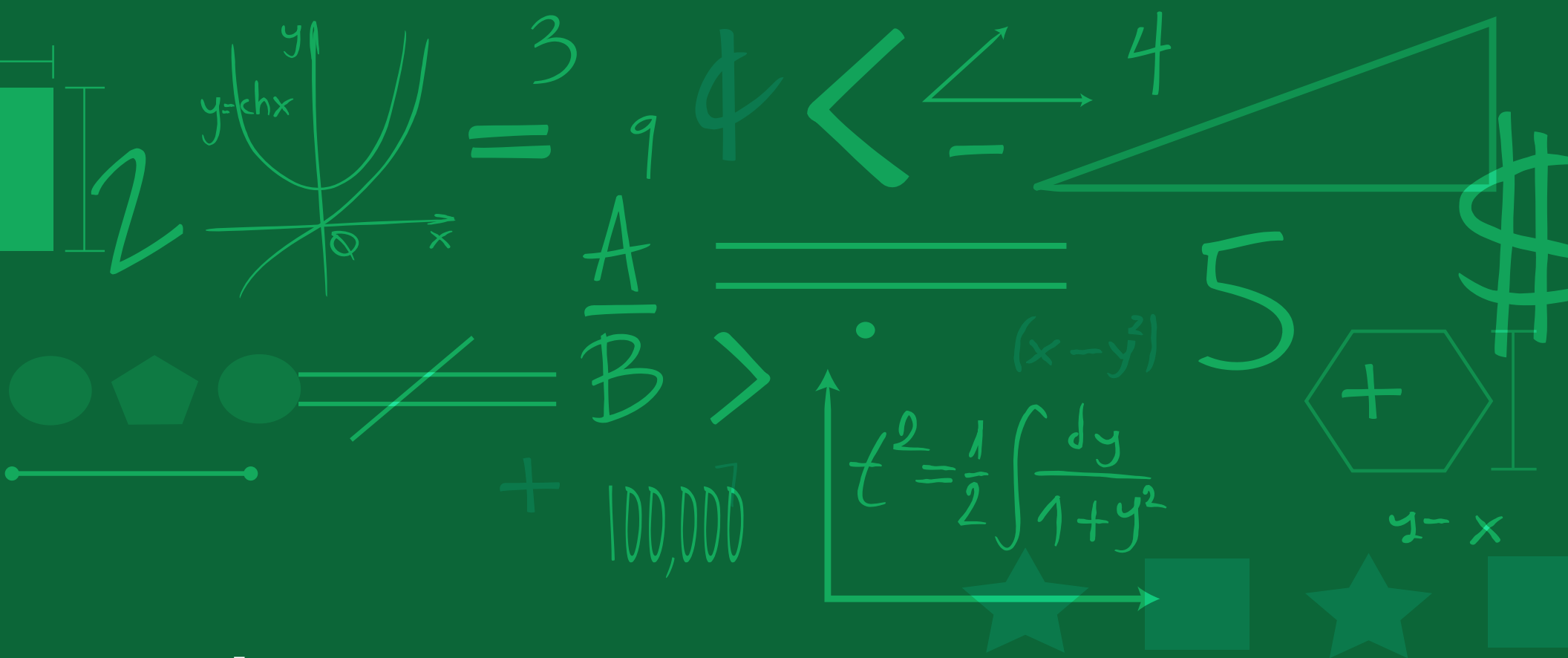

Mathematics TEKS
SUPPORTING INFORMATION

ALGEBRA II

Texas Education Agency

Algebra II – Mathematics

TEKS	Supporting Information
(a) General requirements. Students shall be awarded one-half to one credit for successful completion of this course. Prerequisite: Algebra I.	The TEKS include descriptions of prerequisite coursework. Algebra I is a required prerequisite.
(b) Introduction. (1) The desire to achieve educational excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on fluency and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.	A well-balanced mathematics curriculum includes the Texas College and Career Readiness Standards. A focus on mathematical fluency and solid understanding allows for rich exploration of the key ideas of Algebra II.
(b) Introduction. (2) The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, and number sense to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	This paragraph occurs second in the TEKS, preceding the content descriptions. This highlights the emphasis of student use of the mathematical process standards to acquire and demonstrate mathematical understanding. The concept of generalization and abstraction in the text from 2A(1)(B) included in the introductory paragraphs from elementary TEKS may be considered subsumed in this language. Computer programs in the text from 2A(1)(C) may be included under technology. This introductory paragraph states, "Students will use mathematical relationships to generate solutions and make connections and predictions," instead of the text from 2A(1)(E).
(b) Introduction. (3) In Algebra II, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I. Students will broaden their knowledge of quadratic functions, exponential functions, and systems of equations. Students will study logarithmic, square root, cubic, cube root, absolute value, rational functions, and their related equations. Students will connect functions to their inverses and associated equations and solutions in both mathematical and real-world situations. In addition, students will extend their knowledge of data analysis and numeric and algebraic methods.	Specifics about Algebra II mathematics content is summarized in this paragraph. This summary follows the paragraph about the mathematical process standards. This supports the notion that the TEKS should be learned in a way that integrates the mathematical process standards in an effort to develop fluency. The paragraph also connects the key concepts found in Algebra II to prior content and the Texas College and Career Readiness Standards.
(b) Introduction. (4) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.	The State Board of Education approved the retention of some "such as" statements within the TEKS where needed for clarification of content. The phrases "including" and "such as" should not be considered as limiting factors for the student expectations (SEs) in which they reside.

Additional Resources are available online including

Vertical Alignment Charts
Texas Mathematics Resource Page
Texas College and Career Readiness Standards

TEKS: Mathematical Process Standards.	Supporting Information
2A(1)(A) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to apply mathematics to problems arising in everyday life, society, and the workplace.**	This student expectation (SE) emphasizes application. The opportunities for application have been consolidated into three areas: everyday life, society, and the workplace. This SE, when paired with a content SE, allows for increased relevance through connections within and outside mathematics. *Example*: When paired with 2A(4)(A), the student may be expected to write the quadratic function when given three specified points in the plane and then use this quadratic function to solve a problem arising in everyday life, society, and the workplace.
