Algebra 2/Algebra 2 Honors

Unit 1: Inversely Functional

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.2A ~~graph~~ the functions f(x)= $\sqrt{x}$, f(x)=$\frac{1}{x}$, 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;
2A.2B graph and write the inverse of a function using notation such as $f^{-1}(x)$;
2A.2C 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; and~~
2A.2D use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other.

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:
2A.6C 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.6D formulate absolute value linear equations;
2A.6E solve absolute value linear equations; and
2A.6F solve absolute value linear inequalities.

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:
2A.7I write the domain and range of a function in interval notation, inequalities, and set notation.

The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. The student is expected to:
2A.8A analyze data ~~to select the appropriate model~~ from ~~among~~ linear, ~~quadratic, and exponential~~ models;
2A.8B use regression methods available through technology to write a linear function, ~~a quadratic function, and an exponential function~~ from a given set of data; and
2A.8C predict and make decisions and critical judgments from a given set of data using linear~~, quadratic, and exponential~~ models.

Unit Big Ideas/Learning Targets

- I can determine a reasonable domain and range of mathematical and real-world situations using interval notation, inequalities, and set-builder notation and justify my thinking.
- I can identify a function and its key attributes from the equation and graph using precise mathematical language.
- I can describe and analyze the relationship between a function and its inverse by analyzing mapping diagrams, tables, graphs, and equations using precise mathematical language.

- I can graph the inverse of a function by reflecting a given function over the line y = x by selecting appropriate tools and techniques.
- I can write the inverse of a linear function algebraically using appropriate notation.
- I can determine if two functions are inverses of each other by using the composition of functions and explain my reasoning using logical arguments.
- I can graph an absolute value equation in two variables on the coordinate plane with and without technology.
- I can determine the effects of parameter changes on the graph of an absolute value function in two variables with and without technology using precise mathematical language.
- I can formulate and solve absolute value equations in one variable in mathematical and real-world situations using multiple tools and representations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can solve absolute value inequalities in one variable in mathematical and real-world situations using multiple tools and representations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can justify a set of data is linear using precise mathematical language and use technology to write a linear regression from a set of given data.
- I can predict and make decisions from a given set of data using linear models.

Algebra 2/Algebra 2 Honors

Unit 2: At a Crossroads

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1B 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.1C 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;
2A.1E create and use representations to organize, record, and communicate mathematical ideas;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.3A 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 quadrati~~c;
2A.3B solve systems of three linear equations in three variables by using Gaussian elimination, technology with matrices, and substitution;
2A.3E formulate systems of at least two linear inequalities in two variables;
2A.3F solve systems of two or more linear inequalities in two variables; and
2A.3G determine possible solutions in the solution set of systems of two or more linear inequalities in two variables.

Unit Big Ideas/Learning Targets

- I can formulate systems of equations by organizing given or implied information to make sense of the context.
- I can use the substitution method to solve a system of three linear equations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can use Gaussian elimination to solve a system of three linear equations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can represent a system of three equations using a matrix and solve the system with matrices using technology. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can analyze given information, formulate, and solve a system of three linear equations by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can analyze given information, formulate, and solve problems involving systems of two or more linear inequalities in mathematical and real-world situations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.

Algebra 2/Algebra 2 Honors

Unit 3: It's Hip to be a Square

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1B 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.1C 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;
2A.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.3A 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.3C solve, algebraically, systems of two equations in two variables consisting of a linear equation and a quadratic equation; and
2A.3D determine the reasonableness of solutions to systems of a linear equation and a quadratic equation in two variables.

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:
2A.4A write the quadratic function given three specified points in the plane;
2A.4B write the equation of a parabola using given attributes, including vertex, focus, directrix, axis of symmetry, and direction of opening;
2A.4D 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.4E formulate quadratic ~~and square root~~ equations using technology given a table of data;
2A.4F solve quadratic ~~and square root~~ equations; and
2A.4H solve quadratic inequalities.

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:
2A.7I write the domain and range of a function in interval notation, inequalities, and set notation.

The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. The student is expected to:
2A.8A analyze data to select the appropriate model from among linear, quadratic, ~~and exponential~~ models;
2A.8B use regression methods available through technology to write a linear function, a quadratic function, ~~and an exponential function~~ from a given set of data; and
2A.8C predict and make decisions and critical judgments from a given set of data using linear, quadratic, ~~and exponential~~ models.

Unit Big Ideas/Learning Targets

- I can transform a quadratic function from standard to vertex form, analyze the key attributes of the function, and represent the domain and range in multiple forms using precise mathematical language and notation.
- I can write the equation of a parabola using given attributes and justify my thinking.

