

**COURSE TITLE**

College Mathematics

**LENGTH**

Full Year

**DEPARTMENT**

STEM Department

**SCHOOL**

Rutherford High School

**DATE**

September 10, 2018

## College Mathematics

### I. Introduction/Overview/Philosophy

College Mathematics is an intensive course in the fundamentals of mathematics, algebra, and geometry designed to develop, sharpen, and extend those mathematical skills necessary for continued progress in mathematics. It is geared primarily for students who would rather master and extend skills than choose a more advanced elective. The course aims to enable students to better meet their potential in their performance on the college placement tests such as those given in the New Jersey State Colleges and State Universities. Students are expected to use the information and technology in various ways in real world applications.

### II. Objectives

#### *Course Outline:*

1. Fundamental Concepts of Algebra
  - a. Explore, investigate, and review the set of real numbers
  - b. Polynomials, factoring, and fractional expressions
2. Equations and Inequalities
  - a. Linear and Quadratic Equations
  - b. Radical, Absolute Value, and Fractional Equations
3. Functions and Graphs
  - a. Graphs of Equations
  - b. Linear Modeling and Direct Variation
  - c. Functions
  - d. Transformations of Functions
  - e. Inverse Functions
4. Polynomial and Rational Functions
  - a. Quadratic Functions and Models
  - b. Polynomial Functions of Higher Degree
  - c. Polynomial Division
  - d. Real Zeros of Polynomial Functions
  - e. Complex Numbers
  - f. The Fundamental Theorem of Algebra
5. Exponential and Logarithmic Functions
  - a. Properties of Logarithms
  - b. Solving Exponential and Logarithmic Equations
  - c. Exponential and Logarithmic Models
6. Systems of Equations and Inequalities
  - a. Solving Systems using Substitution
  - b. Solving Systems Using Elimination
  - c. Systems of Inequalities
7. Matrices and Determinants
  - a. Matrices and Linear Systems

- b. Operations with Matrices
  - c. The Inverse of a Square Matrix
  - d. Determinant of a square matrix
8. Sequences, Series, and Probability
- a. Sequences and Summation Notations
  - b. Arithmetic Sequences and Partial Sums
  - c. Geometric Sequences and Series
  - d. Counting Principles
9. Probability

***Student Outcomes:***

After successfully completing this course, the student will:

- Investigate and appreciate the structure of the number system.
- Understand algebra as a logical structure of abstract thinking.
- Reinforce algebra and geometry skills to apply to problem-solving situations.
- Use technology appropriately to solve problems.
- Represent and understand the behavior of a variety of relationships and functions and use them to model real-world phenomena.

***New Jersey Student Learning Standards******CAREER READY PRACTICES******CRP1 Act as a responsible and contributing citizen and employee.***

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

***CRP2 Apply appropriate academic and technical skills.***

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

***CRP4 Communicate clearly and effectively and with reason.***

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

***CRP6. Demonstrate creativity and innovation.***

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

***CRP7. Employ valid and reliable research strategies.***

Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

***CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.***

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

***CRP11. Use technology to enhance productivity.***

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

## ***TECHNOLOGY***

**Standard 8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

**Strand F: Critical thinking, problem solving, and decision making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.1.12.F.1- Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.

## ***21ST CENTURY LIFE AND CAREERS***

### ***9.1 Personal Financial Literacy***

#### ***Strand A: Income and Careers***

9.1.12.A.1 Differentiate among the types of taxes and employee benefits.

9.1.12.A.2 Differentiate between taxable and nontaxable income.

#### ***Strand B: Money Management***

9.1.12.B.2 Compare strategies for saving and investing and the factors that influence how much should be saved or invested to meet financial goals.

9.1.12.B.3 Construct a plan to accumulate emergency “rainy day” funds.

9.1.12.B.5 Analyze how changes in taxes, inflation, and personal circumstances can affect a personal budget.

9.1.12.B.8 Describe and calculate interest and fees that are applied to various forms of spending, debt,

and saving.

**Strand C: Credit and Debt Management**

9.1.12.C.1 Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.

