

PHASE I: Critical Algebra II TEKS, CCRS, and National Standards

Texas Essential Knowledge and Skills (TEKS) for Algebra II	Texas College and Career Readiness Standards (CCRS)	National College and Career Readiness Standards
<p>2A.1 Foundations for functions. The student uses properties and attributes of functions and applies functions to problem situations. The student is expected to:</p>		
<p>2A.1(A) identify the mathematical domains and ranges of functions and determine reasonable domain and range values for continuous and discrete situations; and</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VI.C.2 Analyze data sets using graphs and summary statistics. VII.A.1 Recognize whether a relation is a function. VII.B.1 Understand and analyze features of a function.</p>	<p>College Board (CB): AI.1.1 Student identifies functions based on their graphical behavior and rates of change, and student describes functions using appropriate notation and terminology.</p> <p>ACT: N4.8 Determine when an expression is undefined.</p> <p>American Diploma Project (ADP): I1.1 Add, subtract, multiply and divide integers, fractions and decimals. J2.2 Determine the domain of a function represented in either symbolic or graphical form. J2.3 Understand functional notation and evaluate a function at a specified point in its domain.</p> <p>Standards for Success (S4S): II.C.4 understand the algebraic language and notation for functions (e.g., domain and range). V.E.1 recognize when the results produced are unreasonable or represent misinformation.</p>

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<p>2A.1(B) collect and organize data, make and interpret scatterplots, fit the graph of a function to the data, interpret the results, and proceed to model, predict, and make decisions and critical judgments.</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. III.C.2 Make connections between geometry, statistics, and probability. IV.D.1 Compute and use measures of center and spread to describe data. IV.D.2 Apply probabilistic measures to practical situations to make an informed decision. VI.C.1 Make predictions and draw inferences using summary statistics. VI.C.2 Analyze data sets using graphs and summary statistics. VI.C.3 Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software. VI.C.4 Recognize reliability of statistical results. VII.A.1 Recognize whether a relation is a function. VII.A.2 Recognize and distinguish between different types of functions. VII.B.1 Understand and analyze features of a function. VII.B.2 Algebraically construct and analyze new functions. VII.C.1 Apply known function models. VII.C.2 Develop a function to model a situation.</p>	<p>CB: MII.4.1 Student formulates questions about a small population that can be answered through collection and analysis of bivariate data, designs related data investigations, and collects data. AI.1.1 Student identifies functions based on their graphical behavior and rates of change, and student describes functions using appropriate notation and terminology. AI.2.1 Student represents linear patterns using expressions, equations, functions, and inequalities and interprets the meanings of these representations, recognizing which are equivalent and which are not. AI.3.1 Student identifies certain nonlinear relationships and classifies them as exponential relationships, quadratic relationships, or relationships of the form $y = k/x$, based on rates of change in tables, symbolic forms, or graphical representations. Student recognizes that multiplying linear factors produces nonlinear relationships. AI.4.1 Student identifies problems that can be addressed through collection and analysis of experimental data, designs and implements simple comparative experiments, and draws appropriate conclusions from the collected data.</p> <p>PC.1.1 Student investigates behavior of functions and their related equations, and student compares and contrasts properties of families of functions and their related equations. PC.6.1 Student assesses association in tables and scatterplots of bivariate numerical data and uses the correlation coefficient to measure linear association. Student develops models for trends in bivariate data using both median-fit lines and least-squares regression lines.</p> <p>ACT: G.6.4 Analyze and draw conclusions based on information from graphs in the coordinate plane.</p> <p>ADP: J4.8 Read information and draw conclusions from graphs; identify properties of a graph that provide useful information about the original problem. L1.5 Create scatter plots, analyze patterns and describe relationships in paired data. L3.4 Construct a scatter plot of a set of paired data, and if it demonstrates a linear trend, use a graphing calculator to find the regression line that best fits this data; recognize that the correlation coefficient measures goodness of fit and explain when it is appropriate to use the regression line to make predictions.</p> <p>S4S: II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each. II.E.1 Recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function). VI.A.1 Represent data in a variety of ways (e.g., scatter plot, line graph and two-way table) and select the most appropriate. VI.A.3 Understand curve-fitting techniques (e.g., median-fit line and regression line) for various applications (e.g., making predictions).</p>

