



Alignment Document
State of Indiana and Aventa Learning Algebra I

Algebra I
2005-2007 Benchmark Blueprint

Standards	Benchmarks	Unit Name	Course Topic Description
A1.1 Students simplify and compare expressions. They use rational exponents and simplify square roots.	A1.1.1 Compare real number expressions.		
	A1.1.2 Simplify square roots using factors.	Variables and Expressions	Roots
		Polynomials	Factoring with the GCF
	A1.1.3 Understand and use the distributive, associative, and commutative properties.	Variables and Expressions	The Associative Property
		Variables and Expressions	The Commutative Property
		Variables and Expressions	The Distributive Property
		Real Numbers	Writing and Justifying Steps Using Properties
		Real Numbers	Division of Rational Numbers
	A1.1.4 Use the laws of exponents for rational exponents.	Real Numbers	Evaluating Division Expressions
		Variables and Expressions	Fractional Exponents
Variables and Expressions		Problem Solving using Exponents and Roots	
A1.1.5 Use dimensional (unit) analysis to organize conversions and computations.	Variables and Expressions	Expressions with Powers	
A1.2 Students solve linear equations and inequalities in one variable. They solve word	A1.2.1 Solve linear equations.	Functions and Linear Equations	Slope-Intercept Form



<p>problems that involve linear equations, inequalities, or formulas.</p>		<p>Functions and Linear Equations</p> <p>Functions and Linear Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p>	<p>Linear Patterns</p> <p>Writing Linear Equations</p> <p>Formulas as Equations</p> <p>Parentheses in Equations</p> <p>Addition and Subtraction in Equations</p> <p>Solving Multi-Step Equations</p> <p>Solving Problems</p> <p>Mixture Problems</p> <p>Multiplication and Division in Equations</p> <p>Equations with Variables on Each Side</p>
	<p>A1.2.2 Solve equations and formulas for a specified variable.</p>	<p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p>	<p>Formulas as Equations</p> <p>Multiplication and Division in Equations</p> <p>Equations with Variables on Each Side</p> <p>Addition and Subtraction in Equations</p> <p>Mixture Problems</p> <p>Solving Multi-Step Equations</p> <p>Distance Formula</p> <p>Solving Problems</p>



	Polynomials Quadratics and Radicals Exponentials Variables and Expressions Variables and Expressions	Solving Equations Using Factoring Solving by Using Square Roots Exponential Equations Algebraic Expressions Expressions with Powers
A1.2.3 Find solution sets of linear inequalities when possible numbers are given for the variable.	Inequalities Inequalities Inequalities	Inequalities in Two Variables Solving Inequalities Using Multiplication and Division Graphing Inequalities in Two Variables
A1.2.4 Solve linear inequalities using properties of order.	Inequalities Inequalities Inequalities Inequalities Inequalities Inequalities	Multi-Step Inequalities Compound Inequalities Solving Inequalities by Addition and Subtraction Solving Inequalities Using Multiplication and Division Inequalities in Two Variables Graphing Inequalities in Two Variables
A1.2.5 Solve combined linear inequalities.	Inequalities Inequalities Inequalities Inequalities Inequalities	Multi-Step Inequalities Inequalities in Two Variables Solving Inequalities Using Multiplication and Division Solving Inequalities by Addition and Subtraction Compound Inequalities

		Inequalities	Graphing Inequalities in Two Variables
	A1.2.6 Solve word problems that involve linear equations, formulas, and inequalities.		
A1.3 Students sketch and interpret graphs representing given situations. They understand the concept of a function and analyze the graphs of functions.	A1.3.1 Sketch a reasonable graph for a given relationship.	Functions and Linear Equations	Graphing an Equation Using Intercepts
		Solving Systems	Review of Graphing Linear Equations
		Functions and Linear Equations	Graphing an Equation Using Points
		Functions and Linear Equations	The Coordinate System
		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
	A1.3.2 Interpret a graph representing a given situation.	Solving Systems	Histograms
		Solving Systems	Analyzing Statistical Data
A1.3.3 Understand the concept of a function, decide if a given relation is a function, and link equations to functions.		Functions and Linear Equations	Relations
		Functions and Linear Equations	Functions
		Functions and Linear Equations	Graphs of Inverses
		Equations	Parentheses in Equations
		Equations	Multiplication and Division in Equations
		Equations	Mixture Problems
	Equations	Solving Multi-Step Equations	

