

California Mathematics Standards Alignment to:

- the Common Core State Standards (CCSS)
- the National Essential Skills Study (NESS)

Please note that the National Essential Skills Study (NESS) is only aligned to the California mathematics standards. The NESS descriptors are not intentionally aligned to the Common Core State Standards (CCSS) or their subparts. Any alignment between NESS descriptors and CCSS is coincidental.

California Mathematics Standards/Benchmarks Algebra I	Common Core Mathematics Domains/Clusters/Standards High School	National Essential Skills Study (NESS) Rankings	
		Rank	
Algebra I			
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:			
1.1 Students use properties of numbers to demonstrate whether assertions are true or false.	<p><u>Number & Quantity: The Real Number System</u> Use properties of rational and irrational numbers. 3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</p> <p><u>Algebra: Reasoning with Equations & Inequalities</u> Understand solving equations as a process of reasoning and explain the reasoning. 1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. 2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</p>	M2	Understand and apply basic algebraic properties (commutative and associative laws of addition and multiplication, distributive law of multiplication over addition, and identities and inverses
		M10	Understand and apply a systematic methodology or procedure (e.g., direct or indirect measurement, direct or indirect proof, inductive or deductive reasoning) to model and solve problems.
		M35	Use the properties of real (rational and irrational) numbers and demonstrate understanding of ordering and absolute value.

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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.	<p><u>Number & Quantity: The Real Number System</u> Extend the properties of exponents to rational exponents.</p> <ol style="list-style-type: none"> 1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.</i> 2. Rewrite expressions involving radicals and rational exponents using the properties of exponents. <p><u>Algebra: Reasoning with Equations & Inequalities</u> Solve equations and inequalities in one variable.</p> <ol style="list-style-type: none"> 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 4. Solve quadratic equations in one variable. <ol style="list-style-type: none"> b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. 	M20	Understand and apply the basic properties and laws of exponents and scientific notation to solve problems, including those with fractional, negative, and zero exponents.	
3.0 Students solve equations and inequalities involving absolute values.	<p><u>Algebra: Reasoning with Equations & Inequalities</u> Solve equations and inequalities in one variable.</p> <ol style="list-style-type: none"> 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. <p><u>Functions: Interpreting Functions</u> Analyze functions using different representations.</p> <ol style="list-style-type: none"> 7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. <ol style="list-style-type: none"> b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 	M7	Simplify and solve algebraic equations by identifying and using the correct order of operations and techniques necessary to carry out the solution.	
		M35	Use the properties of real (rational and irrational) numbers and demonstrate understanding of ordering and absolute value.	
		M45	Solve linear inequalities and graph the solution set on a number line.	

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4.0 Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.	<p><u>Algebra: Seeing Structure in Expressions</u> Interpret the structure of expressions.</p> <ol style="list-style-type: none"> Interpret expressions that represent a quantity in terms of its context. <ol style="list-style-type: none"> Interpret parts of an expression, such as terms, factors, and coefficients. Use the structure of an expression to identify ways to rewrite it. <i>For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</i> <p><u>Algebra: Arithmetic with Polynomials & Rational Expressions</u> Perform arithmetic operations on polynomials.</p> <ol style="list-style-type: none"> Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. <p><u>Algebra: Reasoning with Equations & Inequalities</u> Solve equations and inequalities in one variable.</p> <ol style="list-style-type: none"> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 	M7	Simplify and solve algebraic equations by identifying and using the correct order of operations and techniques necessary to carry out the solution.
5.0 Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	<p><u>Algebra: Reasoning with Equations & Inequalities</u> Understand solving equations as a process of reasoning and explain the reasoning.</p> <ol style="list-style-type: none"> Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. <p>Solve equations and inequalities in one variable.</p> <ol style="list-style-type: none"> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 	M7	Simplify and solve algebraic equations by identifying and using the correct order of operations and techniques necessary to carry out the solution.
		M10	Understand and apply a systematic methodology or procedure (e.g., direct or indirect measurement, direct or indirect proof, inductive or deductive reasoning) to model and solve problems.
		M27	Find the solution of linear equations and inequalities where the variable appears on either or both sides and in which one or both sides must be simplified before solving the equation (e.g., solve $x + 2(x - 3) = -4x + 5$ for x).