



# Alignment Document

## State of Wisconsin And Aventa Learning Algebra 1

### Algebra 1 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
A.12	Mathematical Processes		
A.12.1	Use reason and logic to		
A.12.1.a	evaluate information	Variables and Expressions	Evaluating Expressions
		Variables and Expressions	Integers
		Variables and Expressions	Exponents and Roots
		Variables and Expressions	Inductive and Deductive Logic
		Real Numbers	Rational and Irrational Numbers
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Equations	More Properties of Equality
A.12.1.b	perceive patterns	Functions and Linear Equations	Number Patterns
		Functions and Linear Equations	Arithmetic Sequences
		Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Direct Variation
		Quadratics and Radicals	
		Exponentials	Growth and Decay
		Exponentials	Geometric Sequences
		Rational Expressions	Inverse Variation

A.12.1.c	identify relationships	Variables and Expressions	Inductive and Deductive Logic,
		Variables and Expressions	The Commutative Property
		Variables and Expressions	The Associative Property
		Variables and Expressions	The Distributive Property
		Real Numbers	Rational and Irrational Numbers
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Equations	More Properties of Equality
		Functions and Linear Equations	Number Patterns
		Functions and Linear Equations	Arithmetic Sequences
		Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Direct Variation
		Quadratics and Radicals	
		Exponentials	Growth and Decay
		Exponentials	Geometric Sequences
		Rational Expressions	Inverse Variation
A.12.1.d	formulate questions, pose problems, and make and test conjectures	Variables and Expressions	Assignment 1 Commutative Property
		Variables and Expressions	Assignment 2 Associative Property
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Real Numbers	Discussion-Sets
A.12.1.e	pursue ideas that lead to further understanding and deeper insight	Equations	Problem Solving-Writing and Solving Equations
		Equations	Homework 3, 4, 8, 9-Writing and Solving Equations
		Inequalities Topics	Homework 3-Writing and Solving Inequalities
		Inequalities Topics	Homework 4-Writing and Solving Complex Inequalities
		Inequalities Topics	Showing Steps in Solving Inequalities

		Quadratics and Radicals	Activity 1-Graphing a Parabola
		Quadratics and Radicals	Discussion-Looking at Maximum and Minimum
		Functions and Linear Equations	Activity 1-Graphing Inverses
		Functions and Linear Equations	Activity 2-Discovering Parallel and Perpendicular Lines
		Functions and Linear Equations	Activity 3-Scatterplot Activity
		Polynomials	Activity 1-Sieve of Erastosthenes
		Polynomials	Discussion-Sharing Problems in Factoring
		Rational Expressions	Discussion-Writing an Inverse Variation Problem
		Exponentials	Discussion-Comparing Banks
		Exponentials	Activity 1-Looking at Growth in Ticket Prices
		Solving Systems	Problem Solving 1 Writing and Solving Systems
		Solving Systems	Discussion-Writing and Solving Systems
		Solving Systems	Problem Solving 2-Linear Programming
A.12.2	Communicate logical arguments and clearly show		
A.12.2.a	why a result does or does not make sense	Variables and Expressions	Inductive and Deductive Logic
		Variables and Expressions	The Commutative Property
		Variables and Expressions	The Associative Property
		Variables and Expressions	The Distributive Property
		Real Numbers	Rational and Irrational Numbers
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Equations	More Properties of Equality
A.12.2.b	why the reasoning is or is not valid	Variables and Expressions	Inductive and Deductive Logic
		Variables and Expressions	The Commutative Property
		Variables and Expressions	The Associative Property



		Variables and Expressions	The Distributive Property
		Real Numbers	Rational and Irrational Numbers
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Equations	More Properties of Equality
		Equations	Activity 1-Writing and Solving Equations
A.12.2.c	an understanding of the difference between examples that support a conjecture and a proof of the conjecture	Variables and Expressions	Inductive and Deductive Logic
		Variables and Expressions	The Commutative Property
		Variables and Expressions	The Associative Property
		Variables and Expressions	The Distributive Property
A.12.3	Analyze non-routine problems and arrive at solutions by various means, including models and simulations, often starting with provisional conjectures and progressing, directly or indirectly, to a solution, justification, or counter-example	Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
		Equations	Activity 1-Writing and Solving Equations
		Solving Systems	Problem Solving2-Linear Programming
A.12.4	Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data	Solving Systems	Problem Solving2-Linear Programming
		Equations	
		Variables and Expressions	Inductive and Deductive Logic
		Variables and Expressions	The Commutative Property



