Advanced Algebra II
Curriculum

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. New Jersey's academic standards have laid the foundation for local district curricula that is used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages**

The most recent review and revision of the NJSLS standards occurred in 2023, and these were to be implemented starting in the Fall of 2024.

Lower Cape May Regional School District - ALGEBRA II Curriculum	
Content Area: Mathematics	
Course Title: Advanced Algebra II	**Grade level: 10 – 12**
Unit 1: Linear Functions, Quadratic Functions, Quadratic Equations & Complex Numbers	**September - December**
Unit 2: Polynomial Functions, Rational Exponents & Radical Functions	**January - April**
Unit 3: Exponential & Logarithmic Functions, Rational Functions	**May - June**
Date Created:	**Board Approved on:**
8/13/2025	

Lower Cape May Regional School District - ALGEBRA II Curriculum
Unit 1 Overview

Content Area: Mathematics

Unit Title: Linear & Quadratic Functions, Quadratic Equations & Complex Numbers

Target Course/Grade Level: 10 – 12

Unit Summary:

In Unit 1:

- Identify families of functions
- Understand the concept of function and use function notation.
- Build a function that models a relationship between two quantities.
- Describe & write transformations of parent functions (linear & quadratic)
- Write equations of linear functions & find lines of best fit
- Solve systems of equations in three variables algebraically
- Identify properties of parabolas (vertex, axis of symmetry, focus, directrix, etc.)
- Find maximum & minimum values of quadratic functions
- Graph quadratic functions in standard from, vertex form, intercept form
- Write equations of parabolas & quadratic functions (in standard form, vertex form, & intercept form)
- Solve quadratic equations by graphing, algebraically, using square roots, by completing the square, & using the Quadratic Formula
- Analyze the discriminant to determine the number & type of solutions
- Define & use the imaginary unit "i"
- Perform arithmetic operations with complex numbers
- Find complex solutions & zeros
- Solve systems of nonlinear equations
- Graph quadratic inequalities in two variables
- Solve quadratic inequalities in one variable
- Solve real life problems & write equations (linear & quadratic) to model data sets

Interdisciplinary Connections:

- Projectile motion
- Solar energy (parabolic mirrors)
- Electrical circuits (complex numbers)

21st Century Themes, Skills, and Standards:

CRP2 - Apply appropriate academic and technical skills.
CRP4 - Communicate clearly and effectively and with reason.
CRP8- Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11- Use technology to enhance productivity.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HSF-BF.A.1b	Combine standard function types using arithmetic operations.
HSF-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
HSF-BF.B.3	Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), …, f(x + k) for specific values of k (both positive and negative); … Experiment with cases & illustrate an explanation of the effects on the graph using technology.
HSF-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs & tables in terms of the quantities, & sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
HSF-IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
HSF-IF.C.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
HSF-IF.C.8a	Use the process of factoring & completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, & interpret these in terms of a context.

HSF-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, … or by verbal descriptions).
HSS-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
HSS-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
HSS-ID.B.6a	Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.
HSS-ID.B.6b	Informally assess the fit of a function by plotting and analyzing residuals, including with the use of technology.
HSN-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
HSN-CN.A.1	Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form *a* + *bi* with *a* & *b* real.
HSN-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, & distributive properties to add, subtract, & multiply complex numbers.
HSN-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.
HSA-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
HSA-CED.A.2	Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels & scales.
HSA-REI.B.4b	Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions & write them as $a \pm bi$ for real numbers *a* & *b*.
HSA-REI.C.6	Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables. Include 3 x 3 systems.
HSA-REI.C.7	Solve a simple system consisting of a linear equation & a quadratic equation in two variables algebraically & graphically.

HSA-REI.D.1	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) & y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

Unit Enduring Questions:

- What are the characteristics of the basic parent functions?
- How do the graphs of y = f(x) + k, y = f(x-h), & y = - f(x) compare to the graph of the parent function f?
- How can you use a linear function to model & analyze a real-life situation?
- How can you determine the number of solutions of a linear system?
- How do the constants *a*, *h*, & *k* affect the graph of the quadratic function $g(x) = a(x-h)^2 + k$?
- What type of symmetry does the graph of $f(x) = a(x-h)^2 + k$ have & how can you describe this symmetry?
- How can you use a quadratic function to model a real-life situation?
- How can you use the graph of a quadratic equation to determine the number of real solutions of the equation?
- What are the subsets of the set of complex numbers?
- How can you complete the square for a quadratic expression?
- How can you solve a nonlinear system of equations?
- How can you solve a quadratic inequality?

