| **Absolute Value Functions**  **2A.2 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.  **2A.6 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.  **Connected Knowledge and Skills 2A.7** | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Describing Absolute Value Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  |  |  |  |
| 2A.6(C) 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* |  |  |  |  |
| 2A.7(I) write the domain and range of a function in interval notation, inequalities, and set notation |  |  |  |  |
|  |  |  | | |
| **Solving Absolute Value Equations and Inequalities** |  |  |  |  |
| 2A.6(E) solve absolute value linear equations |  |  |  |  |
| 2A.6(D) formulate absolute value linear equations |  |  |  |  |
| 2A.6(F) solve absolute value linear inequalities |  |  |  |  |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

| **Systems of Equations and Inequalities**  **2A.3 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. | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Systems of Inequalities** |  |  |  |  |
| 2A.3(E) formulate systems of at least two linear inequalities in two variables |  |  |  |  |
| 2A.3(F) solve systems of two or more linear inequalities in two variables |  |  |  |  |
| 2A.3(G) determine possible solutions in the solution set of systems of two or more linear inequalities in two variables |  |  |  |  |
|  |  |  | | |
| **Linear Systems with Three Variables** |  |  |  |  |
| 2A.3(A) 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 |  |  |  |  |
| 2A.3(B) solve systems of three linear equations in three variables by using Gaussian elimination, technology with matrices, and substitution |  |  |  |  |
|  |  |  | | |
| **Quadratic Systems** |  |  |  |  |
| 2A.3(A) 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 |  |  |  |  |
| 2A.3(C) solve, algebraically, systems of two equations in two variables consisting of a linear equation and a quadratic equation |  |  |  |  |
| 2A.3(D) determine the reasonableness of solutions to systems of a linear equation and a quadratic equation in two variables |  |  |  |  |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

| **>> Quadratic and Square Root Functions**  **2A.2 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.  **2A.4 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.  **2A.8 Data.** The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions.  **Connected Knowledge and Skills 2A.7** | **Unit** | **CHECKPOINT** | | |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Inverse Functions** |  |  |  |  |
| 2A.2(C) 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 |  |  |  |  |
| 2A.2(B) graph and write the inverse of a function using notation such as *f* -1 (*x*) |  |  |  |  |
| 2A.2(D) use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other |  |  |  |  |
|  |  |  | | |
| **Quadratic Functions** |  |  |  |  |
| 2A.4(B) write the equation of a parabola using given attributes, including vertex, focus, directrix, axis of symmetry, and direction of opening |  |  |  |  |
| 2A.4(F) solve quadratic and square root equations |  |  |  |  |
| 2A.8(C) predict and make decisions and critical judgments from a given set of data using linear, quadratic, and exponential models |  |  |  |  |
| 2A.4(A) write the quadratic function given three specified points in the plane |  |  |  |  |
| 2A.4(D) 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)* |  |  |  |  |
| 2A.4(E) formulate quadratic and square root equations using technology given a table of data |  |  |  |  |
| 2A.4(H) solve quadratic inequalities |  |  |  |  |
| 2A.7(I) write the domain and range of a function in interval notation, inequalities, and set notation |  | **Data included in “Absolute Value Functions”** | | |
| 2A.8(A) analyze data to select the appropriate model from among linear, quadratic, and exponential models |  |  |  |  |
| 2A.8(B) use regression methods available through technology to write a linear function, a quadratic function, and an exponential function from a given set of data |  |  |  |  |

