



# Introduction to the Revised Mathematics TEKS

A VERTICAL LOOK AT KEY CONCEPTS  
AND PROCEDURES  
ALGEBRA II



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Revised TEKS (2012): Building to Algebra II Attributes of Functions and Their Inverses – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7
<p>Graph square root, cube, cube root, exponential, logarithmic, absolute value, and rational functions, and analyze key attributes such as domain, range, intercepts, symmetries, asymptotic behavior, and maximum and minimum.</p> <p>Graph and write the inverse of a function using notation such as <math>f^{-1}(x)</math>.</p> <p>Describe and analyze the relationship between a function and its inverse, including restrictions on the domain and range.</p>	<p>Graph linear functions, and identify features including x-intercept, y-intercept, zeros, and slope.</p> <p>Solve literal equations for a specified variable.</p> <p>Determine domain and range of quadratic functions.</p>	<p>Use data from a table or graph to determine the rate of change or slope and y-intercept.</p>	<p>Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form <math>y = mx + b</math>.</p>

Revised TEKS (2012): Building to Algebra II Systems of Equations and Inequalities – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7
<p>Formulate and solve systems of equations, including those consisting of three variables and systems of two equations where the first is linear and the second is quadratic.</p> <p>Determine reasonableness of solutions.</p> <p>Formulate and solve systems of at least two linear inequalities in two variables.</p>	<p>Write and solve systems of two linear equations with two variables.</p> <p>Graph systems of two linear equations in two variables and estimate solutions if they exist.</p> <p>Write linear inequalities in two variables given a representation and graph the solution set.</p>	<p>Identify and verify the values of <math>x</math> and <math>y</math> that simultaneously satisfy two linear equations in the form <math>y = mx + b</math> from the intersections of the graphed equations.</p>	<p>Determine if given values make one-variable, two-step equations and inequalities true.</p>

**Revised TEKS (2012): Building to Algebra II Quadratic and Square Root Functions, Equations, and Inequalities –  
A Vertical Look at Key Concepts and Procedures**

Algebra II	Algebra I	Grade 8	Grade 7
<p>Write the quadratic function given three specified points in the plane.</p> <p>Write the equation of a parabola given attributes.</p> <p>Determine the effect on the graph of <math>f(x) = \sqrt{x}</math> when parameter changes are made.</p> <p>Transform a quadratic function in standard form to vertex form to identify the different attributes of the function.</p> <p>Solve quadratic, square root, and cube root equations.</p> <p>Identify extraneous solutions of equations.</p> <p>Solve quadratic inequalities.</p>	<p>Write equations of quadratic functions given the vertex and another point on the graph.</p> <p>Write quadratic functions when given real solutions and graphs of their related equations.</p> <p>Write a quadratic equation in vertex form.</p> <p>Rewrite a quadratic equation in vertex form in standard form.</p> <p>Determine the effects on the graph of the parent function <math>f(x) = x^2</math> when parameter changes are made.</p> <p>Graph quadratic functions and identify key attributes including <math>x</math>-intercepts, <math>y</math>-intercept, zeros, maximum value, minimum value, vertex, and the axis of symmetry.</p> <p>Solve quadratic equations that have real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula.</p>		

**Revised TEKS (2012): Building to Algebra II Exponential and Logarithmic Functions and Equations –  
A Vertical Look at Key Concepts and Procedures**

<b>Algebra II</b>	<b>Algebra I</b>	<b>Grade 8</b>	<b>Grade 7</b>
<p>Graph exponential and logarithmic equations, analyze key attributes such as domain, range, intercepts, symmetries, asymptotic behavior, and maximum and minimum.</p> <p>Determine the effects on the key attributes on the graphs of <math>f(x) = b^x</math> and <math>f(x) = \log_b(x)</math> where <math>b</math> is 2, 10, and <math>e</math> when <math>f(x)</math> is replaced by <math>af(x)</math>, <math>f(x) + d</math>, and <math>f(x - c)</math> for specific positive and negative real values of <math>a</math>, <math>c</math>, and <math>d</math>.</p> <p>Formulate and solve exponential and logarithmic equations that model real-world situations.</p> <p>Determine reasonableness of a solution to a logarithmic equation.</p>	<p>Determine domain and range of exponential functions.</p> <p>Interpret the meaning of values <math>a</math> and <math>b</math> in exponential functions of the form <math>f(x) = ab^x</math> in real world problems.</p>		