		Variables and Expressions	The Associative Property
		Variables and Expressions	The Distributive Property
		Real Numbers	Writing and Justifying Steps Using Properties
A.12.5	Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly	Equations	Problem Solving-Writing and Solving Equations
		Equations	Homework 3, 4, 8, 9-Writing and Solving Equations
		Inequalities	Homework 3-Writing and Solving Inequalities
		Inequalities	Homework 4-Writing and Solving Complex Inequalities
		Inequalities	Showing Steps in Solving Inequalities
		Quadratics and Radicals	Activity 1-Graphing a Parabola
		Quadratics and Radicals	Discussion-Looking at Maximum and Minimum
		Functions and Linear Equations	Activity 1-Graphing Inverses
		Functions and Linear Equations	Activity 2-Discovering Parallel and Perpendicular Lines
		Functions and Linear Equations	Activity 3-Scatterplot Activity
		Polynomials	Activity 1-Sieve of Erastosthenes
		Polynomials	Discussion-Sharing Problems in Factoring
		Rational Expressions	Discussion-Writing an Inverse Variation Problem
		Exponentials	Discussion-Comparing Banks
		Exponentials	Activity 1-Looking at Growth in Ticket Prices
		Solving Systems	Problem Solving 1 Writing and Solving Systems
		Solving Systems	Discussion-Writing and Solving Systems
		Solving Systems	Problem Solving2-Linear Programming
		Variables and Expressions	Assignment 1-Commutative Property
		Variables and Expressions	Assignment 2-Associative Property

		Variables and Expressions	Discussion-Finding Volumes
		Real Numbers	Discussion-Sets
		Real Numbers	Assignment 3-Justifying Steps
A.12.6	Read and understand		
A.12.6.a	mathematical texts and other instructional materials	All Units	All Topics
A.12.6.b	writing about mathematics (e.g., articles in journals)	Variables and Expressions	Discussion-Finding Volumes
		Real Numbers	Discussion-Finding Sets
		Solving Systems	Discussion-Writing and Solving Systems
		Polynomials	Discussion-Sharing Problems in Factoring
		Rational Expressions	Discussion-Writing an Inverse Variation
		Exponentials	Discussion-Comparing Banks
		Quadratics and Radicals	Discussion-Looking at Maximum and Minimum
0	mathematical ideas as they are used in other contexts		
B.12	Number Operations and Relationships		
B.12.1	Use complex counting procedures such as union and intersection of sets and arrangements (permutations and combinations) to solve problems	Rational Expressions	Probability
		Inequalities	Compound Inequalities
		Inequalities	Absolute Value Inequalities
B.12.2	Compare real numbers using		
B.12.2.a	order relations ( $>$ , $<$ ) and transitivity	Real Numbers	Rational and Irrational Numbers
B.12.2.b	ordinal scales including logarithmic (e.g., Richter, pH rating)	Polynomials	Scientific Notation
B.12.2.c	arithmetic differences	Functions and Linear Equations	Arithmetic Sequences
B.12.2.d	ratios, proportions, percents, rates of change	Equations	Proportions and Percent
		Functions and Linear Equations	Writing Linear Equations
		Functions and Linear Equations	More About Slope