**Strand D: Planning, Saving, and Investing**

9.1.12.D.4 Assess factors that influence financial planning.

9.1.12.D.14 Evaluate how taxes affect the rate of return on savings and investments.

**9.2 Career Awareness, Exploration, and Preparation**

**Strand C: Career Preparation**

9.2.12.C.1 Review career goals and determine steps necessary for attainment.

**NEW JERSEY STUDENT LEARNING STANDARDS- MATH**

A-APR.A.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

A-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  $p(x)$ .

A-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.

A-APR.C.4. Prove polynomial identities and use them to describe numerical relationships.

A-APR.D.6. Rewrite simple rational expressions in different forms; 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  $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.

A-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.

A-REI.A.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

A-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. ★

A-REI.B.4. Solve quadratic equations in one variable.

A-REI.C.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

A-SSE-A.1. Interpret expressions that represent a quantity in terms of its context. 1

A-SSE-A.2. Use the structure of an expression to identify ways to rewrite it.

A-SSE-B.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★

A-SSE-B.4. Derive and/or explain the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.

A-SSE-A.2. Use the structure of an expression to identify ways to rewrite it.

A-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.

A-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-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.

A-REI.A.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

A-REI.B.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A-REI.B.4. Solve quadratic equations in one variable.

A-REI.C.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

A-SSE-A.1. Interpret expressions that represent a quantity in terms of its context.1

A-SSE-A.2. Use the structure of an expression to identify ways to rewrite it.

A-SSE-B.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★

F-BF.A.1. Write a function that describes a relationship between two quantities.

F-BF.B.3. Identify the effect on the graph of replacing  $f(x)$  by  $f(x) + k$ ,  $k f(x)$ ,  $f(kx)$ , and  $f(x + k)$  for specific values of  $k$  (both positive and negative); find the value of  $k$  given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F-BF.B.4. Find inverse functions.

F-IF.B.4. For a function that models a relationship between two quantities, 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. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-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.

F-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

F-IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

F-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

F-LE.A.4. Understand the inverse relationship between exponents and logarithms. For exponential models, express as a logarithm the solution to  $abct = d$  where  $a$ ,  $c$ , and  $d$  are numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

F-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.

F-BF.B.4. Find inverse functions.

F-BF.B.5. (+) Use the inverse relationship between exponents and logarithms to solve problems involving logarithms and exponents.

F-IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

F-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F-IF.A.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

F-IF.B.4. For a function that models a relationship between two quantities, 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. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

F-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.

F-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

F-IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

F-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.

F-LE.A.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

F-LE.A.4. Understand the inverse relationship between exponents and logarithms. For exponential models, express as a logarithm the solution to  $abct = d$  where  $a$ ,  $c$ , and  $d$  are numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

N-CN.A.1. Perform arithmetic operations with complex numbers.

N-CN.A.2. Use the relation  $i^2 = -1$  and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

N-CN.C.7. Solve quadratic equations with real coefficients that have complex solutions.

N-CN.C.9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

N-Q.A.2. Define appropriate quantities for the purpose of descriptive modeling.

N-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.

N-RN.A.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

N-VM.A. Represent and model with vector quantities.

N-VM.A.2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.

N-VM.A.3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.

N-VM.C.7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.

N-VM.C.8. (+) Add, subtract, and multiply matrices of appropriate dimensions.

N-VM.B.4. (+) Add and subtract vectors.

N-VM.B.5. (+) Multiply a vector by a scalar.

N-Q.A.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N-Q.A.2. Define appropriate quantities for the purpose of descriptive modeling.

N-Q.A.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

N-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.

N-RN.A.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

S-CP.A.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).

S-CP.A.2. Understand that two events  $A$  and  $B$  are independent if the probability of  $A$  and  $B$  occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

S-CP.A.3. Understand the conditional probability of A given B as  $P(A \text{ and } B)/P(B)$ , and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

S-CP.A.4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

S-CP.A.5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

S-CP.B.6. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.

