



# Alignment Document

## State of Texas (TAKS) And Aventa Learning Algebra I

### Algebra I 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
1	The student will describe functional relationships in a variety of ways.		
1.A.1	The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways.		
1.A.1.A	describe independent and dependent quantities in functional relationships;	Functions and Linear Equations	Functions
		Functions and Linear Equations	Replacement Sets and Variables
1.A.1.B	[gather and record data and] use data sets to determine functional relationships between quantities;	Functions and Linear Equations	Functions
		Functions and Linear Equations	Line of Fit
		Solving Systems	Analyzing Statistical Data
		Solving Systems	Histograms
1.A.1.C	describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations;	Inequalities	Absolute Value Inequalities
		Inequalities	Solving Inequalities by Addition and Subtraction
		Inequalities	Inequalities in Two Variables
		Inequalities	Compound Inequalities
		Inequalities	Solving Inequalities Using Multiplication and Division
		Inequalities	Multi-Step Inequalities



		Inequalities	Graphing Inequalities in Two Variables
		Equations	Distance Formula
		Equations	Solving Problems
		Equations	Equations with Variables on Each Side
		Equations	Multiplication and Division in Equations
		Equations	Mixture Problems
		Equations	Parentheses in Equations
		Equations	Equations and Problem Solving
		Equations	Rate Problems
		Equations	Solving Multi-Step Equations
		Functions and Linear Equations	Functions
		Exponentials	Exponential Equations
1.A.1.D	represent relationships among quantities using [concrete] models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities; and	Inequalities	Absolute Value Inequalities
		Inequalities	Inequalities in Two Variables
		Inequalities	Multi-Step Inequalities
		Inequalities	Solving Inequalities Using Multiplication and Division
		Inequalities	Compound Inequalities
		Inequalities	Solving Inequalities by Addition and Subtraction
		Inequalities	Graphing Inequalities in Two Variables
		Functions and Linear Equations	Functions
		Functions and Linear Equations	The Coordinate System
		Equations	Distance Formula
		Equations	Multiplication and Division in Equations
		Equations	Equations with Variables on Each Side
		Equations	Mixture Problems
		Equations	Parentheses in Equations
		Equations	Equations and Problem Solving



		Equations	Solving Multi-Step Equations
		Equations	Rate Problems
		Equations	Solving Problems
		Exponentials	Exponential Equations
1.A.1.E	interpret and make decisions, predictions, and critical judgments from functional relationships.	Functions and Linear Equations	Functions
2	The student will demonstrate an understanding of the properties and attributes of functions.		
2.A.2	The student uses the properties and attributes of functions.		
2.A.2.A	identify [and sketch] the general forms of linear ( $y = x$ ) and quadratic ( $y = x^2$ ) parent functions;	Quadratics and Radicals	Graphing Quadratics
		Quadratics and Radicals	Graphing Quadratic Functions
2.A.2.B	identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete;	Functions and Linear Equations	Graphs of Inverses
		Functions and Linear Equations	Relations
2.A.2.C	interpret situations in terms of given graphs [or create situations that fit given graphs]; and	Functions and Linear Equations	The Coordinate System
2.A.2.D	[collect and] organize data, [make and] interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.	Solving Systems	Analyzing Statistical Data
		Solving Systems	Histograms
2.A.3	The student understands how algebra can be used to express generalizations and recognizes and uses the power of symbols to represent situations.		
2.A.3.A	use symbols to represent unknowns and variables; and	Variables and Expressions	Algebraic Expressions
		Variables and Expressions	Expressions with Powers
2.A.3.B	look for patterns and represent generalizations algebraically.	Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Line of Fit
		Functions and Linear Equations	Number Patterns