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<p>2A.3 Foundations for functions. 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. The student is expected to:</p>		
<p>2A.3(A) analyze situations and formulate systems of equations in two or more unknowns or inequalities in two unknowns to solve problems.</p>	<p>II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.</p> <p>II.D.1 Interpret multiple representations of equations and relationships.</p> <p>II.D.2 Translate among multiple representations of equations and relationships.</p> <p>VII.A.2 Recognize and distinguish between different types of functions.</p> <p>VII.B.2 Algebraically construct and analyze new functions.</p> <p>VII.C.1 Apply known function models.</p> <p>VII.C.2 Develop a function to model a situation.</p>	<p>CB:</p> <p>AI.2.3 Student constructs, solves, and interprets solutions of linear equations, linear inequalities, and systems of linear equations representing mathematical and real-world contexts.</p> <p>AII.3.1 Student constructs, solves, and interprets solutions of systems of linear equations in two variables representing mathematical and real-world contexts.</p> <p>ACT:</p> <p>E.6.2 Write equations and inequalities that require planning, manipulating, and/or solving.</p> <p>ADP:</p> <p>J3.3 Solve systems of two linear equations in two variables.</p> <p>J3.4 Solve systems of three linear equations in three variables.</p> <p>J5.2 Recognize and solve problems that can be modeled using a system of two equations in two variables, such as mixture problems.</p> <p>S4S:</p> <p>II.C.3 represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs).</p> <p>II.C.5 understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each.</p> <p>II.E.1 recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>
<p>2A.3(B) use algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities; and</p>	<p>I.B.1 Perform computations with real and complex numbers.</p> <p>II.B.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions).</p> <p>II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.</p> <p>II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality.</p> <p>II.D.1 Interpret multiple representations of equations and relationships.</p> <p>II.D.2 Translate among multiple representations of equations and relationships.</p> <p>VI.C.2 Analyze data sets using graphs and summary statistics.</p> <p>VII.B.2 Algebraically construct and analyze new functions.</p>	<p>CB:</p> <p>AI.2.3 Student constructs, solves, and interprets solutions of linear equations, linear inequalities, and systems of linear equations representing mathematical and real-world contexts.</p> <p>AII.3.1 Student constructs, solves, and interprets solutions of systems of linear equations in two variables representing mathematical and real-world contexts.</p> <p>ACT:</p> <p>E5.6 Find solutions to systems of linear equations.</p> <p>G.6.3 Solve problems integrating multiple algebraic and/or geometric concepts.</p> <p>ADP:</p> <p>I1.1 Add, subtract, multiply and divide integers, fractions and decimals.</p> <p>J3.3 Solve systems of two linear equations in two variables.</p> <p>J3.4 Solve systems of three linear equations in three variables.</p> <p>J4.3 Understand the relationship between a solution of a system of two linear equations in two variables and the graphs of the corresponding lines.</p> <p>J4.4 Graph the solution set of a linear inequality and identify whether the solution set is an open or a closed half-plane; graph the solution set of a system of two or three linear inequalities.</p> <p>J5.2 Recognize and solve problems that can be modeled using a system of two equations in two variables, such as</p> <p>S4S:</p> <p>II.B.3 Solve systems of linear equations and inequalities using algebraic and graphical methods (e.g., substitution, elimination, addition and graphing).</p>

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<p>2A.3(C) interpret and determine the reasonableness of solutions to systems of equations or inequalities for given contexts.</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.C.1 Apply known function models. VII.C.2 Develop a function to model a situation.</p>	<p>CB: AI.2.3 Student constructs, solves, and interprets solutions of linear equations, linear inequalities, and systems of linear equations representing mathematical and real-world contexts. AI.3.1 Student constructs, solves, and interprets solutions of systems of linear equations in two variables representing mathematical and real-world contexts.</p> <p>ACT: None</p> <p>ADP: J3.3 Solve systems of two linear equations in two variables. J3.4 Solve systems of three linear equations in three variables.</p> <p>S4S: II.C.4 Understand the algebraic language and notation for functions (e.g., domain and range). V.E.1 Recognize when the results produced are unreasonable or represent misinformation.</p>
<p>2A.4 Algebra and geometry. The student connects algebraic and geometric representations of functions. The student is expected to:</p>		
<p>2A.4(B) extend parent functions with parameters, such as a in $f(x) = a/x$ and describe the effects of the parameter changes on the graph of parent functions; and</p>	<p>II.B.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions). II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. III.B.1 Identify and apply transformations to figures. III.B.3 Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures. VII.A.2 Recognize and distinguish between different types of functions. VII.B.1 Understand and analyze features of a function. VII.B.2 Algebraically construct and analyze new functions.</p>	<p>CB: AI.1.1 Student identifies functions based on their graphical behavior and rates of change, and student describes functions using appropriate notation and terminology. PC.1.1 Student investigates behavior of functions and their related equations, and student compares and contrasts properties of families of functions and their related equations. PC.1.2 Student examines and applies basic transformations of functions and investigates the composition of two functions in mathematical and real-world situations.</p> <p>ACT: G6.2 Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$.</p> <p>ADP: J4.2 Understand the relationship between the coefficients of a linear equation and the slope and x- and y-intercepts of its graph. J4.6 Graph ellipses and hyperbolas whose axes are parallel to the x and y axes and demonstrate understanding of the relationship between their standard algebraic form and their graphical characteristics. J4.7 Graph exponential functions and identify their key characteristics.</p> <p>S4S: II.D.1 Understand basic forms of the equation of a straight line and how to graph the line without the aid of a calculator. II.D.2 Understand the basic shape of a quadratic function and the relationships between the roots of the quadratic and zeroes of the function. II.D.3 Know the basic shape of the graph of exponential and log functions, including exponential decay.</p>

