LEE ACADEMY

Lee, Maine USA

Official Curriculum

Honors Algebra I

Rev. Summer 2011

Course description:

In *Algebra I,* students learn to represent families of functions in various ways: as verbal descriptions, equations tables, and graphs. They also learn to model real-world situations using functions in order to solve problems which arise from those situations. Particular emphasis is placed on linear and quadratic functions. Lessons on geometry, probability and data analysis are also part of this course, linking the course to other areas of math and helping prepare students for major assessments and standardized tests. Assessments are done in a variety of formats: multiple choice, short response, extended response, and major situation-based applications.

Primary text(s) and other major resources:

Algebra I Larson, Boswell, Kanold, Stiff
(MacDougal Littell, 2007)

Unit Length & MLRs	Objectives	Essential Concepts & Questions	Assessment
Unit 1 Using Equations in One Variable—6 weeks <u>Goal set 1:</u> ✓ Write and evaluate algebraic expressions. **D11a** ✓ Use expressions to write equations and inequalities. **D11b** ✓ Represent functions as verbal rules, equations, tables, and graphs. **D12a**	<u>For set 1:</u> Student will: ✓ Evaluate algebraic expressions and use exponents ✓ Apply order of operations to evaluate expressions ✓ Translate verbal phrases into expressions ✓ Translate verbal sentences into equations and inequalities ✓ Use a problem solving plan to solve problems ✓ Represent functions as rules and tables ✓ Represent functions as graphs ✓ Develop skill with algebraic calculator functions	<u>For set 1:</u> Use multiple representations to describe a real-world situation, such as determining a route where someone might run/jog	<u>For set 1:</u> ✓ Mixed review ✓ Use cumulative review & word problems at end of chapter
<u>Goal set 2:</u> ✓ Perform operations with real numbers. **A1** ✓ Apply properties of real numbers. **A1** ✓ Classify and reason with real numbers. **A1**	<u>Objective set 2:</u> Student will: ✓ Graph and compare positive and negative numbers ✓ Add, subtract, multiply and divide positive and negative numbers ✓ Apply the distributive property ✓ Find square roots and compare real numbers	<u>EC for set 2:</u> ✓ How can square roots be used for measuring square, rectangular, and right trianglular objects? How do these square root numbers fit in with other numbers? ✓ How can we use proportions and equations to help predict future population distribution of various locations? Also, how does this relate to the military presence and prison crowding of a location?	<u>For set 2:</u> Square Roots Project
<u>Goal set 3:</u> ✓ Solve equations in one variable. **D13a** ✓ Solve proportions and percent problems. ✓ Rewrite equations in two or more variables. **D13**	<u>For set 3:</u> Student will: ✓ Solve one-step equations ✓ Solve two-step equations ✓ Solve multi-step equations ✓ Find ratios and write and solve proportions ✓ Solve proportions using cross products		<u>For set 3:</u> Proportions of Populations Activity

Unit 2 Using Equations in Two Variables—10 weeks <u>Goal set 4:</u> ✓ Graph linear equations and functions using a variety of methods. **D12** ✓ Understand how changes in linear equations and functions affect graphs. **D13a** ✓ Use graphs of linear equations and functions to solve real problems. **D**	<u>For set 4:</u> Student will: ✓ Plot points in a coordinate plane ✓ Graph linear equations in a coordinate plane ✓ Graph a linear equation using intercepts ✓ Find slope of a line and interpret slope as a rate of change ✓ Graph linear equations using slope-intercept form ✓ Write and graph direct variation equations	<u>For set 4:</u> How are linear functions used to solve problems involving distance?	<u>For set 4:</u> Direct Variation & Trees Project
<u>Goal set 5:</u> ✓ Write linear equations in a variety of forms. **D** ✓ Use linear models to solve problems. **D13d** ✓ Model data with a line of fit. **B3b**	<u>For set 5:</u> Student will: ✓ Write equations of lines ✓ Write equations of lines using points ✓ Write linear equations in point-slope form ✓ Write linear equations in standard form ✓ Write equations of parallel and perpendicular lines ✓ Make scatter plots and write equations to model data ✓ Make predictions using best-fitting line	<u>For set 5:</u> How are linear equations applied to solve problems involving a constant rate of change?	<u>For set 5:</u> Write linear equations in 3 forms.
<u>Goal set 6:</u> ✓ Apply properties of inequalities. **D13** ✓ Use statements with *and* or *or*. ✓ Graph inequalities. **D13a**	<u>For set 6:</u> Student will: ✓ Solve inequalities using addition, subtraction, multiplication and division ✓ Solve multi-step inequalities ✓ Solve compound inequalities ✓ Solve absolute value equations ✓ Solve absolute value inequalities ✓ Graph linear inequalities in two variables	<u>For set 6:</u> How are inequalities used to solve problems in sound amplification and bodily functions?	
<u>Goal set 7:</u> ✓ Solve linear systems by	<u>For set 7:</u> Student will: ✓ Graph and solve systems of linear	<u>For set 7:</u> How can we use systems of equations to make better financial choices? When do different	<u>For set 7:</u> Season & Individual Passes Project