**Revised TEKS (2012): Building to Algebra II Cubic, Cube Root, Absolute Value, and Rational Functions, Equations, and Inequalities –  
A Vertical Look at Key Concepts and Procedures**

Algebra II	Algebra I	Grade 8	Grade 7
<p>Analyze the effect on the graph of <math>f(x) = x^3</math>, <math>f(x) =  x </math>, and <math>f(x) = \frac{1}{x}</math> when parameter changes are made.</p> <p>Graph cubic, cube root, absolute value, and rational functions, and analyze key attributes such as domain, range, intercepts, symmetries, asymptotic behavior, and maximum and minimum.</p> <p>Determine the asymptotic restrictions on the domain of a rational function and represent domain and range using interval notation, inequalities, and set notation.</p>	<p>Determine the effects on the graph of the parent function <math>f(x) = x^2</math> when parameter changes are made.</p>		
<p>Solve cube root equations that have real roots.</p>	<p>Solve quadratic equations that have real solutions.</p>		
<p>Formulate absolute value linear equations.</p> <p>Formulate rational equations.</p>	<p>Write linear equations in two variables in various forms given one point and the slope and given two points, including equations of a line that are parallel or perpendicular to a given line.</p>	<p>Write one-variable equations or inequalities with variables on both sides that represent problems.</p>	<p>Write one-variable, two-step equations and inequalities to represent problems.</p>
<p>Solve absolute value linear equations and inequalities.</p> <p>Solve rational equations that have real solutions.</p>	<p>Solve linear equations and inequalities in one variable, including multistep problems with the variable on both sides.</p>	<p>Solve one-variable equations with variables on both sides of the equal sign using rational number coefficients and constants.</p>	<p>Solve one-variable, two-step equations and inequalities.</p>
<p>Formulate and solve equations involving inverse variation.</p>	<p>Write and solve equations involving direct variation.</p>	<p>Solve problems involving direct variation.</p>	<p>Solve problems involving ratios, rates, and percents.</p> <p>Solve problems with similarity.</p>

Revised TEKS (2012): Building to Algebra II Number and Algebraic Methods – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7
<p>Add, subtract, and multiply complex numbers.</p> <p>Add, subtract, and multiply polynomials.</p> <p>Determine the sum, difference, product, and quotient of rational expressions with integral exponents of degree one and degree two.</p> <p>Rewrite radical expressions that contain variables to equivalent forms.</p> <p>Write domain and range of a function in interval notation, inequalities, and set notation.</p>	<p>Add, subtract, multiply, and divide polynomials.</p> <p>Rewrite polynomial expressions and other algebraic expressions in equivalent forms.</p> <p>Simplify numerical radical expressions involving square roots.</p> <p>Determine domain and range of linear functions.</p>		

Revised TEKS (2012): Building to Algebra II Data – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7
<p>Analyze data to select the appropriate model from among linear, quadratic, and exponential models.</p> <p>Use regression methods available through technology to write a linear function, quadratic function, and an exponential function from a given set of data.</p> <p>Predict and make decisions and critical judgments from a given set of data using linear, quadratic, and exponential models.</p>	<p>Determine if a relation is a function.</p> <p>Write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions.</p> <p>Using technology, write a quadratic function that provides a reasonable fit to data to estimate solutions and make predictions.</p>	<p>Identify functions using sets of ordered pairs, tables, mappings, and graphs.</p>	