B.12.3	Perform and explain operations on real numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)	Variables and Expressions	Evaluating Expressions
		Variables and Expressions	Integers
		Variables and Expressions	Exponents and Roots
		Real Numbers	Addition and Subtraction of Real Numbers
		Real Numbers	Multiplication and Division of Real Numbers
		Real Numbers	Absolute Value
		Real Numbers	Estimation and Problem Solving
		Quadratics and Radicals	Operations on Radicals
		Rational Expressions	Multiplying and Dividing Rational Expressions
		Rational Expressions	Adding and Subtracting Rational Expressions
B.12.4	In problem-solving situations involving the application of different number systems (natural, integers, rational, real) select and use appropriate		
B.12.4.a	computational procedures	Equations	Equations
		Equations	Multi-Step Problems
		Equations	Proportions and Percent
		Equations	Formulas and Absolute Value
		Equations	Problem Solving
		Inequalities	Simple Inequalities
		Inequalities	Multi-Step and Compound Inequalities
		Inequalities	Absolute Value Inequalities
		Polynomials	Solving Equations by Factoring
		Quadratics and Radicals	Solving Quadratics by Factoring
		Quadratics and Radicals	Solving Quadratics by Square Root
		Quadratics and Radicals	Solving Quadratics by Completing the Square
		Quadratics and Radicals	Solving Quadratics with the Quadratic Formula

		Quadratics and Radicals	Solving Radical Equations
		Rational Expressions	Solving Rational Equations
B.12.4.b	properties (e.g., commutativity, associativity, inverses)	Variables and Expressions	The Commutative Property
		Variables and Expressions	The Associative Property
		Variables and Expressions	The Distributive Property
		Variables and Expressions	Integers (inverses, identities)
		Real Numbers	Closure and Properties of Equality
		Equations	More Properties of Equality
B.12.4.c	modes of representation (e.g., rationals as repeating decimals, indicated roots as fractional exponents)	Real Numbers	Rational Numbers and Order of Numbers
		Variables and Expressions	Exponents and Roots
		Quadratics and Radicals	Radicals
B.12.5	Create and critically evaluate numerical arguments presented in a variety of classroom and real-world situations (e.g., political, economic, scientific, social)	Variables and Expressions	Activity 1-Commutative Property
		Variables and Expressions	Activity 2-Associative Property
		Variables and Expressions	Discussion-Finding Volumes
		Real Numbers	Estimation and Problem Solving
		Real Numbers	Writing and Justifying Steps with Properties
B.12.6	Routinely assess the acceptable limits of error when		
B.12.6.a	evaluating strategies	Real Numbers	Estimation and Problem Solving
B.12.6.b	testing the reasonableness of results	Equations	Solving Equations
B.12.6.c	using technology to carry out computations	Variables and Expressions	Expressions with Powers

C.12	Geometry		
C.12.1	Identify, describe, and analyze properties of figures, relationships among figures, and relationships among their parts by		
C.12.1.a	constructing physical models		
C.12.1.b	drawing precisely with paper-and-pencil, hand calculators, and computer software		
C.12.1.c	using appropriate transformations (e.g., translations, rotations, reflections, enlargements)		
C.12.1.d	using reason and logic	Variables and Expression	Inductive and Deductive Reasoning
C.12.2	Use geometric models to solve mathematical and real-world problems	Polynomials	Addition and Subtraction of Polynomials (perimeter)
		Polynomials	Multiplication and Division of Polynomials (area and volume)
		Equations	Equations (surface areas)
		Equations	Formulas (area and volume)
C.12.3	Present convincing arguments by means of demonstration, informal proof, counter-examples, or any other logical means to show the truth of		
C.12.3.a	statements (e.g., these two triangles are not congruent)		
C.12.3.b	generalizations (e.g., the Pythagorean theorem holds for all right triangles)		
C.12.4	Use the two-dimensional rectangular coordinate system and algebraic procedures to describe and characterize geometric properties and relationships such as slope, intercepts, parallelism, and perpendicularity	Functions and Linear Equations	More About Slope
		Functions and Linear Equations	Parallel and Perpendicular Lines
		Functions and Linear Equations	Graphing Using x and y-intercepts

