

California State Core Curriculum
Standards adopted 1997
Algebra I

Strand	Description	High School Algebra Boardworks presentations
1	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.	Classifying numbers Calculating with integers
2	Students understand and use such operations as taking the opposite, finding a reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.	Exponents Zero, negative and fractional exponents
3	Students solve equations and inequalities involving absolute values.	Absolute value functions
4	Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions
5	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions
6	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 $2x + 6y < 4$).	Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables Linear graphs Slopes and intercepts

7	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.	Slopes and intercepts Coordinate geometry The equation of a straight line
8	Students understand the concepts of parallel lines and perpendicular 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.	Parallel and perpendicular lines
9	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.	Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Problems leading to systems of equations
10	Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.	Operations with polynomials Dividing polynomials The factor theorem
11	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.	Factoring Factoring quadratic expressions Quadratic equations and factoring Completing the square
12	Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.	Algebraic fractions Simplifying rational functions Operations with algebraic fractions Improper fractions
13	Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.	Algebraic fractions Simplifying rational functions Operations with algebraic fractions Improper fractions
14	Students solve a quadratic equation by factoring or completing the square.	Factoring Factoring quadratic expressions Quadratic equations and factoring Completing the square

15	Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.	Problems leading to systems of equations Problems leading to quadratic equations Fractions, decimals and percentages Percentages of quantities Finding a percentage change Increasing and decreasing by a percentage Percentage problems
16	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.	Function notation Functions and relations
17	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.	Domain, range and composite functions
18	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 relations
19	Students know the quadratic formula and are familiar with its proof by completing the square.	The quadratic formula Completing the square
20	Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.	The quadratic formula
21	Students graph quadratic functions and know that their roots are the x-intercepts.	Graphs of quadratic functions
22	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.	Solving quadratic equations
23	Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.	Problems leading to quadratic equations
24	Students use and know simple aspects of a logical argument:	

24.1	Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.	–
24.2	Students identify the hypothesis and conclusion in logical deduction.	–
24.3	Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.	–
25	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:	
25.1	Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.	–
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.	–
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.	–