

Week	Marking Period 1	Week	Marking Period 3
1	Review Linear Functions	19	Counting Strategies, Probability & Binomials
2	Functions	20	Counting Strategies, Probability & Binomials
3	Functions	21	Trigonometry
4	Functions	22	Trigonometry
5	Direct & Inverse Variation	23	Trigonometry
6	Direct & Inverse Variation	24	Trigonometry
7	Direct & Inverse Variation	25	Exponential & Logarithmic Functions
8	Direct & Inverse Variation	26	Exponential & Logarithmic Functions
9	Linear Systems & Matrices	27	Exponential & Logarithmic Functions
Week	Marking Period 2	Week	Marking Period 4
10	Linear Systems & Matrices	28	Exponential & Logarithmic Functions
11	Linear Systems & Matrices	29	Polynomial Functions
12	Linear Systems & Matrices	30	Polynomial Functions
13	Quadratic Functions	31	Polynomial Functions
14	Quadratic Functions	32	Polynomial Functions
15	Quadratic Functions	33	Rational Functions
16	Radical Functions	34	Rational Functions
17	Radical Functions	35	Rational Functions
18	Radical Functions	36	Rational Functions

Time Frame	Standard- 10 days Block- 5 days
Topic	
Review of Linear Equations and Functions	
Essential Questions	
1.	How can mathematical ideas be represented?
2.	How are equations, inequalities, and their graphs used to solve real-world problems?
3.	Why are relations and functions represented in multiple ways?
4.	How does the graph of a given function or relation reflect its characteristics?
5.	How is a scatterplot used to analyze trends?
Enduring Understandings	
1.	Linear functions can be used to model real-world situations.
2.	Algebraic properties govern the fluent manipulation of symbols in expressions, equations, and inequalities.
3.	Linear functions can be represented verbally, numerically, graphically, and analytically to understand patterns and relationships.
4.	Rates of change can be represented mathematically and graphically.
Alignment to NJSLS	
F.FI.4, F.FI.5, F.FI.6, F.FI.7b, F.FI.9, A.SSE.1b, A.CED.2, A.CED.3, F.BF.3	
Key Concepts and Skills	
RELATIONS AND FUNCTIONS <ul style="list-style-type: none"> • Analyze relations and functions • Use relations and functions 	
LINEAR RELATIONS AND FUNCTIONS <ul style="list-style-type: none"> • Identify linear relations and functions • Write linear equations in standard form 	
RATE OF CHANGE AND SLOPE <ul style="list-style-type: none"> • Find the rate of change • Determine the slope of a line 	
WRITING LINEAR EQUATIONS <ul style="list-style-type: none"> • Write an equation of a line given the slope and a point on the line • Write an equation of a line parallel or perpendicular to a given line 	
SCATTERPLOTS AND LINES OF REGRESSION <ul style="list-style-type: none"> • Use scatterplots and prediction equations • Model data using lines of regression 	
SPECIAL FUNCTIONS <ul style="list-style-type: none"> • Write and graph piece-wise functions • Write and graph step and absolute value functions 	
PARENT FUNCTIONS AND TRANSFORMATIONS <ul style="list-style-type: none"> • Identify and use parent functions • Describe transformations of functions 	
GRAPHING LINEAR AND ABSOLUTE VALUE INEQUALITIES <ul style="list-style-type: none"> • Graph linear inequalities • Graph absolute value inequalities 	

Time Frame		Standard 25 days	Block 15 days				
Topic							
Functions							
Essential Questions							
1. How are functions and their graphs related? 2. How can technology be used to investigate properties of family of functions and their graphs? 3. What are some patterns in the manipulation or changes in functions?							
Enduring Understandings							
1. Graphs and equations are alternative ways for depicting and analyzing patterns of non-linear change. 2. Mathematical models can be used to describe physical relationships; these are often non-linear. 3. Creating a graph is not the same as interpreting the information displayed. 4. A variety of families of functions and methods can be used to model and solve real world situations.							
Alignment to NJSL							
F-IF.1, F-IF.4, F-IF.7, F-IF.7b, F-BF.3							
Key Concepts and Skills							
1. Determine if a relationship represents a function. 2. Determine the inverse of a function and find the domain. 3. Determine 1-1 functions. 4. Determine whether a function is odd, even or neither – algebraically or graphically. 5. Graph the basic parent functions; including linear, absolute value, quadratic, square root, cube root, exponential, logarithmic and reciprocal with and without the use of technology. 6. Identify the key characteristic of the parent functions using domain, range, local maxima and minima, global maxima and minima, and intervals of increasing and decreasing. 7. Write absolute value functions as piecewise functions. 8. Graph piecewise functions and describe domain and range. 9. Identify key characteristics of a quadratic function; including vertex intercepts, and axis of symmetry, using both algebraic and graphical approaches. 10. Solve real-world problems involving a variety of functions. 11. Transform functions.							
Learning Activities							
CBL Activities – Matching the Graph, Time v. Distance, Modeling Step Functions. Scatter Plots – Creating <i>Best Fit Lines</i> ; analyze goodness of fit, use for prediction. Graphing Calculator Discovery – Characteristics of Family of Curves, Effects of Transformations.							
Assessments							
Common Quizzes & Tests Homework, Classwork Journal Writing & Portfolio Creation							
21st Century Skills							
x	Creativity	x	Critical Thinking	x	Communication	x	Collaboration
x	Life & Career Skills	x	Information Literacy		Media Literacy		
Interdisciplinary Connections							
Students will see the relationships between survey taking and margin of error associated with real world history and science experiments and hypothesis vs experiments, Logic and Language							
Technology Integration							
8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. TI84 Graphing Calculator, ELMO and Computer with Projector, Responders							