2A(1)(B) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.**	This process standard applies the same problem-solving model and is included in the TEKS for kindergarten through grade 12. This is the traditional problem-solving process used in mathematics and science. Students may be expected to use this process in a grade appropriate manner when solving problems that can be considered difficult relative to mathematical maturity.
2A(1)(C) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.**	The phrase "as appropriate" indicates that students are assessing which tools and techniques to apply rather than trying only one or all of those listed. *Example:* When paired with 2A(8)(A), the student may be expected to choose the appropriate tool to determine the curve of best fit.
2A(1)(D) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.**	Students may be expected to address three areas: mathematical ideas, reasoning, and implications of these ideas and reasoning. Communication can be through the use of symbols, diagrams, graphs, or language. The phrase "as appropriate" implies that students may be expected to assess which communication tool to apply rather than trying only one or all of those listed. The use of multiple representations includes translating and making connections among the representations. *Example*: When paired with 2A(4)(C), the student may be expected to communicate the relationship between various parameter changes to the square root function using symbols, diagrams, graphs, and language as appropriate.
2A(1)(E) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to create and use representations to organize, record, and communicate mathematical ideas.**	The expectation is that students use representations for three purposes: to organize, record, and communicate mathematical ideas. Representations include verbal, graphical, tabular, and algebraic representations. As students create and use representations, the students will evaluate the effectiveness of the representations to ensure that those representations are communicating mathematical ideas with clarity. *Example*: When paired with 2A(8)(C), students may be expected to create a graph or a table in order to organize the data, determine which model fits, and communicate their results.
2A(1)(F) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to analyze mathematical relationships to connect and communicate mathematical ideas.**	Students may be expected to analyze relationships and form connections with mathematical ideas. Students may form conjectures about mathematical representations based on patterns or sets of examples and non-examples. Forming connections with mathematical ideas extends past conjecturing to include verification through a deductive process. *Example*: When paired with 2A(5)(A), students may be expected to explain the relationship of attributes of the graph of an exponential function to that of its parent.
2A(1)(G) **Mathematical process standards** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.**	The expectation is that students speak and write with precise mathematical language to explain and justify the work. This includes justifying a solution. *Example*: When paired with 2A(4)(G), the student may be expected to justify in precise mathematical language why some results are extraneous.