S-CP.B.7. Apply the Addition Rule,  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ , and interpret the answer in terms of the model.

S-IC.A.1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S-IC.A.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation

S-IC.B.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S-IC.B.4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

S-IC.B.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S-IC.B.6. Evaluate reports based on data.

### ***Mathematical Practices***

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

## **III. Proficiency Levels**

College Mathematics is available to students who have successfully completed Algebra 2 or its equivalent.

## **IV. Methods of Assessment**

### **Student Assessment**

The teacher will provide a variety of assessments during the course of the year. The assessment may include but is not limited to: chapter and unit tests and quizzes, teacher observations, open-ended problems, cooperative work, and homework.

### **Curriculum/Teacher Assessment**



The teacher will provide the subject area supervisor with suggestions for changes on an ongoing basis.

## **V. Grouping**

College Mathematics is a heterogeneously grouped junior/senior level course.

## **VI. Articulation/Scope & Sequence/Time Frame**

Course length is one year.

## **VII. Resources**

### *Texts/Supplemental Reading/References*

Larson, Hostetler, College Algebra, Concepts and Models, Fifth Edition, Houghton, Mifflin, 2006.

## **VIII. Suggested Activities**

Appropriate activities are listed in the curriculum map.

## **IX. Methodologies**

The following methods of instruction are suggested: teacher guided explorations, working in groups/working with a partner, working with manipulatives and discovery activities.

## **X. Interdisciplinary Connections**

Connections are made to science, particularly physics, by means of projects coordinating topics in the two subject areas. Writing assignments and portfolios strengthen the connection between mathematics, language arts literacy, fine arts, and music.

## **XI. Differentiating Instruction for Students with Special Needs: Students with Disabilities, Students at Risk, English Language Learners, and Gifted & Talented Students**

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.

Differentiating in this course includes but is not limited to:

*Differentiation for Support (ELL, Special Education, Students at Risk)*

- Peer mentoring on problems
- Differentiated teacher feedback on assignments

- Modeling out problems on whiteboard
- Visual aids as we project problems on whiteboard
- Study guides
- Tiered assignments
- Scaffolding of materials and assignments
- Re-teaching and review
- Guided note taking
- Exemplars of varied performance levels
- Multi-media approach to accommodating various learning styles

*Differentiation for Enrichment*

- Supplemental reading material for independent study
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Enhanced expectations for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix

## **XII. Professional Development**

The teacher will continue to improve expertise through participation in a variety of professional development opportunities.