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<p>2A.6 Quadratic and square root functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations. The student is expected to:</p>		
<p>2A.6(A) determine the reasonable domain and range values of quadratic functions, as well as interpret and determine the reasonableness of solutions to quadratic equations and inequalities;</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.B.1 Understand and analyze features of a function.</p>	<p>CB: All.1.2 Student represents, compares, translates among representations, and graphically, symbolically, and tabularly represents, interprets, and solves problems involving quadratic functions.</p> <p>ACT: None</p> <p>ADP: J3.5 Solve quadratic equations in one variable. J4.5 Graph a quadratic function and understand the relationship between its real zeros and the x-intercepts of its graph. J5.3 Recognize and solve problems that can be modeled using a quadratic equation, such as the motion of an object under the force of gravity.</p> <p>S4S: II.B.4 Solve quadratic equations using various appropriate methods while recognizing real solutions. V.E.1 Recognize when the results produced are unreasonable or represent misinformation.</p>

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<p>2A.6(B) relate representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions; and</p>	<p>I.B.1 Perform computations with real and complex numbers. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.A.1 Recognize whether a relation is a function. VII.B.1 Understand and analyze features of a function. VII.C.2 Develop a function to model a situation.</p>	<p>CB: Al.3.2 Student represents and interprets simple exponential and quadratic functions based on mathematical and real-world phenomena using tables, symbolic forms, or graphical representations and solves equations related to these functions. AII.1.2 Student represents, compares, translates among representations, and graphically, symbolically, and tabularly represents, interprets, and solves problems involving quadratic functions.</p> <p>ACT: G6.3 Solve problems integrating multiple algebraic and/or geometric concepts.</p> <p>ADP: J4.5 Graph a quadratic function and understand the relationship between its real zeros and the x-intercepts of its graph. J5.3 Recognize and solve problems that can be modeled using a quadratic equation, such as the motion of an object under the force of gravity.</p> <p>S4S: II.B.4 solve quadratic equations using various appropriate methods while recognizing real solutions. II.C.3 represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs). II.D.2 understand the basic shape of a quadratic function and the relationships between the roots of the quadratic and zeroes of the function. II.E.1 recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>

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<p>2A.7 Quadratic and square root functions. The student interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations. The student is expected to:</p>		
<p>2A.7(A) use characteristics of the quadratic parent function to sketch the related graphs and connect between the $y = ax^2 + bx + c$ and the $y = a(x - h)^2 + k$ symbolic representations of quadratic functions; and</p>	<p>I.B.1 Perform computations with real and complex numbers. II.B.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions). II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. III.B.1 Identify and apply transformations to figures. III.B.3 Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures. VII.B.1 Understand and analyze features of a function. VII.B.2 Algebraically construct and analyze new functions.</p>	<p>CB: All.1.2 Student represents, compares, translates among representations, and graphically, symbolically, and tabularly represents, interprets, and solves problems involving quadratic functions. ACT: G6.2 Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$. ADP: J4.5 Graph a quadratic function and understand the relationship between its real zeros and the x-intercepts of its graph. J4.6 Graph ellipses and hyperbolas whose axes are parallel to the x and y axes and demonstrate understanding of the relationship between their standard algebraic form and their graphical characteristics. S4S: II.D.2 Understand the basic shape of a quadratic function and the relationships between the roots of the quadratic and zeroes of the function.</p>