TEKS: Attributes of Functions and Their Inverses.	Supporting Information
2A(2)(A) **Attributes of functions and their inverses.** The student applies mathematical processes to understand that functions have distinct key attributes and understand the relationship between a function and its inverse. **The student is expected to graph the functions *f(x)*=√*x*, *f(x)*=1/*x*, *f(x)*=x^3, *f(x)*=$\sqrt[3]{x}$, *f(x)*=b^x, *f(x)*=|*x*|, and *f(x)*=$\log_b(x)$ where *b* is 2, 10, and *e*, and, when applicable, analyze the key attributes such as domain, range, intercepts, symmetries, asymptotic behavior, and maximum and minimum given an interval.**	Students may be expected to use key attributes to recognize and sketch graphs. This SE includes the limitations on the domains and ranges for all of the functions listed, including the square root, cube, cube root, exponential, and logarithmic functions. Specificity limits values for "*b*" to 2, 10, and *e* to assist the students in graphing. This limitation on bases in this SE does not limit bases of other SEs. Specificity indicates the use of function notation. Transformations are addressed in other SEs.
2A(2)(B) **Attributes of functions and their inverses.** The student applies mathematical processes to understand that functions have distinct key attributes and understand the relationship between a function and its inverse. **The student is expected to graph and write the inverse of a function using notation such as $f^{-1}(x)$.**	Specificity has been provided to clarify the notation to be used for the inverse of a function. Students may be asked to either find or graph the inverse of a function. Such graphs can be restricted to insure the inverse is also a function.
2A(2)(C) **Attributes of functions and their inverses.** The student applies mathematical processes to understand that functions have distinct key attributes and understand the relationship between a function and its inverse. **The student is expected to describe and analyze the relationship between a function and its inverse (quadratic and square root, logarithmic and exponential), including the restriction(s) on domain, which will restrict its range.**	Specificity is provided to describe and analyze the quadratic and square root relationship and the logarithmic and exponential relationship. Specificity includes the restrictions on the domain and range of inverse functions. Students may be expected to determine other inverses, such as cube and cube root [2A(6)(B)]. Linear inverses are linear, and rational inverses can be rational. SE 2A(5)(C) addresses developing the definition of a logarithm. When 2A(5)(C) is paired with 2A(2)(C), students are rewriting exponential equations to explore the relationship between an exponential function and its inverses.
2A(2)(D) **Attributes of functions and their inverses.** The student applies mathematical processes to understand that functions have distinct key attributes and understand the relationship between a function and its inverse. **The student is expected to use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other.**	Specificity is provided for using the composition of two functions to determine if those functions are inverses of each other. The inclusion of the restricted domain suggests that student may be expected to differentiate between values that map to themselves under the composition of inverse functions and those that do not.