Unit Enduring Understandings:

- Solve simple systems consisting of a linear and quadratic equation in two variables algebraically and graphically.
- Solve algebraically a system of three linear equations.
- Identify families of functions & describe transformations of parent functions.
- Write functions representing combinations of transformations.
- Write equations of linear functions & find lines of best fit.
- Solve systems of linear equations in three variables algebraically.
- Identify properties of parabolas, write equations of parabolas, & graph quadratic functions.
- Solve quadratic equations by graphing & algebraically.
- Define & use the imaginary unit *i*
- Add, subtract, and multiply complex numbers.
- Find complex solutions & zeros.
- Solve quadratic equations by taking square roots, completing the square, quadratic formula, and factoring.
- Write quadratic functions in vertex form.
- Analyze the discriminant to determine the number & type of solutions.
- Solve systems of nonlinear equations.
- Graph quadratic inequalities in two variables.
- Solve quadratic inequalities in one variable.

Unit Objectives: ***Students will know….***	**Unit Objectives:** ***Students will be able to…...***
● How to solve systems consisting of linear/ quadratic equations & inequalities in two/three variables algebraically and graphically. ● How to identify families of functions & describe transformations of parent functions. ● How to write functions representing combinations of transformations. ● How to write equations of linear functions & find lines of best fit. ● Properties of parabolas, how to write equations of parabolas, & graph quadratic functions. ● How to solve quadratic equations by graphing & algebraically. ● How to define & use the imaginary unit *i* ● How to add, subtract, and multiply complex numbers. ● How to find complex solutions & zeros. ● How to solve quadratic equations by taking square roots, completing the square, quadratic formula, and factoring. ● How to write quadratic functions in vertex form. ● How to analyze the discriminant to determine the number & type of solutions. ● How to graph quadratic inequalities in two variables. ● How to solve quadratic inequalities in one variable.	● Solve simple systems consisting of a linear and quadratic equation in two variables algebraically and graphically. ● Solve algebraically a system of three linear equations. ● Identify families of functions & describe transformations of parent functions. ● Write functions representing combinations of transformations. ● Write equations of linear functions & find lines of best fit. ● Solve systems of linear equations in three variables algebraically. ● Identify properties of parabolas, write equations of parabolas, & graph quadratic functions. ● Solve quadratic equations by graphing & algebraically. ● Define & use the imaginary unit *i* ● Add, subtract, and multiply complex numbers. ● Find complex solutions & zeros. ● Solve quadratic equations by taking square roots, completing the square, quadratic formula, and factoring. ● Write quadratic functions in vertex form. ● Analyze the discriminant to determine the number & type of solutions. ● Solve systems of nonlinear equations. ● Graph quadratic inequalities in two variables. ● Solve quadratic inequalities in one variable.

Lower Cape May Regional School District - ALGEBRA II Curriculum
Unit 2 Overview

Content Area: Mathematics

Unit Title: Polynomial Functions, Rational Exponents & Radical Functions

Target Course/Grade Level: 10 – 12

Unit Summary:

In Unit 2:

- Identify polynomial functions
- Graph polynomial functions using tables, end behavior & x-intercepts
- Add, subtract, multiply, & divide polynomials
- Use Pascal's Triangle to expand binomials
- Use long division to divide polynomials
- Use synthetic division to divide polynomials by binomials of the form $x - k$
- Use the Remainder Theorem
- Factor polynomials & use the Factor Theorem
- Find solutions of polynomial equations & zeros of polynomial functions
- Use the Rational Root Theorem
- Use the Irrational Conjugates Theorem
- Use the Fundamental Theorem of Algebra
- Use Descartes' Rule of Signs
- Describe & write transformations of polynomial functions
- Find turning points & identify local maximums & minimums of graphs of polynomial functions
- Identify even & odd functions
- Write polynomial functions for sets of points & using finite differences
- Use technology to find models for data sets
- Find nth roots of numbers & solve equations using nth roots
- Evaluate expressions with rational exponents
- Use properties of rational exponents to simplify expressions with rational exponents
- Use properties of radicals to simplify & write radical expressions in simplest form, including algebraic radicals
- Graph radical functions & write transformations of radical functions
- Graph parabolas & circles
- Solve radical equations & inequalities, solve equations containing rational exponents
- Find & verify inverses of nonlinear functions
- Solve real-life problems using inverse functions

