variables using technology</p> <p>write a system of equations to represent a real world situation</p>	<p><b>Substitution</b></p> <p>Linear Combination</p> <p><b>Ordered triple</b></p> <p>Solution</p> <p>Matrix Methods</p>

UNIT/ORGANIZING PRINCIPLE: Quadratic Equations			Pacing: 2 <sup>nd</sup> 9-weeks Days 55 - 76	
Essential Question: How can the best method for solving a quadratic equation be determined?			Big Idea : Quadratics	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Quadratic Equations	Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, <u>radical</u> , <u>absolute value</u> ).	MA.912.A.2.6 Moderate	graph a quadratic function when given standard, intercept and vertex forms	<b>Prerequisite skills:</b> Basic factoring Standard form of a quadratic function x-intercept <b>Vocabulary:</b> Vertex <b>Parabola</b> Complete the square <b>Quadratic formula</b> Complex numbers Zero of function Discriminant <b>Maximum</b> <b>Minimum</b>
	Identify the <u>axis</u> of <u>symmetry</u> , <u>vertex</u> , <u>domain</u> , range and intercept(s) for a given <u>parabola</u> .	MA.912.A.7.6 Low	identify the axis of symmetry, vertex, intercept(s), domain and range	
	Use the <u>discriminant</u> to determine the nature of the <u>roots</u> of a quadratic <u>equation</u> .	MA.912.A.7.4 Low	use the discriminant to determine the nature of the roots	
	Solve quadratic <u>equations</u> over the <u>complex number</u> system.	MA.912.A.7.5 Moderate	solve quadratic equations over the real and complex number systems by factoring, graphing, completing the square and the quadratic formula	
	Solve quadratic <u>equations</u> over the <u>real number</u> s by completing the <u>square</u> .	MA.912.A.7.3 Moderate	identify the real and imaginary parts of a complex number and perform operations with them	
	Identify the real and <u>imaginary part</u> s of <u>complex number</u> s and perform basic <u>operations</u> .	MA.912.A.1.6 Moderate	factor Polynomial Expressions	
	<u>factor polynomial expressions</u>	MA.912.A.4.3 Moderate		

<b>UNIT/ORGANIZING PRINCIPLE: Polynomials</b>			<b>Pacing: 2<sup>nd</sup>/3<sup>rd</sup> 9-weeks Days 77 - 102</b>	
<b>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</b>			<b>Big Idea : Polynomials</b>	
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
Polynomial Operations  Solve Polynomial Equations	<p>Perform <u>operations</u> (addition, subtraction, division, and multiplication) of <u>functions</u> algebraically, numerically, and graphically.</p> <p>Divide <u>polynomials</u> by <u>monomials</u> and <u>polynomials</u> with various techniques, including <u>synthetic division</u> .</p> <p>Graph <u>polynomial functions</u> with and without technology and describe <u>end behavior</u> .</p> <p>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.</p> <p>Use graphing technology to find <u>approximate</u> solutions for <u>polynomial equations</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 <u>Conjugate root</u> Theorem) to find the zeros of a <u>polynomial function</u>.</p>	<p>MA.912.A.2.7 Moderate</p> <p>MA.912.A.4.4 Moderate</p> <p>MA.912.A.4.5 Moderate</p> <p>MA.912.A.4.8 Moderate</p> <p>MA.912.A.4.9 Low</p> <p>MA.912.A.4.6 Moderate</p>	<p>perform addition, subtraction and multiplication with polynomials functions</p> <p>perform long and synthetic division</p> <p>describe end behavior, graph and interpret polynomial functions with and without technology</p> <p>use technology to estimate solutions to real world problems involving polynomials</p> <p>use theorems of polynomial behavior to find zeros of a polynomial function</p> <p>write a polynomial equation given its roots</p> <p>solve real world problems using polynomial equations</p>	<p><b>Zeros of a function</b></p> <p><b>Monomial</b></p> <p><b>Binomial</b></p> <p><b>Trinomial</b></p> <p>Degree</p> <p>Polynomial function</p> <p>End behavior</p> <p>Long division</p> <p>Synthetic division</p> <p>Rational zero theorem</p> <p>Local minimum</p> <p>Local maximum</p> <p>Fundamental theorem of Algebra</p>