		Functions and Linear Equations	Graphing Using Slope and Intercept
C.12.5	Identify and demonstrate an understanding of the three ratios used in right-triangle trigonometry (sine, cosine, tangent)		
D.12	Measurement		
D.12.1	Identify, describe, and use derived attributes (e.g., density, speed, acceleration, pressure) to represent and solve problem situations	Equations	Rate Problems
D.12.2	Select and use tools with appropriate degree of precision to determine measurements directly within specified degrees of accuracy and error (tolerance)		
D.12.3	Determine measurements indirectly, using		
D.12.3.a	estimation	Real Numbers	Estimation and Problem Solving
D.12.3.b	proportional reasoning, including those involving squaring and cubing (e.g., reasoning that areas of circles are proportional to the squares of their radii)	Equations	Proportion and Percent
D.12.3.c	techniques of algebra, geometry, and right triangle trigonometry	Quadratics and Radicals	Pythagorean Theorem
D.12.3.d	formulas in applications (e.g., for compound interest, distance formula)	Equations	Formulas
		Equations	Rate Problems
D.12.3.e	geometric formulas to derive lengths, areas, or volumes of shapes and objects (e.g., cones, parallelograms, cylinders, pyramids)	Polynomials	Addition and Subtraction of Polynomials (perimeter)
		Polynomials	Multiplication and Division of Polynomials (area and volume)
		Equations	Equations (surface areas)
		Equations	Formulas (area and volume)

D.12.3.f	geometric relationships and properties of circles and polygons (e.g., size of central angles, area of a sector of a circle)		
D.12.3.g	conversion constants to relate measures in one system to another (e.g., meters to feet, dollars to Deutschmarks)		
E.12	Statistics and Probability		
E.12.1	Work with data in the context of real-world situations by		
E.12.1.a	formulating hypotheses that lead to collection and analysis of one- and two-variable data	Equations	Scatterplots and Correlation
		Equations	Line of Fit
E.12.1.b	designing a data collection plan that considers random sampling, control groups, the role of assumptions, etc.		
E.12.1.c	conducting an investigation based on that plan		
E.12.1.d	using technology to generate displays, summary statistics, and presentations		
E.12.2	Organize and display data from statistical investigations using		
E.12.2.a	frequency distributions	Solving Systems	Histograms
		Solving Systems	Stem and Leaf Plots
		Solving Systems	Box Plots
E.12.2.b	percentiles, quartiles, deciles	Solving Systems	Box Plots
E.12.2.c	line of best fit (estimated regression line)	Equations	Scatterplots and Correlation
		Equations	Line of Fit
E.12.2.d	matrices	Solving Systems	The Matrix
E.12.3	Interpret and analyze information from organized and displayed data when given		
E.12.3.a	measures of dispersion, including standard deviation and variance	Variables and Expressions	Mean, Median, and Mode
		Solving Systems	Stem and Leaf Plots
		Solving Systems	Box Plots
E.12.3.b	measures of reliability		
E.12.3.c	measures of correlation	Equations	Scatterplots and Correlation

E.12.4	Analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, advertising, etc.		
E.12.5	Determine the likelihood of occurrence of complex events by		
E.12.5.a	using a variety of strategies (e.g., combinations) to identify possible outcomes	Rational Expressions	Probability
E.12.5.b	conducting an experiment		
E.12.5.c	designing and conducting simulations		
E.12.5.d	applying theoretical probability	Rational Expressions	Probability
F.12	Algebraic Relationships		
F.12.1	Analyze and generalize patterns of change (e.g., direct and inverse variation) and numerical sequences, and then represent them with algebraic expressions and equations	Rational Expressions	Indirect Variation
	Analyze and generalize patterns of change (e.g., direct and inverse variation) and numerical sequences, and then represent them with algebraic expressions and equations	Exponentials	Geometric Sequences
		Functions and Linear Equations	Number Patterns
		Functions and Linear Equations	Arithmetic Sequences
		Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Direct Variation
F.12.2	Use mathematical functions (e.g., linear, exponential, quadratic, power) in a variety of ways, including		