Interdisciplinary Connections:

- Hooke's Law,
- Heartbeat rates
- Sustained wind velocity (hurricane)
- Hang time

21st Century Themes, Skills, and Standards:

CRP2 - Apply appropriate academic and technical skills.
CRP4 - Communicate clearly and effectively and with reason.
CRP8- Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11- Use technology to enhance productivity.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HSA-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, & multiplication; add, subtract, & multiply polynomials.
HSA.APR.B.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
HSA-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, & use the zeros to construct a rough graph of the function defined by the polynomial.
HSA-APR.D.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x) …
HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels & scales.
HSA.REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method - for simple rational or radical equations.
HSA.REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*
HSF-BF.B.3	Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), …, f(x + k) for specific values of k (both positive and negative); … Experiment with cases & illustrate an explanation of the effects on the graph using technology.

HSF-BF.B.4a	Solve an equation of the form f(x) = c for a simple function *f* that has an inverse & write an expression for the inverse.
HSF-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
HSF-IF.C.7c	Graph polynomial functions, … showing end behavior
HSN-CN.C.9	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
HSN-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
HSN-RN.A.2	Rewrite expressions involving radicals & rational exponents using the properties of exponents.
HSN-RN.A.3	Simplify radicals, including algebraic radicals

Unit Enduring Questions:

- What are some common characteristics of the graphs of cubic & quartic polynomial functions?
- How can you cube a binomial?
- How can you use the factors of a cubic polynomial to solve a division problem involving the polynomial?
- How can you factor a polynomial?
- How can you determine whether a polynomial equation has a repeated solution? Imaginary solutions?
- How can you transform the graph of a polynomial function?
- How many turning points can the graph of a polynomial function have?
- How can you find a polynomial model for real-life data?
- How can you use a rational exponent to represent a power involving a radical?
- How can you use properties of exponents to simplify products & quotients of radicals?
- How can you identify the domain & range of a radical function?
- How can you solve a radical equation?

Unit Enduring Understandings:

- Apply the Remainder Theorem to determine the factors of a polynomial.
- Use long division & synthetic division to divide polynomials, & to find roots of polynomials.
- Add, subtract, multiply, & divide polynomials
- Use an appropriate factoring technique to factor polynomials. Explain the relationship between zeros and factors of polynomials, and use the zeros to construct a rough graph of the function defined by the polynomial.
- Graph polynomial functions from equations; identify zeros when suitable factorizations are available; show key features and end behavior.
- Use the Fundamental Theorem of Algebra & Descartes' Rule of Signs
- Describe & write transformations of polynomial functions.
- Identify even & odd functions.
- Write polynomial functions for sets of points & using finite differences.
- Use technology to find models for data sets.
- Find *n*th roots & solve equations using *n*th roots.
- Evaluate expressions with rational exponents.
- Use properties of rational exponents & radicals to simplify expressions.
- Solve simple rational and radical equations in one variable, use them to solve problems and

