

## Module Correlation Chart—Texas Essential Knowledge and Skills (TEKS)

Texas Essential Knowledge and Skills (TEKS)	Modules
(1) <b>Foundations for functions.</b> The student uses properties and attributes of functions and applies functions to problem situations.	
(A) For a variety of situations, the student identifies the mathematical domains and ranges and determines reasonable domain and range values for given situations.	1
(B) In solving problems, the student collects data and records results, organizes the data, makes scatter plots, fits the curves to the appropriate parent function, interprets the results, and proceeds to model, predict, and make decisions and critical judgements.	1
(2) <b>Foundations for functions.</b> The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations.	
(A) The student uses tools including matrices, factoring, and properties of exponents to simplify expressions and transform and solve equations.	2, 3, 9
(B) The students uses complex numbers to describe the solutions of quadratic equations.	5, 6
(C) The student connects the function notations of $y =$ and $f(x) =$ .	1
(3) <b>Foundations for functions.</b> The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations.	
(A) The students analyzes situations and formulates systems of equations or inequalities in two or more unknowns to solve problems.	2
(B) The students uses algebraic methods, graphs, tables, or matrices, to solve systems of equations and inequalities.	1
(C) For given contexts the student interprets and determines the reasonableness of solutions to system, of equations and inequalities.	1

<b>(4) Algebra and geometry.</b> The student connects algebraic and geometric representations of functions.	
(A) The student identifies and sketches graphs of parent functions, including linear ( $y = x$ ), quadratic ( $y = x^2$ ), square root ( $y = \sqrt{x}$ ), inverse ( $y = 1/x$ ), exponential ( $y = a^x$ ), and logarithmic ( $y = \log ax$ ) functions.	6, 9
(B) The student extends parent functions with parameters such as $m$ in $y = mx$ and describes parameter changes on the graph of parent functions.	2
(C) The student recognizes inverse relationships between various functions.	8
<b>(5) Algebra and geometry.</b> The student knows the relationship between the geometric and algebraic descriptions of conic sections.	
(A) The student describes a conic section, the intersection of a plane or a cone.	7
(B) In order to sketch graphs of conic sections, the student relates simple parameter changes in the equation to corresponding changes in the graph.	7
(C) The student identifies symmetries from graphs of conic sections.	7
(D) The student identifies the conic section from a given equation.	7
(E) The student uses the method of completing the square.	7
<b>(6) Quadratic and square root functions.</b> The student understands that quadratic functions can be represented in different ways and translates among their various representations.	
(A) For given contexts, the student determines the reasonable domain and range value of quadratic functions, as well as interprets and determines the reasonableness of solutions to quadratic equations and inequalities.	6
(B) The student relates representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions.	6
(C) The student determines a quadratic function from its roots or a graph.	6
<b>(7) Quadratic and square root functions.</b> The student interprets and describes the effects of changes in the parameter of quadratic functions in applied and mathematical situations.	
(A) The student uses characteristics of the quadratic parent function to sketch the related graphs and connects between the $y = ax^2 + bx + c$ and the $y = a(x-h)^2 + k$ symbolic representations of quadratic functions.	6
(B) The student uses the parent function to investigate, describe, and predict the effects of changes in $a$ , $h$ , and $k$ on the graphs of $y = a(x-h)^2 + k$ form of a function in applied and purely mathematical situations.	6

(8) <b>Quadratic and square root functions.</b> The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solution in terms of the situation.	6
(A) The student analyzes situations involving quadratic functions and formulates quadratic equations or inequalities to solve problems.	6
(B) The student analyzes and interprets the solutions of quadratic equations using discriminates and solves quadratic equations using the quadratic formula.	6
(C) The student compares and translates between algebraic and graphical solutions of quadratic equations.	6
(D) The student solves quadratic equations and inequalities.	6
(9) <b>Quadratic and square root functions.</b> The student formulates equations and inequalities based on square root functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation.	
(A) The student uses the parent function to investigate, describe, and predict the effects of parameter changes on the graphs of square root functions and describes limitations on the domains and ranges.	6, 8
(B) The student relates representations of square root functions, such as algebraic, tabular, graphical, and verbal descriptions.	6
(C) For given contexts, the student determines the reasonable domain and range values of square root functions, as well as interprets and determines the reasonableness of solutions to square root equations and inequalities.	6
(D) The student solves square root equations and inequalities using graphs, tables, and algebraic methods.	6
(E) The student analyzes situations modeled by square root functions, formulates equations or inequalities, selects a method, and solves problems.	6
(F) The student expresses inverses of quadratic functions using square root functions.	8
(10) <b>Rational functions.</b> The student formulates equations and inequalities based on rational functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations.	
(A) The student uses quotients to describe the graphs of rational functions, describes limitations on the domains and ranges, and examines asymptotic behavior.	4
(B) The student analyzes various representations of rational functions with respect to problem situations.	4

(C) For given contexts, the student determines the reasonable domain and range values of rational functions as well as interprets and determines the reasonableness of solutions to rational equations and inequalities.	4
(D) The student solves rational equations and inequalities using graphs, tables, and algebraic methods.	4
(E) The student analyzes a situation modeled by a rational function, formulates an equation or inequality composed of a linear or quadratic function, and solves the problem.	4
(F) The student uses direct and inverse variation functions as models to make predictions in problem situations.	4
<b>(11) Exponential and logarithmic functions.</b> The student formulates equations and inequalities based on exponential and logarithmic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation.	
(A) The student develops the definition of logarithms by exploring and describing the relationship between exponential functions and their inverses.	9
(B) The student uses the appropriate functions to investigate, describe, and predict the effects of parameter changes on the graphs of exponential and logarithmic functions, describes limitations on the domains and ranges, and examines asymptotic behavior.	9
(C) The student determines the reasonable domains and range values of exponential and logarithmic functions as well as interprets and determines the reasonableness of solutions to exponential and logarithmic equations and inequalities.	9
(D) The student solves exponential and logarithmic equations and inequalities using graphs, tables, and algebraic methods.	9
(E) The student analyzes a situation modeled by an exponential function, formulates an equation or inequality, and solves the problem.	9