



ALGEBRA II/TRIGONOMETRY

CURRICULUM GUIDE

Loudoun County Public Schools

2010-2011

Complete scope, sequence, pacing and resources are available on the CD and will be available on the LCPS Intranet.

INTRODUCTION TO LOUDOUN COUNTY'S MATHEMATICS CURRICULUM GUIDE

This CURRICULUM GUIDE is a merger of the Virginia Standards of Learning (SOL) and the Mathematics Achievement Standards for Loudoun County Public Schools. The CURRICULUM GUIDE includes excerpts from documents published by the Virginia Department of Education. Other statements, such as suggestions on the incorporation of technology and essential questions, represent the professional consensus of Loudoun's teachers concerning the implementation of these standards. In many instances the local expectations for achievement exceed state requirements. The GUIDE is the lead document for planning, assessment and curriculum work. It is a summarized reference to the entire program that remains relatively unchanged over several student generations. Other documents, called RESOURCES, are updated more frequently. These are published separately but teachers can combine them with the GUIDE for ease in lesson planning.

Mathematics Internet Safety Procedures

1. Teachers should review all Internet sites and links prior to using it in the classroom. During this review, teachers need to ensure the appropriateness of the content on the site, checking for broken links, and paying attention to any inappropriate pop-ups or solicitation of information.
2. Teachers should circulate throughout the classroom while students are on the internet checking to make sure the students are on the appropriate site and are not minimizing other inappropriate sites. Teachers should periodically check and update any web addresses that they have on their LCPS web pages.
3. Teachers should assure that the use of websites correlate with the objectives of lesson and provide students with the appropriate challenge.
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Algebra II Nine Weeks Overview

1 st Quarter begins September 7	2 nd Quarter begins November 3	3 rd Quarter begins January 31	4 th Quarter begins April 11
AII/T.4 AII/T.9 AII/T.7 AII/T.13 (2001 SOL) AII/T.11 (2001 SOL) AII/T.4 AII/T.6 AII/T.8 38 days	AII/T.3 AII/T.4 AII/T.6 AII/T.7 AII/T.8 AII/T.2 AII/T.18 47 days	AII/T.4 AII/T.6 AII/T.7 AII/T.8 AII/T.10 AII/T.2 AII/T.9 AII/T.11 AII/T.12 47 days	AII/T.13 AII/T.14 AII/T.7 15 AII/T.16 AII/T.18 AII/T.19 AII/T.17 AII/T.20 AII/T.21 44 days

Number of Blocks	Topic and Essential Questions	Standard(s) of Learning Essential Knowledge and Skills Essential Understandings	Additional Instructional Resources/Comments
Quarter 1:	<p>Review of Algebra 1</p> <ul style="list-style-type: none"> • Equations and Inequalities • Absolute Value Graphs and Equations (in one variable) • Relations and Functions • Slopes as a Rate of Change • Linear Equations 		<p>Emphasize point-slope form of a linear equation</p> <p>Revisit the concept of parallel, perpendicular, vertical, horizontal lines</p>
	<ul style="list-style-type: none"> • Line of Best Fit • Piecewise and Step Functions <ul style="list-style-type: none"> ○ Evaluate, graph and write the equation • Absolute Value (in two variables) Equations and Inequalities 	<p>AII/T.4 AII/T.9 AII/T.7</p>	<p>Use absolute value graphs as the first in a series of (h, k) transformations</p> <p>Start discussing domain and range with the piecewise and step functions.</p> <p>Set Builder Notation and Interval Notation (see precalculus book appendix A.8)</p>

Number of Days	Topic and Essential Questions	Standard(s) of Learning Essential Knowledge and Skills Essential Understandings	Additional Instructional Resources/Comments
	<p><i>Solve Linear Systems</i></p> <ul style="list-style-type: none"> • Graphing and Algebraic Methods • Linear Programming graph feasible region and evaluate objective function <p><i>Matrix Operations</i></p> <ul style="list-style-type: none"> • <i>Systems of 2 and 3 variables with matrices</i> (2001 SOL) 	<p><i>AII/T.13</i> (2001 SOL) <i>AII/T.11</i> (2001 SOL)</p>	
	<p>Quadratic functions, equations, and inequalities</p> <ul style="list-style-type: none"> • Standard, Vertex, & Intercept Form • Factoring • Quadratic Formula (discriminant) • Solving • Inequality • Modeling 	<p>AII/T.4 AII/T.6 AII/T.7 AII/T.8</p>	<p>Solve by graphing, factoring, by square roots, completing the square, and the quadratic formula</p> <p>Interchanging the vocabulary of zeros, roots, x-intercepts, and solutions.</p> <p>Review increasing and decreasing intervals, maximum and minimum values, set and interval notation and domain and range</p>