TEKS: Systems of Equations and Inequalities.	Supporting Information
2A(3)(A) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to formulate systems of equations, including systems consisting of three linear equations in three variables and systems consisting of two equations, the first linear and the second quadratic.**	When paired with 2A(1)(A) and (B), students may be expected to analyze situations to formulate equations and inequalities. Specificity includes formulating systems of three equations with three variables. This SE builds on systems of equations from Algebra I [A(2)(I)].
2A(3)(B) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to solve systems of three linear equations in three variables by using Gaussian elimination, technology with matrices, and substitution.**	Specificity is provided to the methods for solving systems of three linear equations to include Gaussian elimination and technology with matrices.
2A(3)(C) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to solve, algebraically, systems of two equations in two variables consisting of a linear equation and a quadratic equation.**	Specificity includes the type of system of equations; in this case, it consists of one linear equation and one quadratic equation. This SE builds on solving systems of two linear equations with two variables from Algebra I [A(3)(F), (G) and A(5)(C)].
2A(3)(D) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to determine the reasonableness of solutions to systems of a linear equation and a quadratic equation in two variables.**	When paired with 2A(1)(B), students may be expected to evaluate the reasonableness of the solution. This SE builds on solving systems of two equations with two variables from Algebra I [A(3)(F), (G) and A(5)(C)].
2A(3)(E) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to formulate systems of at least two linear inequalities in two variables.**	When paired with 2A(1)(A) and (B), students may be expected to analyze situations to formulate inequalities. This SE builds on formulating inequalities from Algebra I [A(2)(H)].
2A(3)(F) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to solve systems of two or more linear inequalities in two variables.**	This SE builds on graphing the solution set of systems of two linear inequalities with two variables from Algebra I [A(3)(H)].
2A(3)(G) **Systems of equations and inequalities.** The student applies mathematical processes to formulate systems of equations and inequalities, use a variety of methods to solve, and analyze reasonableness of solutions. **The student is expected to determine possible solutions in the solution set of systems of two or more linear inequalities in two variables.**	When paired with 2A(1)(B), students may be expected to evaluate the reasonableness of the solution. This SE builds on graphing the solution set of systems of two linear inequalities with two variables from Algebra I [A(3)(H)].

TEKS: Quadratic and Square Root Functions, Equations, and Inequalities.	Supporting Information
2A(4)(A) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to write the quadratic function given three specified points in the plane.**	This SE builds on writing quadratic functions given real solutions and related graphs in Algebra I [A(6)(C)]. This SE specifies that any three points may be provided. Those points may or may not include roots. Quadratics with complex roots may also be included, but the SE restricts to points in the plane. Points may be provided from a table, graph, or verbal description. When paired with 2A(1)(B), students may be expected to analyze quadratic functions, equations, or inequalities in a given situation to solve problems. In Algebra I, students formulate a quadratic function using technology [A(8)(B)].
2A(4)(B) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to write the equation of a parabola using given attributes, including vertex, focus, directrix, axis of symmetry, and direction of opening.**	The use of the word "equation" means that the parabola may open either vertically or horizontally. The equation does need not to be a function when drawn on the coordinate plane. This SE can be thought of as the converse of 2A(4)(D).
2A(4)(C) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to determine the effect on the graph of $f(x) = \sqrt{x}$ when $f(x)$ is replaced by $af(x)$, $f(x) + d$, $f(bx)$, and $f(x - c)$ for specific positive and negative values of a, b, c, and d.**	Specificity indicates the use of function notation and which parameter changes should be applied. Determining the effects of multiple parameter changes to the function is included.
2A(4)(D) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to transform a quadratic function $f(x) = ax^2 + bx + c$ to the form $f(x) = a(x - h)^2 + k$ to identify the different attributes of $f(x)$.**	This SE builds on completing the square by using it as a method to transform a quadratic function [A(8)(A)]. This SE extends transforming a quadratic function in Algebra I from the form $f(x) = a(x - h)^2 + k$ to the form $f(x) = ax^2 + bx + c$ [A(6)(B)]. After transforming the quadratic function, students may be expected to identify attributes such as the vertex, intercepts, axis of symmetry, directrix, and the direction of opening.
2A(4)(E) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to formulate quadratic and square root equations using technology given a table of data.**	When paired with 2A(1)(B), students may be expected to analyze quadratic functions or equations in a given situation to solve problems. In Algebra I, students formulate a quadratic equation using technology [A(8)(B)]. This SE includes specificity regarding the use of technology as well. When paired with 2A(1)(A), students may be expected to analyze real-world situations that are modeled by quadratic and square root functions.