Time Frame	Standard- 18 days Block- 9 days						
Topic							
Unit 2: Topics include direct and inverse variation functions, their characteristics and their graphs							
Essential Questions							
<ul style="list-style-type: none"> ◆ How do you describe the graphs of functions? ◆ How do you identify linear functions, slope of a line, and direct variation? ◆ How do you identify situations that involve constant products? ◆ How do you find the surface area and volume of spheres? ◆ How do you know that all spheres are similar? ◆ How do you model and apply relationships in which one quantity is proportional to the square or cube of another quantity? ◆ How do you simplify expressions with negative, zero and fractional exponents? ◆ How do you write expressions that describe situations in which quantities double or split in half? 							
Enduring Understandings							
<ul style="list-style-type: none"> ◆ Students should be able to graph and describe the properties of basic functions including double and half-life exponential modeling ◆ Students should recognize direct and indirect variation situations. ◆ Students should be able to simplify expressions with negative, zero and fractional exponents. 							
Alignment to NJSLs							
A-CED1, A-CED2, F-IF1, F-IF2, F-IF4, F-IF5, F-BF1A , S-ID7, S-ID8, N-RN1, N-RN2							
Key Concepts and Skills							
<p>Students should be able to find the volume and surface area of spheres.</p> <p>Students should recognize direct and indirect variation situations.</p> <p>Students should be able to simplify expressions with negative, zero and fractional exponents.</p>							
Learning Activities							
<ul style="list-style-type: none"> ◆ Supply and Demand Enrichment 8 in the Activity Bank, Study Guide 2-1, Problem Set 3, Diagram Master 1 in the Explorations Lab Manual ◆ Any Way You Look at It, Enrichment 9 in the Activity Bank, Study Guide 2-2, Problem Set 3, Additional Exploration 3, Diagram Master 2 in the Explorations Lab Manual, Overhead Visual 2 ◆ Levers, Enrichment 10 in the Activity Bank, Study Guide 2-3, Problem Set 3, Diagram Master 1,13,14 in the Explorations Lab Manual, Overhead Visual 2 ◆ How Thin is a Balloon, Enrichment 11 in the Activity Bank, Study Guide 2-4, Problem Set 4 ◆ Using Your Noggin, Enrichment 12 in the Activity Bank, Study Guide 2-5, Problem Set 4 ◆ More Fractional Exponents, Enrichment 13 in the Activity Bank, Study Guide 2-6, Problem Set 4 Practice 15, Trying a Different Approach Enrichment 14 in the Activity Bank, Study Guide 2-7, Problem Set 4, Diagram Master 1, 2 15 in the Explorations Lab Manual Calculator: 							
Assessments							
Homework, Quiz, Test							
21 Century Skills							
x	Creativity	x	Critical Thinking		Communication		Collaboration
	Life & Career Skills		Information Literacy		Media Literacy		
Interdisciplinary Connections							
Students can partner their skills of doubling and halving with science growth patterns as well as populations of countries, food supplies and supply and demand functions							

Technology Integration

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

Using tables to Solve Doubling and Halving Problems TI84 Graphing Calculator, ELMO and Computer with Projector, TI Emulator, Responders

Time Frame

Standard- 17 days Block- 9 days

Topic

Unit 3: Linear Systems and Matrices

Essential Questions

- ◆ How do you solve systems of linear equations by graphing?
- ◆ How do you graph systems of linear inequalities?
- ◆ How do you solve systems of equations by substitution?
- ◆ How do you use relationships between the slopes of parallel and perpendicular lines?
- ◆ How do you solve systems of equations using addition-or-subtraction and choose a method for solving a system of equations?
- ◆ How do you use matrices to represent data sets and use matrix operations?
- ◆ How to use matrices to represent changes in the size or position of a polygon?
- ◆ How do you recognize when matrices can be multiplied and find the product of the two matrices?
- ◆ How do you use technology to find the inverses of matrices?
- ◆ How to use inverse matrices to solve systems of equations using the TI-83?

