



Introduction to the Revised Mathematics TEKS

A VERTICAL LOOK AT KEY CONCEPTS
AND PROCEDURES
ALGEBRA I



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Revised TEKS (2012): Building to Algebra I Linear Functions, Equations, and Inequalities – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
	Determine the slope of a line from various representations.	Use similar right triangles to develop an understanding that slope, given as the rate comparing change in y values to the change in x values is the same for any two points.	Determine constant of proportionality.	
	Calculate the rate of change of a linear function from various representations.	Graph proportional relationships, interpreting unit rate as the slope of the line that models the relationship.	Calculate unit rates.	
Write domain and range of a function in interval notation, inequalities, and set notation.	Determine domain and range of linear functions in real-world situations.			Identify independent and dependent quantities from tables and graphs.
Graph square root, cubic, 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.	Graph linear functions and identify features including x -intercept, y -intercept, zeros, and slope.	Use data from a table or graph to determine the rate of change or slope and y -intercept.	Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.	Write equations that represent relationships between independent and dependent quantities from tables.
	Determine the effects on the graph of the parent function $f(x) = x$ when parameter changes are made.			

Revised TEKS (2012): Building to Algebra I Linear Functions, Equations, and Inequalities – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
<p>Use regression methods available through technology to write a function from a given set of data.</p> <p>Predict and make decisions and critical judgments from a given set of data.</p>	<p>Write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions.</p>	<p>Contrast linear bivariate sets of data with non-linear bivariate sets of data from graphical representations.</p> <p>Use a trend line for linear bivariate sets of data to make predictions.</p> <p>Construct scatterplots and describe association between bivariate data as linear, non-linear, or no association.</p>		<p>Graph points in all four quadrants using ordered pairs of rational numbers.</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 linear equations in two variables given a representation.</p>	<p>Write one-variable equations or inequalities with variables on both sides that represent problems.</p> <p>Write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using multiple representations.</p> <p>Distinguish between proportional and non-proportional situations using multiple representations.</p>	<p>Write one-variable, two-step equations and inequalities to represent problems.</p>	<p>Write one-variable, one-step equations and inequalities to represent problems.</p> <p>Write an equation that represents the relationship between independent and dependent quantities from a table.</p> <p>Represent a situation using multiple representations.</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>	<p>Solve problems with percents.</p> <p>Solve prediction and comparison problems, including contexts with probability and statistics.</p>

Revised TEKS (2012): Building to Algebra I Linear Functions, Equations, and Inequalities – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
<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>Solve one-variable, one-step equations and inequalities.</p>
<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 x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations.</p>	<p>Determine if given values make one-variable, two-step equations and inequalities true.</p>	<p>Determine if given values make one-variable, one-step equations or inequalities true.</p>

Revised TEKS (2012): Building to Algebra I Quadratic Functions and Equations – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
Describe and analyze the relationship between a function and its inverse, including restrictions on the domain and range.	Determine domain and range of quadratic functions.			
Write the quadratic function given three specified points in the plane.	Write equations of quadratic functions given the vertex and another point on the graph. Write quadratic functions when given real solutions.			
Write the equation of a parabola given attributes.	Write a quadratic equation in vertex form. Graph quadratic functions and identify key attributes including x -intercepts, y -intercept, zeros, maximum value, minimum value, vertex, and the axis of symmetry.			
Transform a quadratic function in standard form to vertex form to identify the different attributes of the function.	Rewrite a quadratic equation from vertex form to standard form.			
Determine the factors of a polynomial function of degree three and degree four using algebraic methods.	Describe the relationship between linear factors of quadratic expressions and zeros of their associated quadratic functions.			

Revised TEKS (2012): Building to Algebra I Quadratic Functions and Equations – A Vertical Look at Key Concepts and Procedures

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
Determine the factors of a polynomial function of degree three and degree four using algebraic methods.	Describe the relationship between linear factors of quadratic expressions and zeros of their associated quadratic functions.			
Determine the effect on the graph of $f(x) = \sqrt{x}$ when parameter changes are made.	Determine the effects on the graph of the parent function $f(x) = x^2$ when parameter changes are made.			
Analyze the effect on the graph of $f(x) = x^3$, $f(x) = x $, and $f(x) = \frac{1}{x}$ when parameter changes are made.				
Solve quadratic, square root, and cube root equations.	Solve quadratic equations that have real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula.			
Identify extraneous solutions of equations.				
Solve quadratic inequalities.				
Use regression methods available through technology to write a function from a given set of data.	Write, using technology, a quadratic function that provides a reasonable fit to data to estimate solutions and make predictions.			
Predict and make decisions and critical judgments from a given set of data.				

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

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
<p>Graph square root, cubic, 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>Write the domain and range of a function in interval notation, inequalities, and set notation.</p> <p>Determine the effects on key attributes of the graphs of $f(x) = b^x$ and $f(x) = \log_b(x)$ when parameter changes are made.</p> <p>Rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations.</p> <p>Formulate and solve exponential and logarithmic equations that model real-world situations.</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 domain and range of exponential functions.</p> <p>Write exponential functions in the form $f(x) = ab^x$, including those that model growth and decay.</p> <p>Graph exponential functions that model growth and decay and identify key features including y-intercept and asymptote.</p> <p>Interpret the meaning of values a and b in exponential functions of the form $f(x) = ab^x$ in real world problems.</p> <p>Write, using technology, exponential functions that provide a reasonable fit to data and make predictions.</p>			

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

Algebra II	Algebra I	Grade 8	Grade 7	Grade 6
<p>Add, subtract, and multiply complex numbers.</p> <p>Add, subtract, and multiply polynomials.</p> <p>Determine the sum, difference, product, and quotient of polynomial and rational expressions with integral exponents of degree one and degree two.</p> <p>Rewrite radical expressions that contain variables to equivalent forms.</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>Generate equivalent numerical expressions using order of operations.</p> <p>Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.</p> <p>Generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.</p>
<p>Analyze data to select the appropriate model from among, linear, quadratic, and exponential models.</p>	<p>Determine if a relation is a function.</p> <p>Evaluate functions when given elements in their domain.</p> <p>Identify terms within and generalize relationships for arithmetic and geometric sequences.</p>	<p>Identify functions using sets of ordered pairs, tables, mappings, and graphs.</p> <p>Write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using multiple representations.</p>		
<p>Graph and write the inverse of a function using notation such as $f^{-1}(x)$.</p>	<p>Solve literal equations for a specified variable.</p>			