	<p>Write a <u>polynomial equation</u> for a given <u>set</u> of real and/or complex <u>roots</u>.</p> <p>Use <u>polynomial equations</u> to solve <u>real-world problems</u>.</p>	<p>MA.912.A.4.7 Moderate</p> <p>MA.912.A.4.10 Moderate</p>		
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<b>UNIT/ORGANIZING PRINCIPLE: Roots and Radicals</b>			<b>Pacing: 3<sup>rd</sup> 9-weeks Days 103 – 124</b>	
<b>Essential Question: How do the properties of radical expressions assist when solving radical equations?</b>			<b>Big Idea : Exponents</b>	
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
<b>Expressions with radical and rational exponents</b>  <b>Equations with radical and rational exponents</b>	Convert between rational <u>exponent</u> and <u>radical</u> forms of <u>expressions</u> .  <u>Simplify expressions</u> using properties of rational <u>exponents</u> .  Add, subtract, multiply, and divide <u>radical expressions</u> (square <u>roots</u> and higher).  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>	MA.912.A.6.4 Low  MA.912.A.6.3 Low  MA.912.A.6.2 Moderate  MA.912.A.2.6 Moderate  MA.912.A.6.5 Moderate	convert between rational exponents and radical forms of expressions  simplify expressions using properties of rational exponents  perform operations on radical expressions  graph radical functions  solve equations involving radical expressions or rational exponents  simplify real number expressions using laws of exponents	<b>Square root exponent</b> Nth root Index <b>Radical functions</b>

UNIT/ORGANIZING PRINCIPLE: Functions				Pacing: 3 <sup>rd</sup> 9-weeks Days 125 – 131
Essential Question: What strategies are used to recognize, interpret and graph common functions?				Big Idea : Functions
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Identify Functions Transformations of Functions Operations on Functions	Identify and graph common <u>functions</u> (including but not limited to linear, rational, quadratic, cubic, radical, <u>absolute value</u> ).  Graph exponential and logarithmic <u>functions</u> .  Describe and graph <u>transformations of functions</u>  Determine the <u>composition of functions</u> .  Solve problems involving <u>functions</u> and their inverses.	MA.912.A.2.6 Moderate  MA.912.A.8.3 Moderate  MA.912.A.2.10 Moderate  MA.912.A.2.8 Low  MA.912.A.2.11 High	differentiate between common functions (linear, absolute value, quadratic, cubic, radical, rational, exponential, and logarithmic)  perform transformations on common functions  perform composition of functions  find inverses of common functions when possible	<b>Relation Function Composition of Functions Inverse Functions Domain Range</b>

UNIT/ORGANIZING PRINCIPLE: Exponential and Logarithmic Functions			Pacing: 4 <sup>th</sup> 9-weeks Days 132 – 155	
Essential Question: How are inverses used to solve logarithmic or exponential equations? Can students explain the relationship between exponential and logarithmic functions?			Big Idea : Exponential and Logarithmic Functions	
Concepts/ Content	Learning Target/Skills	Benchmarks	Essential Content and Understanding	Terminology
Identify Exponential and Logarithmic Functions  Solve Problems with Exponential and Logarithmic Functions	Define exponential and logarithmic <u>functions</u> and determine their relationship  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.  Use the change of base <u>formula</u> .  Graph exponential and logarithmic <u>functions</u> .  Solve logarithmic and exponential <u>equations</u> .  Solve applications of exponential growth and decay.	MA.912.A.8.1 Moderate  MA.912.A.8.2 Low  MA.912.A.8.6 Low MA.912.A.8.3 Moderate  MA.912.A.8.5 Moderate  MA.912.A.8.7 High	use the definition of logarithm to convert between exponential and logarithmic functions  use properties of logarithms to simplify expressions and approximate values  use the change of base formula  graph exponential and logarithmic functions  solve logarithmic and exponential equations  solve real world problems using exponential growth and decay	<b>Base</b> <b>Exponent</b> Inverse function Exponential function Asymptote Exponential growth <b>Exponential decay</b> <b>Natural base e</b> <b>Common logarithm</b> <b>Natural Logarithm</b> Change of Base

