

Key to Algebra

**Correlation with the
California
Math Content Standards**

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Key To Algebra

Key to Algebra was developed with the belief that anyone can learn basic algebra if the subject is presented in a friendly, non-threatening manner and someone is available to help when needed. Some teachers use **Key to Algebra** as the basic text for individualized algebra course, while others use it as a supplement to their regular hardbound text.

Key to Algebra shouldn't replace group exploration of concepts, cooperative problem or class discussions.

Books 1-4 are restricted to operations on integers so that students who have not yet mastered fractions can begin their study of algebra. In Books 5-7 operations on fractions are taught as students study rational algebraic expressions. Books 8-10 cover real numbers, graphs, system of equations, square roots and quadratic equations. Together these books comprise a complete introductory algebra course.

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<p>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.</p>	<p>Book 1- Operations on Integers</p> <ul style="list-style-type: none"> • Adding of integers p.9 • Subtracting of integers-p.18 • Multiplying Integers-p.24 • Dividing Integers-p.3 <p>Book 2-Variables, Terms, and Expressions</p> <ul style="list-style-type: none"> • Review of operations on integers-pp1-3 <p>Book 5-Rational Numbers</p> <ul style="list-style-type: none"> • Rational numbers-p.1 • Dividing integers-pp2/3 • Graphing integers-p.6 • Graphing rational numbers-pp.7-10 <p>Book 6-Multiplying and Dividing Rational Expression</p> <ul style="list-style-type: none"> • Multiplying Fractions-pp.6/7 • Reciprocals-p.30 • Dividing fractions and expressions- pp.31-34
<p>1.1 Students use properties of numbers to demonstrate whether assertions are true or false.</p>	<p>Book 1- Operations on Integers</p> <ul style="list-style-type: none"> • Principle of adding zero-p.11 • Commutative property for addition-p.12 • Associative principle-p.13 • Principle of adding opposites-p.16 • Commutative property for multiplication-p.26 • Associative property for multiplication-p.27 • Principle for multiplying by zero, one or negative one-p.28 • Distributive property –pp.31-32
<p>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>	<p>Book 1-Operations on Integers</p> <ul style="list-style-type: none"> • Opposites-p16 <p>Book 2-Variables, Terms, and Expressions</p> <ul style="list-style-type: none"> • Exponents-pp6-10 <p>Book 6-Multiplying and Dividing Rational Expression</p> <ul style="list-style-type: none"> • Reciprocals-pp30/31 <p>Book 10-Square Roots and Quadratic Equations</p> <ul style="list-style-type: none"> • Taking a root-Square roots and more-p13 • The product and quotient rules-pp13-21
<p>3.0 Students solve equations and inequalities involving absolute values.</p>	<p>Book 5-Rational Numbers</p> <ul style="list-style-type: none"> • Absolute Value-p14 • Solving inequalities-pp.18-23 • Solving equations involving absolute value-pp24-26
<p>4.0 Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.</p>	<p>Book 2-Variables, Terms, and Expressions</p> <ul style="list-style-type: none"> • Combining like terms-pp.20-24 • Simplify using order of operations-pp27-28 • Using the distributive principle-p29 <p>Book 3-Equations</p> <ul style="list-style-type: none"> • Solving equations-pp.1-34

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<p>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>	<p>The Key to Algebra materials do not address this standard</p>
<p>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 $2x + 6y < 4$).</p>	<p>Book 8-Graphs</p> <ul style="list-style-type: none"> • Linear equations-pp.18-19 • Compute y-intercept-pp.24-25 • Graphing Linear inequalities-pp.31-34
<p>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.</p>	<p>Book 8-Graphs</p> <ul style="list-style-type: none"> • The slope of a line-pp.20-25 • Writing linear equations in the form $Y = mx + b$-pp.26-27 • Finding the Equation of a Line-pp.28-29
<p>8.0 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.</p>	<p>The Key to Algebra materials do not address this standard</p>
<p>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.</p>	<p>Book 9-Systems of Equations</p> <ul style="list-style-type: none"> • System of equations-P.1 • Solving systems of equations by graphing-pp.2-7 • Solving system of equations by addition or subtraction –pp.8-11 • Solving system of equations by substitution-pp.12-15 • Solve by any method-pp.16-17 • Word problems involving systems of equations-pp.18-19 • Using the multiplication principle and solve-pp.20-27 • Solving more word problems-pp.28-29 • Solving system of inequalities-pp.30-34