TEKS: Quadratic and Square Root Functions, Equations, and Inequalities.	Supporting Information
2A(4)(F) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve quadratic and square root equations.**	The notion of complex numbers as solutions is subsumed in the term "solve," as solutions may be real, imaginary, or complex. When paired with 2A(1)(B), students may be expected to determine the reasonableness of solutions to quadratic equations. Students may be expected to use the discriminant of a quadratic equation to determine the number and type of roots. In Algebra I, students determine only real solutions to quadratic equations by factoring, taking square roots, completing the square, and applying the quadratic formula [A(8)(A)]. When paired with 2A(1)(D), students are expected to use algebraic, graphical, and tabular methods to solve quadratic equations. When paired with 2A(1)(A), students are expected to analyze real-world situations that are modeled by quadratic and square root functions and develop the equation before solving it.
2A(4)(G) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to identify extraneous solutions of square root equations.**	Reasonableness of solutions includes extraneous solutions. When paired with 2A(1)(A), (B), (D), and (G), students may be expected to determine the reasonableness of values within the domain and range in problem situations presented algebraically, graphically, and in tables.
2A(4)(H) **Quadratic and square root functions, equations, and inequalities.** The student applies mathematical processes to understand that quadratic and square root functions, equations, and quadratic inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve quadratic inequalities.**	This SE extends students' learning of quadratics functions and equations from Algebra I. This SE introduces quadratic inequalities. Inequalities may have real boundary values. When paired with 2A(1)(B), students may be expected to determine the reasonableness of solutions to quadratic inequalities.

TEKS: Exponential and Logarithmic Functions and Equations.	Supporting Information
2A(5)(A) **Exponential and logarithmic functions and equations.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems. **The student is expected to determine the effects on the key attributes on the graphs of $f(x) = b^x$ and $f(x) = \log_b(x)$ where b is 2, 10, and e when $f(x)$ is replaced by $af(x)$, $f(x) + d$, and $f(x - c)$ for specific positive and negative real values of a, c, and d.**	Specificity limits values for "b" to 2, 10, and e to assist the students with graphing. The limitation of the bases in this SE does not limit the bases of the other SEs. Specificity has been added to indicate the use of function notation and specifics parameter changes. Students may be expected to analyze key attributes of the functions where multiple parameter changes have been applied. This SE specifies that key attributes of the function be included. Key attributes include intercepts and asymptotes.
2A(5)(B) **Exponential and logarithmic functions and equations.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems. **The student is expected to formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation.**	This SE specifies that exponential relationships may be written in recursive notation. When paired with 2A(1)(B), students may be expected to formulate logarithmic and exponential equations that could be used to solve problems. Logarithmic or exponential functions may have bases of 2, 10, and e, but are not limited to these values.
2A(5)(C) **Exponential and logarithmic functions and equations.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems. **The student is expected to rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations.**	This SE develops the definition of a logarithm. When paired with 2A(2)(C), students may be expected to rewrite exponential equations to explore the relationship between an exponential function and its inverses. Specificity includes writing corresponding equations when given either a logarithmic or an exponential equation. Logarithmic or exponential functions may have bases of 2, 10, and e, but are not limited to these values.
2A(5)(D) **Exponential and logarithmic functions and equations.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems. **The student is expected to solve exponential equations of the form $y = ab^x$ where a is a nonzero real number and b is greater than zero and not equal to one and single logarithmic equations having real solutions.**	Specificity includes logarithmic equations with real solutions. Logarithmic or exponential functions may have bases of 2, 10, and e, but are not limited to these values. When paired with 2A(1)(B), students may be expected to determine the reasonableness of the solutions to exponential and logarithmic equations. This SE builds on exponential functions from Algebra I where students graph, write, and predict from exponential functions in given situations. This SE introduces solving exponential and logarithmic equations. Students use the properties of logarithms to solve equations in Precalculus [P(5)(G)]. However, students may be expected to solve logarithmic equations for which the solution can be determined without the use of logarithmic properties. When paired with 2A(1)(B), (C), and (D), students may be expected to use graphs, tables, and algebraic methods to solve exponential and logarithmic equations.
2A(5)(E) **Exponential and logarithmic functions and equations.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems. **The student is expected to determine the reasonableness of a solution to a logarithmic equation.**	Specificity includes logarithmic equations with real solutions. Logarithm or exponential functions may have bases of 2, 10, and e, but are not limited to these values. When paired with 2A(1)(A), students may be expected to determine the reasonableness of the solutions to exponential and logarithmic equations in a real-world situation.