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<p>2A.8 Quadratic and square root functions. The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:</p>		
<p>2A.8(A) analyze situations involving quadratic functions and formulate quadratic equations or inequalities to solve problems;</p>	<p>II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.A.2 Recognize and distinguish between different types of functions. VII.B.2 Algebraically construct and analyze new functions. VII.C.1 Apply known function models. VII.C.2 Develop a function to model a situation.</p>	<p>CB: AI.3.1 Student identifies certain nonlinear relationships and classifies them as exponential relationships, quadratic relationships, or relationships of the form $y = k/x$, based on rates of change in tables, symbolic forms, or graphical representations. Student recognizes that multiplying linear factors produces nonlinear relationships. AI.3.2 Student represents and interprets simple exponential and quadratic functions based on mathematical and real-world phenomena using tables, symbolic forms, or graphical representations and solves equations related to these functions. AII.1.2 Student represents, compares, translates among representations, and graphically, symbolically, and tabularly represents, interprets, and solves problems involving quadratic functions.</p> <p>ACT: E6.2 Write equations and inequalities that require planning, manipulating, and/or solving.</p> <p>ADP: J5.3 Recognize and solve problems that can be modeled using a quadratic equation, such as the motion of an object under the force of gravity.</p> <p>S4S: II.B.4 Solve quadratic equations using various appropriate methods while recognizing real solutions. II.C.3 Represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs). II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each. II.E.1 Recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>

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<p>2A.8(D) solve quadratic equations and inequalities using graphs, tables, and algebraic methods.</p>	<p>I.B.1 Perform computations with real and complex numbers.</p> <p>II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.</p> <p>II.D.1 Interpret multiple representations of equations and relationships.</p> <p>II.D.2 Translate among multiple representations of equations and relationships.</p> <p>VII.A.2 Recognize and distinguish between different types of functions.</p> <p>VII.B.2 Algebraically construct and analyze new functions.</p> <p>VII.C.1 Apply known function models.</p> <p>VII.C.2 Develop a function to model a situation.</p>	<p>CB:</p> <p>AI.3.2 Student represents and interprets simple exponential and quadratic functions based on mathematical and real-world phenomena using tables, symbolic forms, or graphical representations and solves equations related to these functions.</p> <p>AII.1.2 Student represents, compares, translates among representations, and graphically, symbolically, and tabularly represents, interprets, and solves problems involving quadratic functions.</p> <p>ACT:</p> <p>E4.3 Identify solutions to simple quadratic equations.</p> <p>E5.5 Solve quadratic equations.</p> <p>F3.1 Evaluate quadratic functions, expressed in function notation, at integer values.</p> <p>ADP:</p> <p>J3.5 Solve quadratic equations in one variable.</p> <p>J4.5 Graph a quadratic function and understand the relationship between its real zeros and the x-intercepts of its graph.</p> <p>J5.3 Recognize and solve problems that can be modeled using a quadratic equation, such as the motion of an object under the force of gravity.</p> <p>S4S:</p> <p>II.B.4 solve quadratic equations using various appropriate methods while recognizing real solutions.</p>

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<p>2A.9 Quadratic and square root functions. 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. The student is expected to:</p>		
<p>2A.9(F) analyze situations modeled by square root functions, formulate equations or inequalities, select a method, and solve problems; and</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.C.1 Recognize and use algebraic (field) properties, concepts procedures, and algorithms to solve equations, inequalities, and system of linear equations. II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.A.2 Recognize and distinguish between different types of functions. VII.B.2 Algebraically construct and analyze new functions. VII.C.1 Apply known function models. VII.C.2 Develop a function to model a situation.</p>	<p>CB: AII.2.3 Student interprets and represents rational and radical functions and solves rational and radical equations.</p> <p>ACT: E6.2 Write equations and inequalities that require planning, manipulating, and/or solving.</p> <p>ADP: J1.6 Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified values of their variables.</p> <p>S4S: II.C.3 Represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs). II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each. II.E.1 Recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>

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<p>2A.10 Rational functions. 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 situation. The student is expected to:</p>		
<p>2A.10(F) analyze a situation modeled by a rational function, formulate an equation or inequality composed of a linear or quadratic function, and solve the problem.A31</p>	<p>I.B.1 Perform computations with real and complex numbers. I.C.1 Use estimation to check for errors and reasonableness of solutions. II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.A.2 Recognize and distinguish between different types of functions. VII.B.2 Algebraically construct and analyze new functions. VII.C.1 Apply known function models. VII.C.2 Develop a function to model a situation.</p>	<p>CB: AII.2.3 Student interprets and represents rational and radical functions and solves rational and radical equations. ACT: E6.2 Write equations and inequalities that require planning, manipulating, and/or solving. ADP: J1.5 Add, subtract, multiply, divide and simplify rational expressions. J1.6 Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified values of their variables. S4S: II.C.3 Represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs). II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each. II.E.1 Recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>