• How can you sketch the graph of the inverse of a function?	show how extraneous solutions may arise. Create simple rational equations in one variable and use them to solve problems. • For radical functions, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. • Find & verify inverses of nonlinear functions, solve real-life problems using inverse functions.
Unit Objectives: ***Students will know….*** • Polynomial division: For a polynomial $p(x)$ and a number a: $p(a) = 0$ if and only if $(x – a)$ is a factor of $p(x)$ $(x – a)$ is a factor of $p(x)$ if and only if $p(a) = 0$ • Factors of polynomials can be used to identify zeros to be used to develop a rough graph of the polynomial function. • Factors of polynomials can be used to identify zeros to be used to develop a rough graph of the polynomial function. • Polynomial identities can be used to describe numerical relationships. • Rational expressions can be written in different forms. • Inverse relationships exist between roots and powers. • Extraneous solutions do not result in true statements. • A radical function is any function that contains a variable inside a root. • Any point on a parabola is equidistant between the focus and the directrix. • Solutions to complex systems of nonlinear functions can be approximated graphically.	**Unit Objectives:** ***Students will be able to…...*** • use the Remainder Theorem to determine factors of a polynomial. • Factor polynomials. • Use the zeros of the polynomial to create rough graph. • Graph a polynomial function given its equation. • Identify zeros from the graph and using an appropriate factoring technique. • Use technology to graph and describe key features of the graph for complicated cases. • Write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$. • Use inspection, factoring and long division to rewrite rational expressions. • Find nth roots & solve equations using nth roots. • Identify even & odd functions. • Use the Fundamental Theorem of Algebra & Descartes' Rule of Signs • Evaluate expressions with rational exponents. • Use properties of rational exponents & radicals to simplify expressions. • Use the inverse relationship between roots and powers when solving radical equations. • Identify any extraneous solutions. • Interpret key features of radical functions from graphs and tables in the context of the problem. • Graph radical functions • Identify intercepts and intervals where function is increasing/decreasing. • Determine the practical domain of a radical function.

	● Determine key features including intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maxima and minima; symmetries; end behavior.

Lower Cape May Regional School District - ALGEBRA II Curriculum
Unit 3 Overview

Content Area: Mathematics

Unit Title: Exponential & Logarithmic Functions, Rational Functions

Target Course/Grade Level: 10 - 12

Unit Summary:

In Unit 3:

- Graph exponential growth & decay functions
- Use exponential models to solve real-life problems.
- Define & use the natural base *e*, graph natural base functions.
- Use inverse properties of logarithmic & exponential functions.
- Graph logarithmic functions
- Transform graphs of logarithmic & exponential functions, write transformations of logarithmic/exponential functions.
- Use the properties of logarithms to evaluate logarithms.
- Use the properties of logarithms to expand or condense logarithmic expressions.
- Use the change-of-base formula to evaluate logarithms.
- Solve exponential & logarithmic equations & inequalities.
- Classify data sets.
- Write exponential functions.
- Use technology to find exponential & logarithmic models.
- Classify direct & inverse variation, write inverse variation equations.
- Graph rational functions, translate simple rational functions.
- Simplify rational expressions.
- Add, subtract, multiply, & divide rational expressions.
- Rewrite rational expressions & graph the related function.
- Simplify complex fractions.
- Solve rational equations (by cross multiplying, by using the least common denominator)
- Use inverses of rational functions.

Interdisciplinary Connections:

- Newton's Law of Cooling
- Compounded Interest
- Population Growth
- Value depreciation
- Earthquake magnitude
- Sound intensity/loudness – the Doppler effect

21st Century Themes, Skills, and Standards:

CRP2 - Apply appropriate academic and technical skills.
CRP4 - Communicate clearly and effectively and with reason.
CRP8- Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11- Use technology to enhance productivity.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HSA-APR.D.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x) …
HSA-APR.D.7	Understand that rational expressions form a system analogous to the rational numbers, closed under …multiplication, and division by a nonzero rational expression; … multiply, and divide rational expressions.
HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
HSA-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
HSA-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method - for simple rational or radical equations.
HSA-REI.A.2	Solve simple rational … equations in one variable, & give examples showing how extraneous solutions may arise.
HSA-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.

HSA-SSE.B.3c	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression … c. Use the properties of exponents to transform expressions for exponential functions.
HSF-BF.B.3	Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), …, f(x + k) for specific values of k (both positive and negative); … Experiment with cases & illustrate an explanation of the effects on the graph using technology.
HSF-BF.B.4a	Solve an equation of the form f(x) = c for a simple function *f* that has an inverse & write an expression for the inverse.
HSF-IF.C.7e	Graph exponential & logarithmic functions, showing intercepts & end behavior.
HSF-IF.C.8b	Use the properties of exponents to interpret expressions for exponential functions.
HSF-IF.C.9	Compare properties of two functions (exponential or logarithmic) each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
HSF-LE.A.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, & d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
HSF-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.