graphing. **13a** ✓ Solve linear systems using algebra. **D13a** ✓ Solve systems of linear inequalities. **13a**	equations ✓ Solve systems of linear equations by substitution ✓ Solve linear systems using adding or subtracting ✓ Solve linear systems by multiplying first ✓ Determine the number of solutions of a linear system	pricing plans coincide, and what Algebra techniques can we use to obtain that information?	
Unit 3 Exponential and Quadratic Functions—10 weeks <u>Goal set 8:</u> ✓ Apply properties of exponents to simplify expressions. **A1b** ✓ Use numbers in scientific notation. **A1c** ✓ Write and graph exponential functions. **D12a**	<u>For set 8:</u> Student will: ✓ Apply exponent properties involving products ✓ Apply exponent properties involving quotients ✓ Use zero and negative exponents ✓ Use scientific notation ✓ Write and graph exponential growth models ✓ Write and graph exponential decay functions	<u>For set 8:</u> How does exponential growth relate to living things? Can studying the past help predict the percentage of population growth of various locations?	<u>For set 8:</u> Population Growth Project
<u>Goal set 9:</u> ✓ Add, subtract and multiply polynomials. **D11b** ✓ Factor polynomials. **D11b** ✓ Write and solve polynomial equations to solve problems. **D11**	<u>For set 9a:</u> Student will: ✓ Add, subtract and multiply polynomials ✓ Use special product patterns to multiply polynomials ✓ Solve polynomial equations <u>Objective set 9b:</u> Student will: ✓ Factor trinomials of the form $x^2 + bx + c$ ✓ Factor trinomials of the form $ax^2 + bx + c$ ✓ Factor special products ✓ Factor polynomials completely	<u>For set 9a:</u> How are polynomial functions used to model business and physics applications?	<u>For set 9a:</u> Solve polynomial equations in factored form. <u>For set 9b:</u> Factor polynomials completely.
<u>Goal set 10:</u> ✓ Graph quadratic equations. **D13b** ✓ Solve quadratic equations. **D13b**	<u>For set 10:</u> Student will: ✓ Solve quadratic equations by graphing ✓ Solve quadratic equations by finding square roots	<u>For set 10:</u> ✓ How is the quadratic model used in physics?	<u>For set 10:</u> ✓ Solve quadratic equations by various methods. ✓ Use book test for chapter 10, p701

✓ Compare linear, exponential and quadratic models. **D13**	✓ Solve quadratic equations by completing the square ✓ Solve quadratic equations using the quadratic formula		
Unit 4 Radical and Rational Functions—9 weeks <u>Goal set 11:</u> ✓ Graph square root functions. **A1a** ✓ Use properties of radicals in expressions and equations. ✓ Apply knowledge of radicals in geometry.	<u>For set 11:</u> Student will: ✓ Simplify radical expressions ✓ Solve radical equations	<u>For set 11:</u> How are radical equations used to solve real-world problems such as the length of a sailboat's water line, given the hull speed.	<u>For set 11:</u> ✓ Solve radical equations. ✓ LAD Assessment: *Buying a Jet Ski*