		Functions and Linear Equations	Scatter Plots and Correlation
2.A.4	The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations.		
2.A.4.A	find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations;	Equations	Formulas as Equations
		Equations	Addition and Subtraction in Equations
		Equations	Mixture Problems
		Equations	Equations with Variables on Each Side
		Equations	Solving Problems
		Equations	Solving Multi-Step Equations
		Equations	Multiplication and Division in Equations
		Quadratics and Radicals	Solving by Using Square Roots
		Polynomials	Solving Equations Using Factoring
		Polynomials	Factoring Perfect Square Trinomials
		Polynomials	Factoring with the GCF
		Polynomials	Difference of Two Squares
		Polynomials	Multiplying Polynomials by a Monomial
		Polynomials	Factoring Simple Trinomials
		Polynomials	Factoring Other Trinomials
		Variables and Expressions	Multiplying and Dividing Integers
		Variables and Expressions	Multiplying Monomials
		Variables and Expressions	Order of Operations
		Variables and Expressions	Dividing Monomials
		Real Numbers	Decimals
		Exponentials	Exponential Equations



		Functions and Linear Equations	Functions
2.A.4.B	use the commutative, associative, and distributive properties to simplify algebraic expressions; and	Real Numbers	Decimals
		Real Numbers	Division of Rational Numbers
		Real Numbers	Writing and Justifying Steps Using Properties
		Real Numbers	Evaluating Division Expressions
		Variables and Expressions	Multiplying and Dividing Integers
		Variables and Expressions	The Distributive Property
		Variables and Expressions	The Associative Property
		Variables and Expressions	The Commutative Property
		Variables and Expressions	Order of Operations
2.A.4.C	connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$ .	Equations	Rate Problems
		Equations	Solving Problems
		Equations	Equations and Problem Solving
		Equations	Distance Formula
		Equations	Solving Multi-Step Equations
		Equations	Multiplication and Division in Equations
		Equations	Equations with Variables on Each Side
		Equations	Mixture Problems
		Equations	Parentheses in Equations
		Functions and Linear Equations	Functions
		Exponentials	Exponential Equations
3	The student will demonstrate an understanding of linear functions.		
3.A.5	The student understands that linear functions can be represented in different ways and translates among their various representations.		
3.A.5.A	determine whether or not given situations can be represented by linear functions; and	Functions and Linear Equations	Functions



3.A.5.C	use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.	Functions and Linear Equations	Functions
		Variables and Expressions	Algebraic Expressions
		Variables and Expressions	Expressions with Powers
		Equations	Equations
3.A.6	The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations.		
3.A.6.A	develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations;	Functions and Linear Equations	More about Slope
		Variables and Expressions	Tables and Graphs
3.A.6.B	interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs;	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	More about Slope
		Solving Systems	Histograms
		Solving Systems	Analyzing Statistical Data
		Variables and Expressions	Tables and Graphs
3.A.6.C	investigate, describe, and predict the effects of changes in $m$ and $b$ on the graph of $y = mx + b$ ;	Variables and Expressions	Tables and Graphs
3.A.6.D	graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and $y$ -intercept;	Functions and Linear Equations	More about Slope
		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		Functions and Linear Equations	Graphing an Equation Using Points
		Functions and Linear Equations	Graphing an Equation Using Intercepts
		Quadratics and Radicals	Graphing Quadratic Functions
		Solving Systems	Review of Graphing Linear Equations



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3.A.6.E	determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations;	Variables and Expressions	Tables and Graphs
3.A.6.F	interpret and predict the effects of changing slope and y-intercept in applied situations; and	Functions and Linear Equations	More about Slope
		Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		Functions and Linear Equations	Graphing an Equation Using Intercepts
3.A.6.G	relate direct variation to linear functions and solve problems involving proportional change.	Functions and Linear Equations	Direct Variation
		Equations	Ratios and Proportions
4	The student will formulate and use linear equations and inequalities.		
4.A.7	The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation.		
4.A.7.A	analyze situations involving linear functions and formulate linear equations or inequalities to solve problems;	Equations	Equations with Variables on Each Side
		Equations	Parentheses in Equations
		Equations	Solving Problems
		Equations	Multiplication and Division in Equations
		Equations	Rate Problems
		Equations	Mixture Problems
		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	Slope-Intercept Form
		Functions and Linear Equations	Writing Linear Equations
		Functions and Linear Equations	Linear Patterns
		Inequalities	Graphing Inequalities in Two Variables
		Inequalities	Solving Inequalities Using Multiplication and Division
		Inequalities	Inequalities in Two Variables