- I can write a quadratic function given 3 specified points in the plane and justify my thinking.
- I can analyze and select the appropriate model for linear and quadratic functions from given data in order to predict and make decisions and critical judgments. I can write linear and quadratic functions using technology.
- I can solve a quadratic equation by factoring. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can solve a quadratic equation by taking square roots. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can solve a quadratic equation by using tables and graphs. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can solve a quadratic equation by using the quadratic formula. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can solve a quadratic equation by completing the square. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can analyze given information, formulate, and solve a quadratic equation by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can analyze given information, formulate, and solve a quadratic inequality by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can analyze given information, formulate, and algebraically solve a system of two equations (linear and quadratic) in mathematical and real-world situations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.

Algebra 2/Algebra 2 Honors

Unit 4: Deeply Rooted

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1B 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.1C 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;
2A.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.2A graph the functions f(x)=$\sqrt{x}$, ~~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;
2A.2B graph and write the inverse of a function using notation such as $f^{-1}(x)$; and
2A.2C 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.

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:
2A.4C 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;
2A.4E formulate ~~quadratic and~~ square root equations using technology given a table of data;
2A.4F solve ~~quadratic and~~ square root equations; and
2A.4G identify extraneous solutions of square root equations.

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:
2A.7I write the domain and range of a function in interval notation, inequalities, and set notation.

Unit Big Ideas/Learning Targets

- I can graph square root functions with and without technology, analyze the key attributes, and represent the domain and range in multiple forms using precise mathematical language and notation.
- I can determine the effects of parameter changes on the graph of a square root function with and without technology using precise mathematical language.
- I can analyze situations represented by square root functions in order to make sense of and solve problems. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can describe and analyze the inverse relationship between quadratic and square root functions by graphing, algebraic methods, and composition of functions.
- I can formulate square root equations using technology in order to solve mathematical and real-world problems. I can explain my reasoning using logical arguments and determine reasonableness of solutions.

Algebra 2/Algebra 2 Honors

Unit 5: Radical Relationships

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;

2A.1B 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.1C 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;

2A.1E create and use representations to organize, record, and communicate mathematical ideas;

2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and

2A.1G display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:

2A.2A graph the functions ~~f(x)= $\sqrt{x}$, f(x)= $\frac{1}{x}$,~~ $f(x)=x^3$, $f(x)=\sqrt[3]{x}$, ~~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;

2A.2B graph and write the inverse of a function using notation such as $f^{-1}(x)$;

2A.2C 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; and~~

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:

2A.6A 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;

2A.6B solve cube root equations that have real roots;

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:

2A.7G rewrite radical expressions that contain variables to equivalent forms;

2A.7H solve equations involving rational exponents; and

2A.7I write the domain and range of a function in interval notation, inequalities, and set notation.

Unit Big Ideas/Learning Targets

- I can graph and analyze the key attributes of a cubic function in two variables on the coordinate plane with and without technology. I can determine the effects of parameter changes on the graph of a cubic function in two variables with and without technology using precise mathematical language.
- I can graph and analyze the key attributes of a cube root function in two variables on the coordinate plane with and without technology. I can determine the effects of parameter changes on the graph of a cube root function in two variables with and without technology using precise mathematical language.
- I can graph and write the inverse of cubic and cube root equations.
- I can solve cube root equations in one variable in mathematical and real-world situations using multiple tools and representations. I can explain my reasoning using logical arguments and determine reasonableness of solutions.
- I can rewrite radical expressions that contain variables to equivalent forms.
- I can solve equations involving rational exponents. I can explain my reasoning using logical arguments and determine reasonableness of solutions.

Algebra 2/Algebra 2 Honors

Unit 6: "MANY" Methods

Texas Essential Knowledge and Skills (TEKS)

Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
A2.1A apply mathematics to problems arising in everyday life, society, and the workplace;
A2.1B 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;
A2.1C 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;
A2.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
A2.1E create and use representations to organize, record, and communicate mathematical ideas;
A2.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
A2.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

The student applies mathematical processes to simplify and perform operations on expressions ~~and to solve equations~~. The student is expected to:
A2.7A add, subtract, and multiply complex numbers;
A2.7B add, subtract, and multiply polynomials;
A2.7C 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;
A2.7D determine the linear factors of a polynomial function of degree three and of degree four using algebraic methods;
A2.7E 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;

Unit Big Ideas/Learning Targets

- I can add, subtract, and multiply complex numbers.
- I can add, subtract, and multiply polynomials.
- I can divide polynomials.
- I can factor polynomials using the sum and difference of cubes.
- I can factor polynomials by grouping.
- I can factor polynomials by selecting and using appropriate algebraic methods.