*>> TEKS clusters typically requiring additional time and focus in the curriculum* (continued)

| **>> Quadratic and Square Root Functions (continued)**  **2A.2 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.  **2A.4 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.  **2A.8 Data.** The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions.  **Connected Knowledge and Skills 2A.7** | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Square Root Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  | **Data included in “Absolute Value Functions”** | | |
| 2A.4(C) determine the effect on the graph of *f(x) =* √*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* |  |  |  |  |
| 2A.4(F) solve quadratic and square root equations |  |  |  |  |
| 2A.4(E) formulate quadratic and square root equations using technology given a table of data |  |  |  |  |
| 2A.4(G) identify extraneous solutions of square root equations |  |  |  |  |
| 2A.7(I) write the domain and range of a function in interval notation, inequalities, and set notation |  | **Data included in “Absolute Value Functions”** | | |
|  |  |  | | |
| **Complex Numbers** |  |  |  |  |
| 2A.7(A) add, subtract, and multiply complex numbers |  |  |  |  |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

*>> TEKS clusters typically requiring additional time and focus in the curriculum*

| **Cube Root, Cubic, and Other Polynomial Functions**  **2A.2 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.  **2A.7 Number and algebraic methods.** The student applies mathematical processes to simplify and perform operations on expressions and to solve equations.  **Connected Knowledge and Skills 2A.6** | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Cubic and Cube Root Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  | **Data included in “Absolute Value Functions”** | | |
| 2A.2(C) 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 |  | **Data included in**  **“Quadratic and Square Root Functions”** | | |
| 2A.2(B) graph and write the inverse of a function using notation such as *f* -1 (*x*) |  |
| 2A.2(D) use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other |  |
| 2A.6(A) analyze the effect on the graphs of *f(x) = x*3 and *f(x)* = 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* |  |  |  |  |
| 2A.6(B) solve cube root equations that have real roots |  |  |  |  |
|  |  |  | | |
| **Polynomial Functions** |  |  |  |  |
| 2A.7(E) 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 |  |  |  |  |
| 2A.7(B) add, subtract, and multiply polynomials |  |  |  |  |
| 2A.7(C) 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 |  |  |  |  |
| 2A.7(D) determine the linear factors of a polynomial function of degree three and of degree four using algebraic methods |  |  |  |  |
|  |  |  | | |
| **Radical Expressions** |  |  |  |  |
| 2A.7(H) solve equations involving rational exponents |  |  |  |  |
| 2A.7(G) rewrite radical expressions that contain variables to equivalent forms |  |  |  |  |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

| **>> Exponential Functions**  **2A.2 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.  **2A.5 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.  **2A.8 Data.** The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions.  **Connected Knowledge and Skills 2A.7** | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Inverse Functions** |  |  |  |  |
| 2A.2(C) 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 |  | **Data included in**  **“Quadratic and Square Root Functions”** | | |
| 2A.2(B) graph and write the inverse of a function using notation such as *f* -1 (*x*) |  |  |  |  |
| 2A.5(C) rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations |  |  |  |  |
|  |  |  | | |
| **Exponential Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  | **Data included in “Absolute Value Functions”** | | |
| 2A.5(A) determine the effects on the key attributes on the graphs of *f(x) = bx* and *f(x) = logb (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* |  |  |  |  |
| 2A.5(D) solve exponential equations of the form *y = abx* 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 |  |  |  |  |
| 2A.8(C) predict and make decisions and critical judgments from a given set of data using linear, quadratic, and exponential models |  | **Data included in**  **“Quadratic and Square Root Functions”** | | |
| 2A.5(B) formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation |  |  |  |  |
| 2A.7(I) write the domain and range of a function in interval notation, inequalities, and set notation |  | **Data included in “Absolute Value Functions”** | | |
| 2A.8(A) analyze data to select the appropriate model from among linear, quadratic, and exponential models |  | **Data included in**  **“Quadratic and Square Root Functions”** | | |
| 2A.8(B) use regression methods available through technology to write a linear function, a quadratic function, and an exponential function from a given set of data |  |