Unit Enduring Questions:	**Unit Enduring Understandings:**
● What are some of the characteristics of the graph of an exponential function? ● What are some of the characteristics of the graph of a logarithmic function? ● How can you transform the graphs of exponential & logarithmic functions? ● How can you use the properties of exponents to derive properties of logarithms? ● How can you solve exponential & logarithmic equations? ● How can you recognize polynomial, exponential, & logarithmic models? ● How can you recognize when two quantities vary directly or inversely? ● What are some of the characteristics of the graph of a rational function? ● How can you determine the excluded values in a product or quotient of two rational expressions? ● How can you determine the domain of the sum or difference of two rational expressions? ● How can you solve a rational equation?	● Graph exponential growth & decay functions ● Use exponential models to solve real-life problems. ● Define & use the natural base *e*, graph natural base functions. ● Use inverse properties of logarithmic & exponential functions. ● Graph logarithmic functions ● Use the properties of logarithms to evaluate logarithms. ● Use the properties of logarithms to expand or condense logarithmic expressions. ● Use the change-of-base formula to evaluate logarithms. ● Solve exponential & logarithmic equations & inequalities. ● Write exponential functions. ● Use technology to find exponential & logarithmic models. ● Graph rational functions ● Simplify rational expressions. ● Add, subtract, multiply, & divide rational expressions. ● Rewrite rational expressions & graph the related function. ● Simplify complex fractions. ● Solve rational equations (by cross multiplying, by using the least common denominator) ● Use inverses of rational functions.

Unit Objectives: ***Students will know….***	**Unit Objectives:** ***Students will be able to…...***
● How to graph exponential growth & decay functions ● How to use exponential models to solve real-life problems. ● How to define & use the natural base *e*, graph natural base functions ● How to use inverse properties of logarithmic & exponential functions ● How to graph logarithmic functions ● How to transform graphs of logarithmic & exponential functions, write transformations of logarithmic/exponential functions. ● How to use the properties of logarithms to evaluate logarithms ● How to use the properties of logarithms to expand or condense logarithmic expressions ● How to use the change-of-base formula to evaluate logarithms. ● How to solve exponential & logarithmic equations & inequalities ● How to classify data sets ● How to write exponential functions ● How to use technology to find exponential & logarithmic models ● How to classify direct & inverse variation, write inverse variation equations. ● How to graph rational functions, translate simple rational functions. ● How to simplify rational expressions ● How to add, subtract, multiply, & divide rational expressions ● How to rewrite rational expressions & graph the related function. ● How to simplify complex fractions ● How to solve rational equations (by cross multiplying, by using the least common denominator) ● How to use inverses of rational functions	● Graph exponential growth & decay functions ● Use exponential models to solve real-life problems. ● Define & use the natural base *e*, graph natural base functions. ● Use inverse properties of logarithmic & exponential functions. ● Graph logarithmic functions ● Transform graphs of logarithmic & exponential functions, write transformations of logarithmic/exponential functions. ● Use the properties of logarithms to evaluate logarithms. ● Use the properties of logarithms to expand or condense logarithmic expressions. ● Use the change-of-base formula to evaluate logarithms. ● Solve exponential & logarithmic equations & inequalities. ● Classify data sets. ● Write exponential functions. ● Use technology to find exponential & logarithmic models. ● Classify direct & inverse variation, write inverse variation equations. ● Graph rational functions, translate simple rational functions. ● Simplify rational expressions. ● Add, subtract, multiply, & divide rational expressions. ● Rewrite rational expressions & graph the related function. ● Simplify complex fractions. ● Solve rational equations (by cross multiplying, by using the least common denominator) ● Use inverses of rational functions.