		Equations Equations Equations Equations Equations Exponentials	Equations with Variables on Each Side Rate Problems Solving Problems Distance Formula Equations and Problem Solving Exponential Equations
	A1.3.4 Find the domain and range of a relation.	Functions and Linear Equations Functions and Linear Equations	Relations Graphs of Inverses
A1.4 Students graph linear equations and inequalities in two variables. They write equations of lines and find and use the slope and y-intercept of lines. They use linear equations to model real data.	A1.4.1 Graph a linear equation.	Equations Equations Equations Equations Equations Solving Systems Functions and Linear Equations Functions and Linear Equations	Rate Problems Solving Problems Mixture Problems Multiplication and Division in Equations Equations with Variables on Each Side Parentheses in Equations Review of Graphing Linear Equations Graphing an Equation Using Points Writing Linear Equations

		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Slope-Intercept Form
		Functions and Linear Equations	Graphing an Equation Using Intercepts
		Quadratics and Radicals	Graphing Quadratic Functions
	A1.4.2 Find the slope, x-intercept and y-intercept of a line given its graph, its equation, or two points on the line.	Functions and Linear Equations	Graphing an Equation Using Intercepts
		Functions and Linear Equations	More about Slope
		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
	A1.4.3 Write the equation of a line in slope-intercept form. Understand how the slope and y-intercept of the graph are related to the equation.	Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		Functions and Linear Equations	Forms of Non-Vertical Linear Equations
		Functions and Linear Equations	Graphing an Equation Using Intercepts
		Functions and Linear Equations	Slope-Intercept Form
		Functions and Linear Equations	More about Slope
		Solving Systems	Review of Writing Linear Equations

	A1.4.4 Write the equation of a line given appropriate information.		
	A1.4.5 Write the equation of a line that models a data set and use the equation (or the graph of the equation) to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.	Functions and Linear Equations	More about Slope
	A1.4.6 Graph a linear inequality in two variables.	Solving Systems Inequalities Inequalities Inequalities	Review of Graphing Inequalities Graphing Inequalities in Two Variables Solving Inequalities Using Multiplication and Division Inequalities in Two Variables
A1.5 Students solve pairs of linear equations using graphs and using algebra. They solve pairs of linear inequalities using graphs. They solve word problems involving pairs of linear equations.	A1.5.1 Use a graph to estimate the solution of a pair of linear equations in two variables.	Real Numbers Real Numbers Functions and Linear Equations Functions and Linear Equations Functions and Linear Equations Functions and Linear Equations Solving Systems	Estimation with Real Numbers Estimation Graphing an Equation Using Slope and Y-Intercept Graphing an Equation Using Intercepts Graphing an Equation Using Points Slope-Intercept Form Review of Graphing Linear Equations
	A1.5.2 Use a graph to find the solution set of a pair of linear inequalities in two variables.	Inequalities	Solving Inequalities Using Multiplication and Division

		Solving Systems	Graphing Systems of Inequalities
	A1.5.3 Understand and use the substitution method to solve a pair of linear equations in two variables.	Functions and Linear Equations	Replacement Sets and Variables
	A1.5.4 Understand and use the addition or subtraction method to solve a pair of linear equations in two variables.	Solving Systems	Elimination and Multiplication
	A1.5.5 Understand and use multiplication with the addition or subtraction method to solve a pair of linear equations in two variables.	Solving Systems	Elimination and Multiplication
	A1.5.6 Use pairs of linear equations to solve word problems.	Functions and Linear Equations Functions and Linear Equations Functions and Linear Equations Equations Equations Equations Equations Equations Equations Equations Equations	Linear Patterns Writing Linear Equations Slope-Intercept Form Parentheses in Equations Multiplication and Division in Equations Equations with Variables on Each Side Addition and Subtraction in Equations Mixture Problems Solving Multi-Step Equations Formulas as Equations Solving Problems
A1.6 Students add, subtract, multiply, and divide polynomials.	A1.6.1 Add and subtract polynomials.	Polynomials	Addition and Subtraction of Polynomials
	A1.6.2 Multiply and divide monomials.	Variables and Expressions	Multiplying Monomials



They factor quadratics.		Variables and Expressions	Dividing Monomials
		Polynomials	Multiplying Monomials Review
	A1.6.3 Find powers and roots of monomials (only when the answer has an integer exponent).	Variables and Expressions	Multiplying Monomials
		Variables and Expressions	Expressions with Powers
		Variables and Expressions	Fractional Exponents
		Variables and Expressions	Roots
		Variables and Expressions	Problem Solving using Exponents and Roots
		Variables and Expressions	Exponents
		Variables and Expressions	Dividing Monomials
		Polynomials	Multiplying Monomials Review
	Exponentials	Exponential Equations	
	A1.6.4 Multiply polynomials.	Polynomials	Multiplying Using FOIL
		Polynomials	Multiplying Polynomials
		Polynomials	Special Products
		Polynomials	Multiplying Polynomials by a Monomial
Variables and Expressions		Multiplying Monomials	
A1.6.5 Divide polynomials by monomials.	Variables and Expressions	Dividing Monomials	
A1.6.6 Find a common monomial factor in a polynomial.	Polynomials	Difference of Two Squares	
	Polynomials	Factoring Perfect Square Trinomials	
	Polynomials	Factoring Simple Trinomials	