TEKS: Cubic, Cube Root, Absolute Value and Rational Functions, Equations, and Inequalities.	Supporting Information
2A(6)(A) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to analyze the effect on the graphs of $f(x) = x^3$ and $f(x) = \sqrt[3]{x}$ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x - c)$, and $f(x) + d$ for specific positive and negative real values of a, b, c, and d.**	Students may be expected to analyze parameter changes on these new functions. Students may be expected to graph and analyze functions where multiple parameter changes have been applied.
2A(6)(B) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve cube root equations that have real roots.**	When paired with 2A(1)(A) and (G), a student may be expected to justify a solution as viable in a real-world situation.
2A(6)(C) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to analyze the effect on the graphs of $f(x) = \|x\|$ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x - c)$, and $f(x) + d$ for specific positive and negative real values of a, b, c, and d.**	Students may be expected to analyze parameter changes on these new functions. Students may be expected to graph and analyze functions where multiple parameter changes have been applied.
2A(6)(D) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to formulate absolute value linear equations.**	Absolute value equations may involve contexts such as margin of error or tolerance.
2A(6)(E) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve absolute value linear equations.**	Extraneous answers are possible.
2A(6)(F) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve absolute value linear inequalities.**	Students may be expected to explore the relationship between absolute value expressions and negative values.
2A(6)(G) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to analyze the effect on the graphs of $f(x) = 1/x$ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x - c)$, and $f(x) + d$ for specific positive and negative real values of a, b, c, and d.**	Students may be expected to analyze the effects of parameter changes on $f(x) = {}^{1}/_{x}$. Specificity includes analyzing changes in the restrictions on the domain and range of a rational function and the changes to the asymptotes. Students may be expected to graph and analyze functions where multiple parameter changes have been applied.
2A(6)(H) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to formulate rational equations that model real-world situations.**	When paired with 2A(1)(B), students may be expected to analyze a situation before formulating an equation to model the situation. This SE is limited to the rational equations composed of linear or quadratic functions based on the degree one and degree two limitations in 2A(7)(F).

TEKS: Cubic, Cube Root, Absolute Value and Rational Functions, Equations, and Inequalities.	Supporting Information
2A(6)(I) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to solve rational equations that have real solutions.**	When paired with 2A(1)(D), students may be expected to use different representations to solve rational equations. When paired with 2A(1)(B), students may be expected to analyze a situation before formulating an equation to model the situation. This SE is limited to the rational equations composed of linear or quadratic functions based on the degree one and degree two limitations in 2A(7)(F). It is also limited to rational functions with real solutions. Extraneous answers are possible.
2A(6)(J) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to determine the reasonableness of a solution to a rational equation.**	To determine reasonableness, students may be expected to use 2A(6)(K), which focuses on vertical asymptotes which serve to restrict the domain of a rational function. The SE is limited to the rational equations composed of linear or quadratic functions based on the degree one and degree two limitations in 2A(7)(F).
2A(6)(K) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to determine the asymptotic restrictions on the domain of a rational function and represent domain and range using interval notation, inequalities, and set notation.**	Students may be expected to factor the denominator of the rational function to determine the restrictions on the domain of the function. When paired with 2A(1)(C), students may be expected to graph rational functions, using technology, to determine the range of the function. Specificity includes types of notations for representing domain and range. This SE focuses on vertical asymptotes which serve to restrict the domain of a rational function, and horizontal asymptotes which can restrict the range. Oblique asymptotes may be considered as well. Students will graph and continue work with rational functions in Precalculus [P(2)(G) and (I)].
2A(6)(L) **Cubic, cube root, absolute value and rational functions, equations, and inequalities.** The student applies mathematical processes to understand that cubic, cube root, absolute value and rational functions, equations, and inequalities can be used to model situations, solve problems, and make predictions. **The student is expected to formulate and solve equations involving inverse variation.**	Students may be expected to model algebraically and formulate equations for inverse variations. Students may be expected to solve equations to make predictions. When paired with 2A(1)(B) and (C), students may be expected to analyze problem situations that involve inverse variations.