**XII. Curriculum Map/Pacing Guide**

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<b>Fundamental Concepts of Algebra</b> <ul style="list-style-type: none"> <li>• Explore, investigate, and review the set of real numbers</li> <li>• Polynomials, factoring, and fractional expressions</li> </ul>	4 weeks	<i>For Support:</i> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified homework assignments</li> <li>• Use of a calculator</li> <li>• Use of IXL</li> <li>• Rephrase questions, directions, and explanations</li> </ul> <i>For Enhancement:</i> <ul style="list-style-type: none"> <li>• Use of IXL</li> <li>• Interest-based instruction</li> <li>• Real-world problems and scenarios</li> </ul>	N.RN.1-2; N.Q.1-3; A.SSE.1-3; A-APR.1-3; A.CED.1-2; A.REI.1.1-4,6; F.IF.1.2,2,4,5,7,8; F.BF.4,5; F.LE.1,3,4 CRP1,4,6,7,8,11 8.1.12.F.1	<i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Do nows</li> <li>• Exit tickets</li> <li>• Kahoot</li> <li>• Self-assessment</li> <li>• Desmos activities</li> <li>• Homework</li> <li>• Classwork</li> <li>• Teacher observation</li> </ul> <i>Summative Assessment</i> Project: <ul style="list-style-type: none"> <li>• Musical Notes-students calculate frequencies and explain mathematically why two musical notes “harmonize”</li> </ul> Quizzes <ul style="list-style-type: none"> <li>• Exponents, Radicals</li> <li>• Polynomials and Factoring</li> <li>• Fractional Expressions</li> </ul> Unit Test <ul style="list-style-type: none"> <li>• Fundamental Concepts of Algebra</li> </ul>
<b>Equations and Inequalities</b> <ul style="list-style-type: none"> <li>• Linear and Quadratic Equations</li> <li>• Radical, Absolute Value, and Fractional Equations</li> </ul>	4 weeks	<i>For Support:</i> <ul style="list-style-type: none"> <li>• Teacher modeling</li> <li>• Pairing of students</li> <li>• Use of a calculator</li> <li>• Guided notes</li> </ul>	A-APR.2-3, A-REI.1-2, 11 A-SSE.1-4, F-BF.1, N-RN.1-2,	<i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Do nows</li> <li>• Exit tickets</li> <li>• Kahoot</li> <li>• Self-assessment</li> </ul>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
		<ul style="list-style-type: none"> <li>Modified assignments and assessments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Khan Academy</li> <li>Real-world problems and scenarios</li> <li>Use of IXL</li> </ul>	A-REI.4, F-IF.4,6,7-9, F-LE.4, N-Q.2, A-APR.4,6 A-REI.7, F-BF.3-4, F-LE.5, N-CN.1-2,7,9 A-APR.1, CRP1,4,6,7,8,11	<ul style="list-style-type: none"> <li>Desmos activities</li> <li>Homework</li> <li>Classwork</li> <li>Teacher observation</li> </ul> <p><i>Summative Assessment:</i>            Quizzes</p> <ul style="list-style-type: none"> <li>Linear Equations</li> <li>Quadratic Equations</li> <li>Inequalities</li> </ul> Quarter 1 Benchmark
<b>Functions and Graphs</b> <ul style="list-style-type: none"> <li>Graphs of Equations</li> <li>Linear Modeling and Direct Variation</li> <li>Functions</li> <li>Transformations of Functions</li> <li>Inverse Functions</li> </ul>	5 weeks	<p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>Use of Desmos</li> <li>Use of IXL</li> <li>Use of graphing calculator</li> <li>Allow errors</li> <li>Modification of content and student products</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Use of Desmos</li> <li>Use of IXL</li> <li>Use of Khan Academy</li> <li>Real-world problems and scenarios</li> </ul>	A-APR.1,2-4,6 A-REI.1-2,4,7,11 A-SSE.1,2-4, F-BF.1, 3-4 F-IF.4, 6 N-RN.1-2, F-IF.7-9 F-LE.4, N-Q.2, F-LE.5, N-CN.1-2,7,9 CRP1,4,6,7,8,11	<p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>Do nows</li> <li>Exit tickets</li> <li>Kahoot</li> <li>Self-assessment</li> <li>Desmos activities</li> <li>Homework</li> <li>Classwork</li> <li>Teacher observation</li> </ul> <p><i>Summative Assessment:</i>            Quizzes</p> <ul style="list-style-type: none"> <li>Graphs of Equations</li> <li>Linear Modeling</li> <li>Graphs/Transformations of Functions/ Inverse Functions</li> </ul> Unit Test-Functions and Graphs