F.12.2.a	recognizing that a variety of mathematical and real-world phenomena can be modeled by the same type of function	Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Direct Variation
		Quadratics and Radicals	Quadratic Functions
		Exponentials	Exponential Functions
		Rational Expressions	Indirect Variation
F.12.2.b	translating different forms of representing them (e.g., tables, graphs, functional notation, formulas)	Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Direct Variation
		Functions and Linear Equations	Linear Equations
		Functions and Linear Equations	Graphing Linear Equations
		Quadratics and Radicals	Quadratic Functions
		Quadratics and Radicals	Solving Quadratic Equations
		Exponentials	Exponential Functions
		Exponentials	Growth and Decay
		Rational Expressions	Indirect Variation
F.12.2.c	describing the relationships among variable quantities in a problem	Equations	Formulas and Absolute Value
		Equations	Rate Problems
		Equations	Mixture Problems
		Equations	Work Problems
		Functions and Linear Equations	Relations and Functions
		Functions and Linear Equations	Slope and Intercept
		Functions and Linear Equations	Linear Pattern
		Functions and Linear Equations	Direct Variation
		Rational Expressions	Indirect Variation

		Quadratics and Radicals	Quadratic Functions
		Quadratics and Radicals	Solving Quadratic Equations
		Exponentials	Exponential Functions
		Exponentials	Exponential Functions
		Exponentials	Growth and Decay
		Solving Systems	Graphing Linear Systems
		Solving Systems	Substitution
		Solving Systems	Elimination
		Solving Systems	Graphing Systems of Inequalities
		Solving Systems	Problem Solving (linear programming)
F.12.2.d	using appropriate technology to interpret properties of their graphical representations (e.g., intercepts, slopes, rates of change, changes in rates of change, maximum, minimum)		
F.12.3	Solve linear and quadratic equations, linear inequalities, and systems of linear equations and inequalities		
F.12.3.a	numerically	Functions and Linear Equations	Slope-Intercept Form
		Functions and Linear Equations	Point-Slope Form
		Functions and Linear Equations	Direct Variation
		Equations	Equations
		Equations	Multi-Step Equations
		Equations	Formulas and Absolute Value
		Equations	Problem Solving
		Quadratics and Radicals	Solving by Factoring
		Quadratics and Radicals	Solving by Square Root
		Quadratics and Radicals	Solving by Completing the Square
		Quadratics and Radicals	Solving by Quadratic Formula
		Polynomials	Solving by Factoring
		Solving Systems	Substitution
		Solving Systems	Elimination
		Inequalities	Simple Inequalities



		Inequalities	Multi-Step and Complex Inequalities
		Inequalities	Absolute Value Inequalities
F.12.3.b	graphically, including use of appropriate technology	Solving Systems	Solving Linear Systems by Graphing
		Solving Systems	Solving Inequality Systems by Graphing
		Quadratics and Radicals	Solving Quadratics by Graphing
F.12.3.c	symbolically, including use of the quadratic formula	Functions and Linear Equations	Slope-Intercept Form
		Functions and Linear Equations	Point-Slope Form
		Functions and Linear Equations	Direct Variation
		Equations	Equations
		Equations	Multi-Step Equations
		Equations	Formulas and Absolute Value
		Equations	Problem Solving
		Quadratics and Radicals	Solving by Factoring
		Quadratics and Radicals	Solving by Square Root
		Quadratics and Radicals	Solving by Completing the Square
		Quadratics and Radicals	Solving by Quadratic Formula
		Polynomials	Solving by Factoring
		Solving Systems	Substitution
		Solving Systems	Elimination
		Inequalities	Simple Inequalities
		Inequalities	Multi-Step and Complex Inequalities
		Inequalities	Absolute Value Inequalities
F.12.4	Model and solve a variety of mathematical and real-world problems by using algebraic expressions, equations, and inequalities	Equations	Equations
		Equations	Multi-Step Equations
		Equations	Formulas and Absolute Value
		Equations	Problem Solving
		Quadratics and Radicals	Solving by Graphing
		Quadratics and Radicals	Solving by Factoring



		Quadratics and Radicals	Solving by Square Root
		Quadratics and Radicals	Solving by Completing the Square
		Quadratics and Radicals	Solving by Quadratic Formula
		Polynomials	Solving by Factoring
		Solving Systems	Solving Systems by Graphing
		Solving Systems	Problem Solving
		Inequalities	Simple Inequalities
		Inequalities	Multi-Step and Complex Inequalities
		Inequalities	Absolute Value Inequalities
		Functions and Linear Equations	Writing and Graphing Linear Equations
		Functions and Linear Equations	Linear Equations
		Functions and Linear Equations	Direct Variation