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4.A.7.B	investigate methods for solving linear equations and inequalities using [concrete] models, graphs, and the properties of equality, select a method, and solve the equations and inequalities; and	Inequalities	Compound Inequalities
		Inequalities	Graphing Inequalities in Two Variables
		Inequalities	Solving Inequalities Using Multiplication and Division
		Inequalities	Inequalities in Two Variables
		Inequalities	Solving Inequalities by Addition and Subtraction
		Inequalities	Multi-Step Inequalities
		Functions and Linear Equations	Linear Patterns
		Functions and Linear Equations	Graphing an Equation Using Points
		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	Slope-Intercept Form
		Functions and Linear Equations	Writing Linear Equations
		Equations	Rate 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
		Equations	Addition and Subtraction in Equations
		Equations	Parentheses in Equations
		Equations	Mixture Problems
		Quadratics and Radicals	Graphing Quadratic Functions
		Real Numbers	Writing and Justifying Steps Using Properties
		Real Numbers	Properties of Closure and Equality
		Real Numbers	Using the Properties



		Solving Systems	Review of Graphing Linear Equations
4.A.7.C	interpret and determine the reasonableness of solutions to linear equations and inequalities.	Functions and Linear Equations	Linear Patterns
		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	Slope-Intercept Form
		Functions and Linear Equations	Writing Linear Equations
		Equations	Mixture Problems
		Equations	Solving Problems
		Equations	Rate Problems
		Equations	Multiplication and Division in Equations
		Equations	Equations with Variables on Each Side
		Equations	Parentheses in Equations
		Inequalities	Graphing Inequalities in Two Variables
		Inequalities	Inequalities in Two Variables
		Inequalities	Solving Inequalities Using Multiplication and Division
4.A.8	The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation.		
4.A.8.A	analyze situations and formulate systems of linear equations in two unknowns to solve problems.	Functions and Linear Equations	Linear Patterns
		Solving Systems	Solving with Elimination
		Solving Systems	Solving with Substitution
		Solving Systems	Systems of equations
		Solving Systems	Problem Solving with Systems
5	The student will demonstrate an understanding of quadratic and other nonlinear functions.		
5.A.9	The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions.		



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5.A.9.C	investigate, describe, and predict the effects of changes in $c$ on the graph of $y = ax^2 + c$ .	Functions and Linear Equations	The Coordinate System
		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
		Solving Systems	Review of Graphing Linear Equations
5.A.11	The student understands there are situations modeled by functions that are neither linear nor quadratic and models the situations.		
5.A.11.A	use [patterns to generate] the laws of exponents and apply them in problem-solving situations.	Functions and Linear Equations	Number Patterns
		Functions and Linear Equations	Line of Fit
		Functions and Linear Equations	Scatter Plots and Correlation
		Functions and Linear Equations	Linear Patterns
		Variables and Expressions	Fractional Exponents
		Variables and Expressions	Problem Solving using Exponents and Roots
6	The student will demonstrate an understanding of geometric relationships and spatial reasoning.		
6.8.6	The student uses transformational geometry to develop spatial sense.		
6.8.6.A	generate similar figures using dilations including enlargements and reductions; and		
6.8.6.B	graph dilations, reflections, and translations on a coordinate plane.		
6.8.7	The student uses geometry to model and describe the physical world.		
6.8.7.D	locate and name points on a coordinate plane using ordered pairs of rational numbers.	Functions and Linear Equations	The Coordinate System
7	The student will demonstrate an understanding of two- and three-dimensional representations of geometric relationships and shapes.		
7.8.7	The student uses geometry to model and describe the physical world.		