*>> TEKS clusters typically requiring additional time and focus in the curriculum* (continued)

| **>> Exponential Functions (continued)**  **2A.2 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.  **2A.5 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.  **2A.8 Data.** The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions.  **Connected Knowledge and Skills 2A.7** | **Unit** | **CHECKPOINT** | | |
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| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Logarithmic Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  | **Data included in “Absolute Value Functions”** | | |
| 2A.5(A) determine the effects on the key attributes on the graphs of *f(x) = bx* and *f(x) = logb (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* |  |  |  |  |
| 2A.5(D) solve exponential equations of the form *y = abx* 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 |  |  |  |  |
| 2A.5(B) formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation |  |  |  |  |
| 2A.5(E) determine the reasonableness of a solution to a logarithmic equation |  |  |  |  |
| 2A.7(I) write the domain and range of a function in interval notation, inequalities, and set notation |  | **Data included in “Absolute Value Functions”** | | |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

*>> TEKS clusters typically requiring additional time and focus in the curriculum*

| **>> Rational Functions**  **2A.6 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.  **2A.7 Number and algebraic method.** The student applies mathematical processes to understand that exponential and logarithmic functions can be used to model situations and solve problems.  **Connected Knowledge and Skills 2A.2** | **Unit** | **CHECKPOINT** | | |
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| **1** | **2** | **3** |
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| **Process** (Tools to Know) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply math in everyday situations  2A.1(B) use problem-solving models *connected 2A.1(C)* |  |  |  |  |
|  |  |  |  |  |
| **Content** | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| **Describing Rational Functions** |  |  |  |  |
| 2A.2(A) graph the functions *f(x)=*√*x, f(x)=*1*/x, f(x)=x*3*, f(x)=* 3√*x, f(x)=bx, f(x)=|x|,* and *f(x)=logb (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 |  | **Data included in “Absolute Value Functions”** | | |
| 2A.6(G) 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* |  |  |  |  |
| 2A.6(K) determine the asymptotic restrictions on the domain of a rational function and represent domain and range using interval notation, inequalities, and set notation |  |  |  |  |
|  |  |  | | |
| **Simplifying and Solving Rational Equations** |  |  |  |  |
| 2A.6(I) solve rational equations that have real solutions |  |  |  |  |
| 2A.6(L) formulate and solve equations involving inverse variation |  |  |  |  |
| 2A.7(F) determine the sum, difference, product, and quotient of rational expressions with integral exponents of degree one and of degree two |  |  |  |  |
| 2A.6(H) formulate rational equations that model real-world situations |  |  |  |  |
| 2A.6(J) determine the reasonableness of a solution to a rational equation |  |  |  |  |
| 2A.7(C) 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 |  | **Data included in “Cube Root, Cubic, and Other Polynomial Functions”** | | |
|  |  |  |  |  |
| **Process** (Ways to Show) | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(E) create representations  2A.1(F) analyze information *connected 2A.1(D), 2A.1(G)* |  |  |  |  |

*>> TEKS clusters typically requiring additional time and focus in the curriculum*

| **PROCESS STANDARDS: MATHEMATICAL PROCESS STANDARDS** | | **Unit** | **CHECKPOINT** | | |
| --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** |
| 2A.1 The student uses mathematical processes to acquire and demonstrate mathematical understanding. | **Tools to Know** |  |  |  |  |
| **Ways to Show** |  |  |  |  |
|  | |  |  | | |
| **TOOLS TO KNOW** | | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(A) apply mathematics to problems arising in everyday life, society, and the workplace | |  |  |  |  |
| 2A.1(B) 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 | |  |  |  |  |
| 2A.1(C) 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 | |  |  |  |  |
|  | |  |  |  |  |
| **WAYS TO SHOW** | | **Unit** | **CHECKPOINT** | | |
| **1** | **2** | **3** |
| 2A.1(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate | |  |  |  |  |
| 2A.1(E) create and use representations to organize, record, and communicate mathematical ideas | |  |  |  |  |
| 2A.1(F) analyze mathematical relationships to connect and communicate mathematical ideas | |  |  |  |  |
| 2A.1(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication | |  |  |  |  |