		Polynomials	Factoring with the GCF
		Polynomials	Factoring Other Trinomials
	A1.6.7 Factor the difference of two squares and other quadratics.	Quadratics and Radicals	Solving Quadratic Equations with Graphs
		Quadratics and Radicals	The Quadratic Formula
		Quadratics and Radicals	Graphing Quadratics
		Quadratics and Radicals	Completing the Square
		Quadratics and Radicals	Graphing Quadratic Functions
		Quadratics and Radicals	Solving by Using Square Roots
		Polynomials	Solving Equations by Factoring Trinomials
		Polynomials	Difference of Two Squares
		Polynomials	Factoring Other Trinomials
	A1.6.8 Understand and describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression.	Equations	Equations with Variables on Each Side
		Equations	Multiplication and Division in Equations
		Equations	Mixture Problems
		Equations	Parentheses in Equations
		Equations	Rate Problems
		Equations	Solving Multi-Step Equations
		Equations	Distance Formula
		Equations	Solving Problems



		Equations	Equations and Problem Solving
		Polynomials	Factoring Perfect Square Trinomials
		Polynomials	Difference of Two Squares
		Polynomials	Factoring Other Trinomials
		Polynomials	Factoring Simple Trinomials
		Polynomials	Factoring with the GCF
		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		Functions and Linear Equations	Graphing an Equation Using Intercepts
		Exponentials	Exponential Equations
A1.7 Students simplify algebraic ratios and solve algebraic proportions.	A1.7.1 Simplify algebraic ratios.	Equations	Problems with Proportions
		Equations	Ratios and Proportions
	A1.7.2 Solve algebraic proportions.		
A1.8 Students graph and solve quadratic and radical equations. They graph cubic equations.	A1.8.1 Graph quadratic, cubic, and radical equations.	Quadratics and Radicals	Completing the Square
		Quadratics and Radicals	Graphing Quadratics
		Quadratics and Radicals	Solving Quadratic Equations with Graphs
		Quadratics and Radicals	Solving Radical Equations
		Quadratics and Radicals	Graphing Quadratic Functions
		Quadratics and Radicals	Solving by Using Square Roots
		Quadratics and Radicals	The Quadratic Formula

	Polynomials	Factoring Other Trinomials
	Polynomials	Solving Equations by Factoring Trinomials
	Solving Systems	Review of Graphing Linear Equations
	Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
	Functions and Linear Equations	Graphing an Equation Using Intercepts
	Functions and Linear Equations	Graphing an Equation Using Points
A1.8.2 Solve quadratic equations by factoring.	Polynomials	Factoring Other Trinomials
	Polynomials	Solving Equations by Factoring Trinomials
A1.8.3 Solve quadratic equations in which a perfect square equals a constant.	Quadratics and Radicals	The Quadratic Formula
	Quadratics and Radicals	Solving by Using Square Roots
	Quadratics and Radicals	Solving Quadratic Equations with Graphs
	Polynomials	Factoring Other Trinomials
	Polynomials	Solving Equations by Factoring Trinomials
A1.8.4 Complete the square to solve quadratic equations.	Quadratics and Radicals	Completing the Square
A1.8.5 Derive the quadratic formula by completing the square.	Quadratics and Radicals	Completing the Square
	Quadratics and Radicals	The Quadratic Formula
A1.8.6 Solve quadratic equations by using the quadratic formula.	Quadratics and Radicals	The Quadratic Formula
A1.8.7 Use quadratic equations to solve word problems.	Polynomials	Factoring Other Trinomials



		Polynomials	Solving Equations by Factoring Trinomials
		Quadratics and Radicals	The Quadratic Formula
		Quadratics and Radicals	Graphing Quadratics
		Quadratics and Radicals	Completing the Square
		Quadratics and Radicals	Graphing Quadratic Functions
		Quadratics and Radicals	Solving by Using Square Roots
		Quadratics and Radicals	Solving Quadratic Equations with Graphs
	A1.8.8 Solve equations that contain radical expressions.	Equations	Addition and Subtraction in Equations
		Equations	Mixture Problems
		Equations	Solving Problems
		Equations	Formulas as Equations
		Equations	Multiplication and Division in Equations
		Equations	Solving Multi-Step Equations
		Equations	Equations with Variables on Each Side
		Quadratics and Radicals	Adding and Subtracting Radical
		Quadratics and Radicals	Simplifying Radicals Containing Fractions
		Quadratics and Radicals	Simplifying Radicals
		Quadratics and Radicals	Simplifying Radicals with Variables
		Quadratics and Radicals	Solving by Using Square Roots