Number of Days	Topic and Essential Questions	Standard(s) of Learning Essential Knowledge and Skills Essential Understandings	Additional Instructional Resources/Comments
Quarter 2:	Complex Numbers Verify field properties for complex numbers in a + bi format	AII/T.3	
	Polynomial functions <ul style="list-style-type: none"> • Properties of Exponents • Graphs of Polynomials • End behavior • Operations with Polynomials • Remainder and Factor Theorem • Fundamental Theorem of Algebra • Modeling 	AII/T.4 AII/T.6 AII/T.7 AII/T.8	Operations include addition, subtraction, multiplication, synthetic and long division Extension Activity Pascal Triangle /binomial expansion Revisit maximum/minimum, increasing/decreasing Emphasize the relationship between factors and zeros
	Rational Exponents <ul style="list-style-type: none"> • Properties Radical Functions <ul style="list-style-type: none"> • Solving Equations • Graphing and transformations Composition of Functions <ul style="list-style-type: none"> • Inverse functions • Domain and Range 	AII/T.2 AII/T.3 AII/T.4 AII/T.6 AII/T.7 AII/T.8	Revisit domain and range for radical functions Discuss extraneous solutions Use both notations: $f \circ g = f(g(x))$

	<p>Conic Sections</p> <ul style="list-style-type: none"> • Identify graphs and equation • Write in general and standard form • Solve quadratic systems 	<p>AII.T18</p>	<p>**This section will be removed in 2009 standards (2011 –2012 school year)</p> <p>Revisit completing the square</p>
	<p>Assessment, Enrichment, and Remediation</p>		

Number of Blocks	Topic and Essential Questions	Standard(s) of Learning Essential Knowledge and Skills Essential Understandings	Additional Instructional Resources/Comments
Quarter 3:	<p>Direct, Inverse and Joint Variation</p> <p>Rational Functions</p> <ul style="list-style-type: none"> • Graphing • Vertical, Horizontal and Slant/Oblique Asymptotes • Domain and Range <p>Rational Expressions</p> <ul style="list-style-type: none"> • Operations • Solving Rational Equations 	<p>AII/T.4 AII/T.6 AII/T.7 AII/T.8 AII/T.10</p>	<p>Operations include: addition, subtraction, multiplication, division and complex fractions</p>
	<p>Sequences and Series</p> <ul style="list-style-type: none"> • Arithmetic • Geometric • Infinite 	<p>AII.T.2</p>	<p>**Consider joint assessment of conics and sequences and series</p>
	<p>Probability</p> <ul style="list-style-type: none"> • Permutations • Combinations <p>Statistics</p> <ul style="list-style-type: none"> • Normal distribution • Area under a standard curve 	<p>AII/T.9 AII/T.11 AII/T.12</p>	<p>Questions will be field tested in 2010-2011. This will be a tested SOL in 2011-2012.</p>

	<p>Exponential Expressions, Equations and Functions</p> <ul style="list-style-type: none"> • Growth, Decay, e • Graphing with transformations • Simplifying expressions involving e • Solve • Modeling <p>Logarithmic Expressions, Equations and Functions</p> <ul style="list-style-type: none"> • Graphing with transformation • Common and Natural • Properties of Logs, Condense and Expand, Change of Base formula • Solve • Modeling 	<p>AII/T.4 AII/T.6 AII/T.7 AII/T.8</p>	<p>Revisit best-fit and exponential regression</p> <p>Express logarithmic functions as the inverse of exponential functions.</p> <p>Revisit domain and range</p> <p>Include extraneous solutions</p> <p>Use \ln to solve exponential equations. AP very rarely tests bases other than e.</p>
	<p>Assessment, Enrichment, and Remediation</p>		

Number of Blocks	Topic and Essential Questions	Standard(s) of Learning Essential Knowledge and Skills Essential Understandings	Additional Instructional Resources/Comments
Quarter 4:	Allow time for SOL preparation and testing and for final examinations		
	<p>Trigonometry</p> <p>Evaluate the six trig functions of an angle in standard position given a point on the coordinate plane.</p> <p>Develop the unit circle using degrees and radians.</p> <p>Solve basic trig equations using the unit circle coordinates and use calculator to determine “non-special” angles</p> <p>Connect right triangle trig to (x, y) on the unit circle.</p>	<p>AII/T.13 AII/T.14 AII/T.15 AII/T.16</p>	<p>Include discussion of coterminal angles, reference angles, positive and negative angles</p> <p>Ex: $\sin \theta = \frac{1}{2}$ without a calculator</p> <p>$\csc \theta = 1.2345$ with a calculator</p>
	Graph the six trigonometric functions	<p>AII/T.18 AII/T.19</p>	<p>Stress the parent functions, but address transformations</p> <p>$y = A \sin B(x - C) + D$</p>

	<p>Develop the trigonometric identities</p> <ul style="list-style-type: none"> • Pythagorean Identities • Reciprocal • Quotient • Co-function • Even and Odd functions <p>Solve trigonometric equations using identities</p>	<p>AII/T.17 AII/T.18 AII/T.20</p>	<p>Include equations that may or may not be factorable. Use a calculator for non-unit circle values.</p>
	<p>Trigonometric Applications</p>	<p>AII/T.21</p>	
	<p>Assessment, Enrichment, and Remediation</p>		