<b>UNIT/ORGANIZING PRINCIPLE: Rational Expressions</b>			<b>Pacing: 4<sup>th</sup> 9-weeks Days 156 - 174</b>	
<b>Essential Question: In a rational expression and a rational equation, how is it determined which values need to be restricted from the variable solution?</b>			<b>Big Idea : Rational Expressions</b>	
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
<p>Operations on Rational Expressions</p> <p>Solve Rational Functions</p> <p>Graph Rational Functions</p>	<p>Add, subtract, multiply, and divide rational expressions.</p> <p><u>simplify complex fractions.</u></p> <p>Solve rational <u>equations.</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>Solve problems using direct, inverse, and <u>joint variations.</u></p>	<p>MA.912.A.5.2 Moderate</p> <p>MA.912.A.5.3 Moderate</p> <p>MA.912.A.5.5 Moderate</p> <p>MA.912.A.2.6 Moderate</p> <p>MA.912.A.2.12 High</p>	<p>perform operations on rational expressions</p> <p>simplify complex fractions</p> <p>solve rational equations</p> <p>graph a rational function</p> <p>use inverse and joint variation</p>	<p>Rational numbers</p> <p><b>X-intercept</b></p> <p>Direct variation</p> <p><b>Zero of a function</b></p> <p>Inverse variation</p> <p>Joint variation</p> <p>Rational function</p> <p><b>Hyperbola</b></p> <p>Complex fractions</p>

<b>UNIT/ORGANIZING PRINCIPLE: Sequences and Series</b>			<b>Pacing: 4<sup>th</sup> 9-weeks Days 175 – 180</b>	
<b><u>Essential Question:</u> How can deriving a formula for a mathematical pattern assist in gathering new data?</b>			<b>Big Idea : Sequences and Series</b>	
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
<p>Identify sequences and series</p> <p>Find specific terms in sequences</p>	<p>Define arithmetic and geometric <u>sequences</u> and <u>series</u>.</p> <p>Find specified terms of arithmetic and geometric <u>sequences</u></p>	<p>MA.912.D.11.1 Low</p> <p>MA.912.D.11.3 Low</p>	<p>need to make the connection that arithmetic sequences are linear and geometric sequences are exponential</p> <p>define arithmetic and geometric sequences and series</p> <p>define specified terms of arithmetic &amp; geometric sequences</p>	<p><b>Arithmetic sequence</b></p> <p><b>Geometric sequence</b></p> <p>Nth term</p> <p>Common difference</p> <p>Common ratio</p> <p>Explicit rule</p>

<b>UNIT/ORGANIZING PRINCIPLE: Additional Learning Strategies</b>			<b>Pacing: Throughout the course as appropriate</b>	
<b>Essential Question: Can the student evaluate the truth of a given mathematical statement?</b>			<b>Big Idea : Learning Strategies</b>	
<b>Can the student use appropriate language arts strategies to achieve success in mathematics?</b>				
<b>Concepts/ Content</b>	<b>Learning Target/Skills</b>	<b>Benchmarks</b>	<b>Essential Content and Understanding</b>	<b>Terminology</b>
N/A	<p>Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic <u>expressions</u>, <u>equations</u>, or inequalities, rational or <u>radical expressions</u>, or logarithmic or <u>exponential functions</u>.)</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>	<p>MA.912.A.10.3 High</p> <p>LA.910.1.6.1</p> <p>LA.910.4.2.1</p>	<p>Decide whether a given statement is always, sometimes or never true using functions covered throughout the course.</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