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<p>10.0 Students add, subtract, multiply and divide monomials and polynomials. Students solve multistep problems, including word problems by using these techniques.</p>	<p>Book 2-Variables, Terms, and Expressions</p> <ul style="list-style-type: none"> • Multiplying terms-pp.12-14 • Areas of rectangles (word problems)-pp.16-17 • Like and unlike terms-p.18 • Combining like terms-pp.19-24 • Perimeters (word problems)-p.25-26 • Order of operations-pp.27-28 • Using the distributive property-p.29 <p>Book 4-Polynomials</p> <ul style="list-style-type: none"> • Adding polynomials-pp. 2 and 6 • Opposites of polynomials-p.3 • Subtracting polynomials-pp.5-5 • The distributive principle-pp.8-10 • Multiplying and factoring polynomials-pp.15-29 <p>Book 6-Multiplying and Dividing Rational Expressions</p> <ul style="list-style-type: none"> • Multiplying fractions (polynomials)-pp.7-8 • Simplifying fractions (dividing polynomials)-pp.15-17 • Simplifying fractions(dividing by a polynomial)-pp.18-21 • Dividing polynomials-pp.22-23 • Simplifying multiplication problems-pp.26-29 • Reciprocals-p.30 • Dividing fractions-pp.31-32 • Multiplication and division (monomials and polynomials)-pp.33-34 <p>Book 7-Adding and Subtracting Rational Expression</p> <ul style="list-style-type: none"> • Ratio Problems-pp.28-29 • Percent problems-pp.30-31 • Time problems-pp.32-33 • Problems about rational numbers-p.34
<p>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.</p>	<p>Book 4-Polynomials</p> <ul style="list-style-type: none"> • Factoring out a common term-pp.11-14, 24 • Multiplying and factoring polynomials-pp.15 • Factoring the difference of two squares-pp.21, 23,29 • Perfect square binomials- pp.20, 22, 25, 27 ,28, 29
<p>12.0 Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.</p>	<p>Book 6-Multiplying and Dividing Rational Expressions</p> <ul style="list-style-type: none"> • Simplifying rational expressions-pp.18-21

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<p>13.0 Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.</p>	<p>Book 6-Multiplying and Dividing Rational Expressions</p> <ul style="list-style-type: none"> • Multiplying fractions-pp.6-8 • Simplifying fractions (division)-pp.14-21 • Rewriting fractions in simplest form-p.25 • Simplifying multiplication problems-pp.27-29 • Dividing –pp.31-32 • Multiplication and division pp.33-34 <p>Book 7-Adding and Subtracting Rational Expressions</p> <ul style="list-style-type: none"> • Adding with common denominators-pp.1-5 • The opposite of a fraction-p.6 • Subtraction with common denominator-pp.7-10 • Adding and subtracting with different denominators-pp.11-14, 16-18 • Least Common Denominators-pp. 18-22 • Problems about rational numbers-p.34
<p>14.0 Students solve a quadratic equation by factoring or completing the square.</p>	<p>Book 4-Polynomials</p> <ul style="list-style-type: none"> • The zero product rule-p.30 • Quadratic equations-Factoring-pp.31-32 • Using quadratic equations-pp.33-34 <p>Book 10-Square Roots and Quadratic Equations</p> <ul style="list-style-type: none"> • Completing the square-pp.22-25
<p>15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>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.</p>	<p>Book 5-Rational Numbers</p> <ul style="list-style-type: none"> • Relations-pp.27-28 • Functions-pp.29-34
<p>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.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>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.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>19.0 Students know the quadratic formula and are familiar with its proof by completing the square.</p>	<p>Book 10-Square Roots and Quadratic Equations</p> <ul style="list-style-type: none"> • Know the quadratic formula-p.26

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<p>20.0 Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.</p>	<p>Book 10-Square Roots and Quadratic Equations</p> <ul style="list-style-type: none"> • Quadratic formula-pp.26-29 • Using the quadratic formula to solve problems-pp30-31
<p>21.0 Students graph quadratic functions and know that their roots are the x-intercepts.</p>	<p>Book 10-Square Roots and Quadratic Equations</p> <ul style="list-style-type: none"> • Graphs of quadratic functions-pp.33-34
<p>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.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>23.0 Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>24.0 Students use and know simple aspects of a logical argument.</p>	<p>The Key to Algebra materials do not address this Standard.</p>
<p>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</p>	<p>The Key to Algebra materials do not address this Standard.</p>

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