7.8.7.A	draw three-dimensional figures from different perspectives;		
7.8.7.B	use geometric concepts and properties to solve problems in fields such as art and architecture; and		
7.8.7.C	use pictures or models to demonstrate the Pythagorean Theorem.	Quadratics and Radicals	Pythagorean Theorem
8	The student will demonstrate an understanding of the concepts and uses of measurement and similarity.		
8.8.8	The student uses procedures to determine measures of three-dimensional figures.		
8.8.8.A	find lateral and total surface area of prisms, pyramids, and cylinders using [concrete] models and nets (two-dimensional models);		
8.8.8.B	connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects; and	Real Numbers	Estimation with Real Numbers
8.8.8.C	estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume.	Real Numbers	Estimation
		Real Numbers	Estimation with Real Numbers
8.8.9	The student uses indirect measurement to solve problems.		
8.8.9.A	use the Pythagorean Theorem to solve real-life problems; and	Quadratics and Radicals	Pythagorean Theorem
8.8.9.B	use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.	Equations	Ratios and Proportions
8.8.10	The student describes how changes in dimensions affect linear, area, and volume measures.		
8.8.10.A	describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally; and	Equations	Ratios and Proportions
		Real Numbers	Estimation with Real Numbers
8.8.10.B	describe the resulting effect on volume when dimensions of a solid are changed proportionally.	Equations	Ratios and Proportions
		Real Numbers	Estimation with Real Numbers



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9	The student will demonstrate an understanding of percents, proportional relationships, probability, and statistics in application problems.		
9.8.1	The student understands that different forms of numbers are appropriate for different situations.		
9.8.1.B	select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships.	Real Numbers	Adding Fractions with Real Numbers
		Real Numbers	Fractions
		Real Numbers	Order of Numbers
		Real Numbers	Rational Numbers
		Real Numbers	Subtracting Fractions with Real Numbers
		Real Numbers	Number Sets
		Rational Expressions	Probability Expressed as a Decimal Number
9.8.3	The student identifies proportional or non-proportional linear relationships in problem situations and solves problems.		
9.8.3.B	estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.	Equations	Percent of Change
		Equations	Percent of a Number
		Real Numbers	Estimation
		Real Numbers	Estimation with Real Numbers
9.8.11	The student applies concepts of theoretical and experimental probability to make predictions.		
9.8.11.A	find the probabilities of dependent and independent events; and	Rational Expressions	Using Data to Make Predictions
9.8.11.B	use theoretical probabilities and experimental results to make predictions and decisions.	Rational Expressions	Using Data to Make Predictions
		Rational Expressions	Counting: An introduction to the Multiplication Principle
		Rational Expressions	More about the Multiplication Principle
		Rational Expressions	The Basics of Probability
9.8.12	The student uses statistical procedures to describe data.		



9.8.12.A	select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation; and	Solving Systems	Analyzing Statistical Data
		Solving Systems	Histograms
		Solving Systems	Statistics
		Variables and Expressions	Stem and Leaf Plots
		Variables and Expressions	Mean, Median and Mode
		Functions and Linear Equations	Line of Fit
9.8.12.C	select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, [stem and leaf plots,] circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.	Variables and Expressions	Tables and Graphs
		Solving Systems	Analyzing Statistical Data
		Solving Systems	Histograms
9.8.13	The student evaluates predictions and conclusions based on statistical data.		
9.8.13.B	recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.	Solving Systems	Analyzing Statistical Data
10	The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.		
10.8.14	The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.		
10.8.14.A	identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;		
10.8.14.B	use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness; and	Equations	Equations with Variables on Each Side



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10.8.14.C	select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.	Equations	Solving Problems
		Real Numbers	Problem Solving
		Equations	Equations and Problem Solving
10.8.15	The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.		
10.8.15.A	communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.		
10.8.16	The student uses logical reasoning to make conjectures and verify conclusions.		
10.8.16.A	make conjectures from patterns or sets of examples and nonexamples; and		
10.8.16.B	validate his/her conclusions using mathematical properties and relationships.	All Units	