TEKS: Number and Algebraic Methods.	Supporting Information
2A(7)(A) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to add, subtract, and multiply complex numbers.**	This SE includes the operations of adding, subtracting, and multiplying complex numbers.
2A(7)(B) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to add, subtract, and multiply polynomials.**	In Algebra I, students are expected to add, subtract, and multiply polynomials of degree one and degree two [A(10)(A) and (B)].
2A(7)(C) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to determine the quotient of a polynomial of degree three and of degree four when divided by a polynomial of degree one and of degree two.**	In Algebra I, students are expected to divide polynomials of degree one and degree two [A(10)(C)]. Methods of division may include long division or synthetic division.
2A(7)(D) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to determine the linear factors of a polynomial function of degree three and of degree four using algebraic methods.**	In Algebra I, students are expected to factor trinomials and binomials with the structure of the difference of two squares [A(10)(D) and (E)]. This SE builds on Algebra I A(10)(D), (E), and (F) by extending factoring to polynomials of degree three and degree four with linear factors. Methods of factoring may include, but are not limited to common monomial factoring, factoring by grouping, or factoring using special products.
2A(7)(E) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to determine linear and quadratic factors of a polynomial expression of degree three and of degree four, including factoring the sum and difference of two cubes and factoring by grouping.**	This SE extends 2A(7)(D) and allows for non-algebraic techniques such as the use of tables and graphs to determine rational roots, which can be removed through division before proceeding to find the other roots.
2A(7)(F) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to determine the sum, difference, product, and quotient of rational expressions with integral exponents of degree one and of degree two.**	Specificity includes the operations of determining the sum, difference, product, and quotient of rational expressions. Operations with rational expressions are used to solve rational equations when using algebraic methods.
2A(7)(G) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to rewrite radical expressions that contain variables to equivalent forms.**	In Algebra I, students are expected to simplify numerical radical expressions including square roots [A(11)(A)].
2A(7)(H) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to solve equations involving rational exponents.**	Radical equations involving variables to a power are included in this SE, since $\sqrt[3]{x^2} = x^{2/3}$.
2A(7)(I) **Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. **The student is expected to write the domain and range of a function in interval notation, inequalities, and set notation.**	This SE builds on an Algebra I skill where students are expected to write the domain and range of quadratic functions using inequalities [A(6)(A)]. Specificity includes interval notation, inequalities, and set notation. Both continuous and discrete functions are subsumed within the term "function." When paired with 2A(1)(B), students may be expected to determine reasonable values for domain and range in given situations. When paired with 2A(1)(A), (B), (D), and (G), students may be expected to determine the reasonableness of domain and range values in problem situations presented algebraically, graphically, and in tables.

TEKS: Data.	Supporting Information
2A(8)(A) **Data**. The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. **The student is expected to analyze data to select the appropriate model from among linear, quadratic, and exponential models.**	Selecting the appropriate model includes fitting a graph of a function to data. When paired with 2A(1)(E) and (F), students maybe expected to collect and organize data as well as make and interpret scatterplots.
2A(8)(B) **Data**. The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. **The student is expected to use regression methods available through technology to write a linear function, a quadratic function, and an exponential function from a given set of data.**	Specificity includes the use of regression methods and technology to write an appropriate model for a given set of data. When paired with 2A(1)(D), students may be expected to use multiple representations of the data to determine which function to use in order to model the data.
2A(8)(C) **Data**. The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. **The student is expected to predict and make decisions and critical judgments from a given set of data using linear, quadratic, exponential models.**	Students may be expected to use the skills from 2A(8)(A) and (B) in order to make decisions and critical judgements. When paired with 2A(1)(A), students may be expected to make decisions and critical judgements based upon real-world data.