Enduring Understandings

Students understand and choose best method of solving systems of linear equations

Alignment to NJSL

A-REI5, A-REI-6, A-REI8, A-REI9, A-REI10, A-REI11, A-REI12, N-VM6, N-VM7, N-VM8, N-VM9, N-VM10

Key Concepts and Skills

- ◆ Understand and use relationships between the slopes of parallel and perpendicular lines
- ◆ Solve systems of equations using addition-or-subtraction and choose a method for solving a system of equations

Learning Activities

- ◆ Apples, Parabolas and Luck, Enrichment 15 in the Activity Bank, Study Guide 3-1, Problem Set 5, Diagram Master 1,2 in the Explorations Lab Manual
- ◆ Substituting Substitutions, Enrichment 16 in the Activity Bank, Study Guide 3-2, Problem Set 5, Diagram Master 2 in the Explorations Lab Manual
- ◆ Linear Programming, Enrichment 17 in the Activity Bank, Study Guide 3-3, Problem Set 5, Diagram Master 1 in the Explorations Lab Manual
- ◆ Equations in a Lunch Box, Enrichment 18 in the Activity Bank, Study Guide 3-4, Problem Set 5
- ◆ Magic Squares, Enrichment 19 in the Activity Bank, Study Guide 3-5, Problem Set 6, Additional Explorations 5
- ◆ Moving a Caricature, Enrichment 20 in the Activity Bank, Study Guide 3-6, Problem Set 6, Diagram Master 2 in the Explorations Lab Manual, Calculator: Transformations Using Matrices and Draw Feature
- ◆ Determinants and Cramer's Rule, Enrichment 21 in the Activity Bank, Study Guide 3-7, Problem Set 6 Inverses of Matrices, Enrichment 22 in the Activity Bank, Study Guide 3-8, Problem Set 6, Calculator: Another Way to Find the Inverse of a Matrix

Assessments

Homework, Quiz , Chapter Test

21 Century Skills

	Creativity	x	Critical Thinking	x	Communication	x	Collaboration
	Life & Career Skills		Information Literacy		Media Literacy		

Interdisciplinary Connections

This section can be paired with historical trends and supply and demand functions of world economies

Technology Integration

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

Calculator: Using Matrices to Solve Systems of Equations TI84 Graphing Calculator, ELMO and Computer with Projector, Responders

Time Frame	Standard- 16 days Block- 8 days
Topic	
Unit 4: Quadratic Functions	
Essential Questions	
<ul style="list-style-type: none"> ◆ How do the coefficients of a quadratic function influence its graph: the direction it opens, its vertex, its line of symmetry, and its y-intercept? ◆ How does the equation of a quadratic function determine the translation of a parabola? ◆ How do you solve simple quadratic equations by graphing and undoing? ◆ How do you solve quadratic equations by factoring? ◆ How do you use the quadratic formula to solve quadratic equations? ◆ How do you use the discriminant to find the number of real solutions of a quadratic equation? ◆ How do you add, subtract and multiply complex numbers? ◆ How do you solve problems using quadratic systems? 	
Enduring Understandings	
<ul style="list-style-type: none"> ◆ Students should be able to graph and describe the properties of quadratic functions ◆ Students should be able to factor quadratic functions ◆ Students should be able to find the discriminant, the vertex, zeros of the quadratic function 	
Alignment to NJSL	
F-IF7a, c, F-IF8, A-APR1, 3, A-SSE3a, A-SSE3b	
Key Concepts and Skills	
<ul style="list-style-type: none"> ◆ Students should be able to understand how the coefficients of a quadratic function influence its graph: the direction it opens, its vertex, its line of symmetry, and its y-intercept ◆ Students should be able to solve quadratic equations by factoring, quadratic formula and calculator ◆ Students should be able to add, subtract and multiply complex numbers (calculator in complex mode) 	
Learning Activities	
<ul style="list-style-type: none"> ◆ Points, Lines and Parabolas, Enrichment 23 in the Activity Bank, Study Guide 4-1, Problem Set 7, Calculator: Investigating Parabolas ◆ Graphing $y=x^{1/2}$ Enrichment 24 in the Activity Bank, Study Guide 4-2, Problem Set 7, Diagram Master 2 in the Explorations Manual ◆ Completing the Square Enrichment 25 in the Activity Bank, Study Guide 4-3, Problem Set 7 ◆ The Right Combination, Enrichment 26 in the Activity Bank, Study Guide 4-4, Problem Set 7, Diagram Master 2-4 in the Explorations Manual, Overhead Visual 	

