Algebra 1

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
AI.1.0	Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:	Throughout course	Throughout course
AI.1.1	Students use properties of numbers to demonstrate whether assertions are true or false.	Numbers and Expressions	Some Useful Properties
AI.2.0	Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.	Numbers and Expressions	Exponents and Roots
AI.3.0	Students solve equations and inequalities involving absolute values.	Equations Inequalities	Formulas and Absolute Value Absolute Value Inequalities
AI.4.0	Students simplify expressions before solving linear equations and inequalities in one variable, such as 3(2x - 5) + 4(x - 2) = 12.	Equations	Multi-Step Problems
AI.5.0	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	Equations	Multi-Step Problems
AI.6.0	Students graph a linear equation and compute the x-and y-intercepts (e.g., graph 2x + 6y = 4). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by 2x + 6y < 4).	Functions and Linear Equations Inequalities	Graphing Linear Equations Graphing Inequalities in Two Variables
AI.7.0	Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula.	Functions and Linear Equations	Linear Equations
AI.8.0	Students understand the concepts of parallel lines and perpendicular	Functions and Linear Equations	Linear Equations

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	lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.		
AI.9.0	Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.	Solving Systems	Systems of Equations Solving Systems Systems of Inequalities
AI.10.0	Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.	Polynomials	Add and Subtract Polynomials Multiply Polynomials
AI.11.0	Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.	Polynomials	Factors and GCF Factoring Trinomials Special Factors
AI.12.0	Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.	Rational Expressions	Multiplying and Dividing Rational Expressions
AI.13.0	Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.	Rational Expressions	Multiplying and Dividing Rational Expressions

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AI.14.0	Students solve a quadratic equation by factoring or completing the square.	Quadratics and Radicals	Solving Quadratic Equations
AI.15.0	Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.	Equations	Problem Solving
AI.16.0	Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.	Functions and Linear Equations	The Coordinate Plane and Relations Linear Equations
AI.17.0	Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.	Functions and Linear Equations	The Coordinate Plane and Relations
AI.18.0	Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.	Functions and Linear Equations	Linear Equations
AI.19.0	Students know the quadratic formula and are familiar with its proof by completing the square.	Quadratics and Radicals	Solving Quadratic Equations
AI.20.0	Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.	Quadratics and Radicals	Solving Quadratic Equations
AI.21.0	Students graph quadratic functions and know that their roots are the x-intercepts.	Quadratics and Radicals	Quadratic Functions

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AI.22.0	Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.	Quadratics and Radicals	Solving Quadratic Equations
AI.23.0	Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.	Quadratics and Radicals	Quadratic Functions
AI.24.0	Students use and know simple aspects of a logical argument:	Throughout course	Throughout course
AI.24.1	Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.	Numbers and Expressions	Logic and Graphs
AI.24.2	Students identify the hypothesis and conclusion in logical deduction.	Numbers and Expressions	Logic and Graphs
AI.24.3	Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.	Numbers and Expressions	Logic and Graphs
AI.25.0	Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:	Throughout course	Throughout course
AI.25.1	Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.	Numbers and Expressions	Logic and Graphs
AI.25.2	Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step.	Numbers and Expressions	Logic and Graphs
AI.25.3	Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.	Equations Quadratics and Radicals	Formulas and Absolute Value Solving Quadratic Equations