Lower Cape May Regional School District - ALGEBRA II Curriculum
Evidence of Learning

Specific Formative Assessments Utilized in Daily Lessons:

- Misconception check, warm-up, student conference, observation, self-assessment, quiz, Think-Pair-Share/Turn to Your Partner, oral questioning
- Big Ideas assessments

Summative Assessment Utilized throughout Units:

- QBA's
- Benchmarks: Big Ideas Quizzes & Tests, Big Ideas online assessments

Modifications for ELL's, Special Education, 504, and Gifted and Talented Students:

Teacher tutoring
Peer tutoring
Cooperative Learning Groups
Modified Assignments
Differentiated Instruction
Response to Intervention (www.help4teachers.com)
Follow all IEP and 504 modifications

Teacher Notes:

- As required by the NJ Department of Education, teachers in all content areas will integrate the 21st Century Life and Careers Standards. As the NJDOE indicates, "Providing New Jersey students with the life and career skills needed to function optimally within this dynamic context is a critical focus and organizing principle of K-12 public education. New Jersey has both an obligation to prepare its young people to thrive in this environment, and a vested economic interest in grooming an engaged citizenry made up of productive members of a global workforce that rewards innovation, creativity, and adaptation to change." The links below indicate the CPIs for grade ranges and need to be addressed throughout the units of study:

  Life and Career Standards

- As indicated in the NJSLS, standards and interdisciplinary connections will be integrated throughout content area curriculum. Links to relevant content standards can be found below:

HSA.SSE.A.1, HSA.SSE.A.2, HSA.SSE.B.3, HSA.SSE.B.4, HSA.APR.A.1, HSA.APR.B.2, HSA.APR.B.3, HSA.APR.C.4, HSA.APR.C.5, HSA.APR.D.6, HSA.APR.D.7, HSA.CED.A.1, HSA.CED.A.2, HSA.CED.A.3, HSA.CED.A.4, HSA.REI.A.1, HSA.REI.A.2, HSA.REI.B.3, HSA.REI.B.4, HSA.REI.C.5, HSA.REI.C.6, HSA.REI.C.7, HSA.REI.C.8, HSA.REI.C.9, HSA.REI.D.10, HSA.REI.D.11, HSA.REI.D.12, HSF.IF.A.1, HSF.IF.A.2, HSF.IF.A.3, HSF.IF.B.4, HSF.IF.B.5, HSF.IF.B.6, HSF.IF.C.7, HSF.IF.C.8, HSF.IF.C.9, HSF.BF.A.1, HSF.BF.A.2, HSF.BF.B.3, HSF.BF.B.4, HSF.BF.B.5, HSF.LE.A.1, HSF.LE.A.2, HSF.LE.A.3, HSF.LE.A.4, HSF.LE.B.5, HSF.TF.A.1, HSF.TF.A.1, HSF.TF.A.2, HSF.TF.A.3, HSF.TF.A.4, HSF.TF.B.5, HSF.TF.B.6, HSF.TF.B.7, HSF.TF.C.8, HSF.TF.C.9, HSS.ID.A.1, HSS.ID.A.2, HSS.ID.A.3, HSS.ID.A.4, HSS.ID.B.5, HSS.ID.B.6, HSS.ID.C.7, HSS.ID.C.8, HSS.ID.C.9, HSS.IC.A.1, HSS.IC.A.2, HSS.IC.B.3, HSS.IC.B.3, HSS.IC.B.4, HSS.IC.B.5, HSS.IC.B.6, HSS.CP.A.1, HSS.CP.A.2, HSS.CP.A.3, HSS.CP.A.4, HSS.CP.A.5, HSS.CP.B.6, HSS.CP.B.7, HSS.CP.B.8, HSS.CP.B.9, HSS.MD.A.1, HSS.MD.A.2, HSS.MD.A.3, HSS.MD.A.4, HSS.MD.B.5, HSS.MD.B.6, HSS.MD.B.7

http://www.corestandards.org/Math/

Project-based Learning Tasks:

- Several will be utilized throughout the curriculum - provided by Big Ideas curriculum, as well as original tasks created by the teacher

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.

Technology:

- Students must engage in technology applications integrated throughout the curriculum.

Applicable technology utilized in this curriculum are included below:
Ti-83 Graphing Calculators
Desmos
Big Ideas
Khan Academy

Resources:

- Ancillary resources and materials used to deliver instruction are included below:

Various technology & math websites
Supplemental material created by the teacher as needed

Curriculum Development Resources/Instructional Materials:

List or Link Ancillary Resources and Curriculum Materials Here:

- Big Ideas
- Various technology & math websites
- Supplemental material created by the teacher as needed

Board of Education Approved Text(s)

- Big Ideas Math - Algebra 2