		Quadratics and Radicals Polynomials Exponentials	Multiplying Radical Expressions Solving Equations Using Factoring Exponential Equations
	A1.8.9 Use graphing technology to find approximate solutions of quadratic and cubic equations.	Quadratics and Radicals Quadratics and Radicals Quadratics and Radicals Quadratics and Radicals Quadratics and Radicals Quadratics and Radicals Polynomials Polynomials	Completing the Square Graphing Quadratic Functions Solving by Using Square Roots Solving Quadratic Equations with Graphs The Quadratic Formula Graphing Quadratics Factoring Other Trinomials Solving Equations by Factoring Trinomials
A1.9 Mathematical Reasoning and Problem Solving	A1.9.1 Use a variety of problem solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.	Solving Systems Functions and Linear Equations Functions and Linear Equations Quadratics and Radicals	Review of Graphing Linear Equations Graphing an Equation Using Points The Coordinate System Solving Quadratic Equations with Graphs
		Equations	Equations with Variables on Each Side
	A1.9.2 Decide whether a solution is reasonable in the context of the original situation.	Equations	Mixture Problems
	A1.9.3 Use the properties of the real number system and the order of operations to justify the steps of simplifying functions and solving equations.	Equations	Solving Problems



	Equations	Formulas as Equations
	Equations	Multiplication and Division in Equations
	Equations	Equations with Variables on Each Side
	Equations	Addition and Subtraction in Equations
	Equations	Solving Multi-Step Equations
	Variables and Expressions	The Commutative Property
	Variables and Expressions	The Distributive Property
	Variables and Expressions	Order of Operations
	Variables and Expressions	The Associative Property
	Real Numbers	Division of Rational Numbers
	Real Numbers	Writing and Justifying Steps Using Properties
	Real Numbers	Properties of Closure and Equality
	Real Numbers	Evaluating Division Expressions
	Real Numbers	Evaluating Expressions
	Real Numbers	Using the Properties
	Quadratics and Radicals	Solving by Using Square Roots
	Exponentials	Exponential Equations
	Polynomials	Solving Equations Using Factoring
A1.9.4 Understand that the logic of equation solving begins with the assumption that the	Equations	Solving Problems

	<p>variable is a number that satisfies the equation, and that the steps taken when solving equations create new equations that have, in most cases, the same solution set as the original. Understand that similar logic applies to solving systems of equations simultaneously.</p>	<p>Equations Equations Equations Equations Equations Equations Equations Equations Solving Systems Solving Systems Solving Systems Solving Systems Solving Systems Quadratics and Radicals Polynomials Exponentials Variables and Expressions Variables and Expressions</p>	<p>Rate Problems Multiplication and Division in Equations Equations with Variables on Each Side Formulas as Equations Addition and Subtraction in Equations Mixture Problems Solving Multi-Step Equations Solving with Elimination Problem Solving with Systems Systems of equations Solving with Substitution Problem Solving Solving by Using Square Roots Solving Equations Using Factoring Exponential Equations Expressions with Powers Algebraic Expressions</p>
	<p>A1.9.5 Decide whether a given algebraic statement is true always, sometimes, or never (statements involving linear or quadratic expressions, equations, or inequalities).</p>	<p>Functions and Linear Equations Functions and Linear</p>	<p>Linear Patterns Graphing an Equation Using Slope and Y-</p>



	Equations	Intercept
	Functions and Linear Equations	Graphing an Equation Using Intercepts
	Functions and Linear Equations	Slope-Intercept Form
	Functions and Linear Equations	Writing Linear Equations
	Equations	Mixture Problems
	Equations	Multiplication and Division in Equations
	Equations	Parentheses in Equations
	Equations	Rate Problems
	Equations	Equations with Variables on Each Side
	Equations	Solving Problems
	Quadratics and Radicals	Solving by Using Square Roots
	Quadratics and Radicals	Solving Quadratic Equations with Graphs
	Quadratics and Radicals	The Quadratic Formula
	Quadratics and Radicals	Graphing Quadratics
	Quadratics and Radicals	Completing the Square
	Quadratics and Radicals	Graphing Quadratic Functions
	Polynomials	Solving Equations by Factoring Trinomials



		Polynomials	Factoring Other Trinomials
		Inequalities	Inequalities in Two Variables
		Inequalities	Graphing Inequalities in Two Variables
		Inequalities	Solving Inequalities Using Multiplication and Division
	A1.9.6 Distinguish between inductive and deductive reasoning, identifying and providing examples of each.	Variables and Expressions	Deductive Reasoning
		Variables and Expressions	Logical Reasoning
		Variables and Expressions	Inductive Reasoning
	A1.9.7 Identify the hypothesis and conclusion in a logical deduction.		
	A1.9.8 Use counterexamples to show that statements are false, recognizing that a single counterexample is sufficient to prove a general statement false.		