<b>Polynomial and Rational Functions</b>	5 weeks	<p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>Use of visual and multi-</li> </ul>	A-APR.1-4,6 A-REI.1-2,4,7,11	<p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>Do nows</li> </ul>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<ul style="list-style-type: none"> <li>• Quadratic Functions and Models</li> <li>• Polynomial Functions of Higher Degree</li> <li>• Polynomial Division</li> <li>• Real Zeros of Polynomial Functions</li> <li>• Complex Numbers</li> <li>• The Fundamental Theorem of Algebra</li> </ul>		<p>sensory formats</p> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified assignments and assessments</li> <li>• Use of IXL</li> <li>• Teacher modeling</li> <li>• Use of Desmos</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>• Use of IXL</li> <li>• Use of Khan Academy</li> <li>• Critical/Analytical thinking tasks</li> <li>• Use of Desmos</li> </ul>	A-SSE.1,2-4, F-IF.4, 6 N-RN.1-2, F-IF.7-9 F-LE.4, N-Q.2, F-BF.1,3-4, F-LE.5, N-CN.1-2, 7,9 CRP1,4,6,7,8,11	<ul style="list-style-type: none"> <li>• Exit tickets</li> <li>• Kahoot</li> <li>• Self-assessment</li> <li>• Desmos activities</li> <li>• Homework</li> <li>• Classwork</li> <li>• Teacher observation</li> </ul> <p><i>Summative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Project :Renewable Energy-students will use a graphing utility to find a quadratic model for solar energy consumption</li> </ul> <p>Quizzes (3 Total)</p> <ul style="list-style-type: none"> <li>• Polynomial Division</li> <li>• Complex Numbers</li> <li>• Fundamental Theorem of Algebra</li> </ul> <p>Unit Test-</p> <ul style="list-style-type: none"> <li>• Polynomial and Rational Functions</li> </ul> <p>Quarter 2 Benchmark</p>
<b>Exponential and Logarithmic Functions</b> <ul style="list-style-type: none"> <li>• Properties of Logarithms</li> <li>• Solving Exponential and Logarithmic Equations</li> <li>• Exponential and Logarithmic Models</li> </ul>	5 weeks	<p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified assignments and assessments</li> <li>• Use of IXL</li> <li>• Rephrase questions, directions, and explanations</li> <li>• Teacher modeling</li> <li>• Use of Desmos</li> </ul>	A-APR.1-4,6 A-REI.1-2,4,7,11 A-SSE.2-4, F-BF.1, F-IF.4, F-IF.6, N-RN.1-2, A-REI.4, F-IF.7-9, F-LE.4, N-Q.2,	<p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Do nows</li> <li>• Exit tickets</li> <li>• Kahoot</li> <li>• Self-assessment</li> <li>• Desmos activities</li> <li>• Homework</li> <li>• Classwork</li> <li>• Teacher observation</li> </ul>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
		<i>For Enhancement:</i> <ul style="list-style-type: none"> <li>• Use of IXL</li> <li>• Use of Desmos</li> <li>• Higher order thinking skills</li> <li>• Real-world problems and scenarios</li> <li>• Use of Khan Academy</li> </ul>	F-BF.3-4, F-LE.5, N-CN.1-2,7,9, A-SSE.1 CRP1,4,6,7,8,11	<i>Summative Assessment:</i> Quizzes <ul style="list-style-type: none"> <li>• Exponential/Logarithmic Functions</li> <li>• Properties of Logarithms</li> <li>• Solving Exponential and Logarithmic Equations</li> </ul> Unit Test Exponential and Logarithmic Functions
<b>Systems of Equations and Inequalities</b> <ul style="list-style-type: none"> <li>• Solving Systems using Substitution</li> <li>• Solving Systems Using Elimination</li> <li>• Systems of Inequalities</li> </ul>	3 weeks	<i>For Support:</i> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified assignments and assessments</li> <li>• Use of IXL</li> <li>• Pairing of students</li> <li>• Kuta software</li> </ul> <i>For Enhancement:</i> <ul style="list-style-type: none"> <li>• Use of IXL</li> <li>• Use of Desmos</li> <li>• Higher order thinking skills</li> <li>• Real-world problems and scenarios</li> <li>• Use of Khan Academy</li> </ul>	A-APR.1-4,6 A-REI.1-2,4,7,11 A-SSE.2-4, F-BF.1, F-IF.4, F-IF.6, N-RN.1-2, A-REI.4, F-IF.7-9, F-LE.4, N-Q.2, F-BF.3-4, F-LE.5, N-CN.1-2,7,9, A-SSE.1 CRP1,4,6,7,8,11	<i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Do nows</li> <li>• Exit tickets</li> <li>• Kahoot</li> <li>• Self-assessment</li> <li>• Desmos activities</li> <li>• Homework</li> <li>• Classwork</li> <li>• Teacher observation</li> </ul> <i>Summative Assessment:</i> Quizzes <ul style="list-style-type: none"> <li>• Solving Systems Using Substitution/Elimination</li> <li>• Systems of Inequalities</li> </ul> Unit Test- <ul style="list-style-type: none"> <li>• Systems of Equations and Inequalities</li> </ul> Quarter 3 Benchmark