Algebra 2/Algebra 2 Honors

Unit 7: All About That "Base"

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1B 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.1C 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;
2A.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
2A.1E create and use representations to organize, record, and communicate mathematical ideas;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.2A graph the functions ~~$f(x)=\sqrt{x}$, $f(x)=1/x$, $f(x)=x^3$, $f(x)=\sqrt[3]{x}$,~~ $f(x)=b^x$, ~~$f(x)=|x|$~~, 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;~~
2A.2B graph and write the inverse of a function using notation such as $f^{-1}(x)$;
2A.2C 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;~~

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:
A2.5A 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;
A2.5B formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation;
A2.5C rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations;
A2.5D 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; and
A2.5E determine the reasonableness of a solution to a logarithmic equation.

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:
A2.7I write the domain and range of a function in interval notation, inequalities, and set notation.

The student applies mathematical processes to analyze data, select appropriate models, write corresponding functions, and make predictions. The student is expected to:
A2.8A analyze data to select the appropriate model from among linear, quadratic, and exponential models;

A2.8B use regression methods available through technology to write a linear function, a quadratic function, and an exponential function from a given set of data; and
A2.8C predict and make decisions and critical judgments from a given set of data using linear, quadratic, and exponential models.

Unit Big Ideas/Learning Targets

- I can graph exponential functions with and without technology, analyze the key attributes, and represent the domain and range in multiple forms using precise mathematical language and notation.
- I can determine the effects of parameter changes on the graph of an exponential function with and without technology using precise mathematical language.
- I can analyze and select the appropriate model for linear, quadratic, and exponential functions from given data in order to predict and make decisions and critical judgments. I can write exponential functions using technology.
- I can analyze given information, formulate, and solve a basic exponential equation by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can graph logarithmic functions with and without technology, analyze the key attributes, and represent the domain and range in multiple forms using precise mathematical language and notation.
- I can determine the effects of parameter changes on the graph of a logarithmic function with and without technology using precise mathematical language.
- I can rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations.
- I can analyze given information, formulate, and solve a single logarithmic equation by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can describe and analyze the inverse relationship between exponential and logarithmic functions by graphing and algebraic methods.

Algebra 2/Algebra 2 Honors

Unit 8: Keep Calm and Be Rational

Texas Essential Knowledge and Skills (TEKS)

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
2A.1A apply mathematics to problems arising in everyday life, society, and the workplace;
2A.1B 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.1C 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;
2A.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
2A.1E create and use representations to organize, record, and communicate mathematical ideas;
2A.1F analyze mathematical relationships to connect and communicate mathematical ideas; and
2A.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

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:
2A.2A graph the functions ~~$f(x)=\sqrt{x}$,~~ $f(x)=1/x$, ~~$f(x)=x^3$, $f(x)=\sqrt[3]{x}$, $f(x)=b^x$, $f(x)=|x|$, 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;~~

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:
A2.6G 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;
A2.6H formulate rational equations that model real-world situations;
A2.6I solve rational equations that have real solutions;
A2.6J determine the reasonableness of a solution to a rational equation;
A2.6K determine the asymptotic restrictions on the domain of a rational function and represent domain and range using interval notation, inequalities, and set notation; and
A2.6L formulate and solve equations involving inverse variation.

The student applies mathematical processes to simplify and perform operations on expressions and to solve equations. The student is expected to:
A2.7F determine the sum, difference, product, and quotient of rational expressions with integral exponents of degree one and of degree two;
A2.7I write the domain and range of a function in interval notation, inequalities, and set notation.

Unit Big Ideas/Learning Targets

- I can graph rational functions with and without technology, analyze the key attributes, and represent the domain and range in multiple forms using precise mathematical language and notation.
- I can determine the effects of parameter changes on the graph of a rational function with and without technology using precise mathematical language.
- I can add and subtract rational expressions in mathematical or real-world problems and explain why they are equivalent using precise mathematical language.
- I can multiply and divide rational expressions in mathematical or real-world problems and explain why they are equivalent using precise mathematical language.
- I can analyze given information, formulate, and solve a rational equation by selecting a method in mathematical and real-world situations. I can analyze and justify the efficiency of my process and evaluate my solution for reasonableness.
- I can formulate and solve equations involving inverse variation. I can explain my reasoning using logical arguments and determine reasonableness of solutions.