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<p>2A.11 Exponential and logarithmic functions. 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. The student is expected to:</p>		
<p>2A.11(A) develop the definition of logarithms by exploring and describing the relationship between exponential functions and their inverses;</p>	<p>I.B.1 Perform computations with real and complex numbers. II.B.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions). II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations. II.D.1 Interpret multiple representations of equations and relationships. II.D.2 Translate among multiple representations of equations and relationships. VII.A.1 Recognize whether a relation is a function. VII.A.2 Recognize and distinguish between different types of functions. VII.B.1 Understand and analyze features of a function. VII.B.2 Algebraically construct and analyze new functions.</p>	<p>CB: AlI.2.1 Student represents geometric or exponential growth with exponential functions and equations, and applies such functions and equations to solve problems in mathematics and real-world contexts. AlI.2.2 Student defines logarithmic functions and uses them to solve problems in mathematics and real-world contexts.</p> <p>ACT: N6.2 Exhibit knowledge of logarithms and geometric sequences.</p> <p>ADP: J2.5 Identify whether a function has an inverse and when functions are inverses of each other; explain why the graph of a function and its inverse are reflections of one another over the line $y=x$. J2.6 Know that the inverse of an exponential function is a logarithm, prove basic properties of a logarithm using properties of its inverse and apply those properties to solve problems. J4.7 Graph exponential functions and identify their key characteristics. J5.5 Recognize and solve problems that can be modeled using an exponential function but whose solution requires facility with logarithms, such as exponential growth and decay problems.</p> <p>S4S: II.A.2 Know how to compose and decompose functions and how to find inverses of basic functions. II.A.6 Understand logarithms (to bases 2, 10 and e) and their properties II.A.8 Know basic theorems of logarithms. II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each.</p>

PHASE I: Critical Algebra II TEKS, CCRS, and National Standards

Texas Essential Knowledge and Skills (TEKS) for Algebra II	Texas College and Career Readiness Standards (CCRS)	National College and Career Readiness Standards
<p>2A.11(F) analyze a situation modeled by an exponential function, formulate an equation or inequality, and solve the problem.</p>	<p>I.B.1 Perform computations with real and complex numbers.</p> <p>I.C.1 Use estimation to check for errors and reasonableness of solutions.</p> <p>II.C.1 Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.</p> <p>II.C.2 Explain the difference between the solution set of an equation and the solution set of an inequality.</p> <p>II.D.1 Interpret multiple representations of equations and relationships.</p> <p>II.D.2 Translate among multiple representations of equations and relationships.</p> <p>VII.A.2 Recognize and distinguish between different types of functions.</p> <p>VII.B.2 Algebraically construct and analyze new functions.</p> <p>VII.C.1 Apply known function models.</p> <p>VII.C.2 Develop a function to model a situation.</p>	<p>CB:</p> <p>AI.3.1 Student identifies certain nonlinear relationships and classifies them as exponential relationships, quadratic relationships, or relationships of the form $y = k/x$, based on rates of change in tables, symbolic forms, or graphical representations. Student recognizes that multiplying linear factors produces nonlinear relationships.</p> <p>AI.3.2 Student represents and interprets simple exponential and quadratic functions based on mathematical and real-world phenomena using tables, symbolic forms, or graphical representations and solves equations related to these functions.</p> <p>AI.2.1 Student represents geometric or exponential growth with exponential functions and equations, and applies such functions and equations to solve problems in mathematics and real-world contexts.</p> <p>ACT:</p> <p>E6.2 Write equations and inequalities that require planning, manipulating, and/or solving.</p> <p>ADP:</p> <p>J2.6 Know that the inverse of an exponential function is a logarithm, prove basic properties of a logarithm using properties of its inverse and apply those properties to solve problems.</p> <p>J4.7 Graph exponential functions and identify their key characteristics.</p> <p>J5.4 Recognize and solve problems that can be modeled using an exponential function, such as compound interest problems.</p> <p>J5.5 Recognize and solve problems that can be modeled using an exponential function but whose solution requires facility with logarithms, such as exponential growth and decay problems.</p> <p>S4S:</p> <p>II.A.6 Understand logarithms (to bases 2, 10 and e) and their properties.</p> <p>II.A.8 Know basic theorems of logarithms.</p> <p>II.C.3 Represent functions, patterns and relationships in different ways (e.g., statements, formulas and graphs).</p> <p>II.C.5 Understand a variety of functions (e.g., polynomial, rational, exponential, logarithmic and trigonometric) and properties of each.</p> <p>II.E.1 Recognize which type of expression best fits the context of a basic application (e.g., linear equation to solve distance/time problems; quadratic equation to explain the motion of a falling object; or compound interest as an exponential function).</p>