<b>Matrices and Determinants</b> <ul style="list-style-type: none"> <li>• Matrices and Linear Systems</li> </ul>	4-5 weeks	<i>For Support:</i> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified homework assignments</li> </ul>	N-VM.A.1-3, N-VN.B.4-5, N-VM.C.7-8 CRP1,4,6,7,8,11	<i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Do nows</li> <li>• Exit tickets</li> <li>• Kahoot</li> </ul>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<ul style="list-style-type: none"> <li>Operations with Matrices</li> <li>The Inverse of a Square Matrix</li> <li>Determinant of a square matrix</li> </ul>		<ul style="list-style-type: none"> <li>Use of a calculator</li> <li>Use of IXL</li> <li>Rephrase questions, directions, and explanations</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Use of IXL</li> <li>Interest-based instruction</li> <li>Real-world problems and scenarios</li> </ul>		<ul style="list-style-type: none"> <li>Self-assessment</li> <li>Desmos activities</li> <li>Homework</li> <li>Classwork</li> <li>Teacher observation</li> </ul> <p><i>Summative Assessment:</i></p> <p>Quizzes</p> <ul style="list-style-type: none"> <li>Operations with matrices</li> <li>Inverse of a square matrix</li> <li>Determinant of a square matrix</li> </ul> <p>Unit Test</p> <ul style="list-style-type: none"> <li>Matrices and determinants</li> </ul>
<p><b>Sequences, Series, and Probability</b></p> <ul style="list-style-type: none"> <li>Sequences and Summation Notations</li> <li>Arithmetic Sequences and Partial Sums</li> <li>Geometric Sequences and Series</li> <li>Counting Principles</li> <li>Probability</li> </ul>	4 weeks	<p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>Teacher modeling</li> <li>Pairing of students</li> <li>Use of a calculator</li> <li>Guided notes</li> <li>Modified assignments and assessments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Use of IXL</li> <li>Use of Desmos</li> <li>Higher order thinking skills</li> <li>Real-world problems and scenarios</li> <li>Use of Khan Academy</li> </ul>	A-SSE.1,2, F-BF.1, F-IF.4,6,7,9 S-IC.3-6, A-APR.6, N-Q.2, S-IC.1-2, F-LE.5, S-CP.1-7, CRP1,4,6,7,8,11	<p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>Do nows</li> <li>Exit tickets</li> <li>Kahoot</li> <li>Self-assessment</li> <li>Desmos activities</li> <li>Homework</li> <li>Classwork</li> <li>Teacher observation</li> </ul> <p><i>Summative Assessment:</i></p> <p>Quizzes</p> <ul style="list-style-type: none"> <li>Arithmetic sequences and partial sums</li> <li>Geometric sequences and series</li> <li>Probability</li> </ul> <p>Unit Test</p> <ul style="list-style-type: none"> <li>Sequences, series, and probability</li> </ul> <p>Quarter 4 Benchmark</p>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<b>Financial Literacy Unit</b>	1 week	<p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>• Teacher modeling</li> <li>• Pairing of students</li> <li>• Use of a calculator</li> <li>• Guided notes</li> <li>• Modified assignments and assessments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>• Use of IXL</li> <li>• Use of Desmos</li> <li>• Higher order thinking skills</li> <li>• Real-world problems and scenarios</li> <li>• Use of Khan Academy</li> </ul>	9.1.12.A.1 9.1.12.A.2 9.1.12.B.2 9.1.12.B.3 9.1.12.B.5 9.1.12.B.8 9.1.12.C.1 9.1.12.D.4 9.1.12.D.14 9.2.12.C.1	<p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Questioning</li> <li>• Homework</li> <li>• Self-Assessment</li> </ul> <p><i>Summative Assessment:</i> Financial Literacy Project</p>