- ◆ Team Work, Enrichment 27 in the Activity Bank, Study Guide 4-5, Calculator: Approximating Solutions Using A Quadratic Formula Program or Graphing
- ◆ Complex Conjugates Enrichment 28 in the Activity Bank, Study Guide 4-6, Problem Set 8
- ◆ Parabolas and Art Enrichment 29 in the Activity Bank, Study Guide 4-7, Problem Set 8, Calculator: Finding Intersections of Parabolas

Assessments

Homework, Quiz, Test

21st Century Skills

Creativity	x	Critical Thinking	x	Communication	x	Collaboration
Life & Career Skills		Information Literacy		Media Literacy		

Interdisciplinary Connections

The quadratic equation can be in a marketing class to discuss real world supply and demand functions, also in a science classroom to demonstrate maximum and minimum

Technology Integration

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

Calculator: Using Calculator to solve quadratic roots and systems of quadratic equations, TI84 Graphing Calculator, ELMO and Computer with Projector, Responders

Time Frame	Standard- 9 days Block- 5 days
Topic	
Unit 6: Counting Strategies, Probability, and Binomials	
Essential Questions	
What techniques can be used for solving probability problems?	
Enduring Understandings	
<ul style="list-style-type: none"> ◆ How do you use diagrams and tables to count possibilities? ◆ How do you use the multiplication counting principle to find a number of possible arrangements of items? ◆ How do you find the probability of an event and of mutually exclusive events? ◆ How do you relate probability to odds? ◆ How do you find patterns in Pascal's triangle? ◆ How do you find probabilities for experiments that have two outcomes for each trial and where the probability of each outcome is one-half? ◆ How do you find probabilities for binomial experiments where the probability is not one-half? ◆ How do you find powers of binomials? 	
Alignment to NJSLS	
S-CP1, S-CP2, S-CP3, S-CP6, S-CP7, S-CP8, S-CP9	
Key Concepts and Skills	
<ul style="list-style-type: none"> ◆ How to find the probability of independent and dependent events ◆ How to find the number of ways to select some items from a group ◆ How to recognize the elements of Pascal's triangle as combinations 	
Learning Activities	

- ◆ Finding Who Plays Whom, Enrichment 36 in the Activity Bank, Study Guide 6-1, Problem Set 11
- ◆ Permutations with Repetitions Enrichment 37 in the Activity Bank, Study Guide 6-2, Problem Set 11, Additional Exploration 7
- ◆ Buffon’s Needle Problem Enrichment 38 in the Activity Bank, Study Guide 6-3, Problem Set 11
- ◆ Inclusive Events Enrichment 39 in the Activity Bank, Study Guide 6-4, Problem Set 11
- ◆ Latin Squares Enrichment 40 in the Activity Bank, Study Guide 6-5, Problem Set 12
- ◆ The Problem of Points Enrichment 41 in the Activity Bank, Study Guide 6-6, Problem Set 12, Additional Exploration 8, Copy of Pascal’s Triangle for Student use, Calculator: Permutations, Combinations, and Pascal’s Triangle
- ◆ The Average Height Enrichment 42 in the Activity Bank, Study Guide 6-7, Problem Set 12
- ◆ The Mysterious Salmon Enrichment 43 in the Activity Bank, Study Guide 6-8, Problem Set 13
- ◆ Binomial Experiments Enrichment 44 in the Activity Bank, Study Guide 6-9, Problem Set 13
- ◆ TI84 calculator Probability Simulation usage for coins, dice, marbles, spinners, cards, and random number generator

21 Century Skills

x	Creativity	x	Critical Thinking		Communication		Collaboration
	Life & Career Skills		Information Literacy		Media Literacy		

Interdisciplinary Connections

History, Science and Economics depend on “What if “questions and the probability of events occurring. The idea of equal outcomes as well as a shift in balance can decide the outcome of an event (Like an election, Trick coin, Sports)

Technology Integration

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

Copy of Pascal’s Triangle for Student use, TI-83 or Scientific Calculator, TI84 Graphing Calculator, ELMO and Computer with Projector, Responders

Time Frame	Standard- 21 days Block- 11 days
Topic	
Unit 7: Trigonometry	
Essential Questions	
<ul style="list-style-type: none"> ◆ How are the cofunctions of sine, cosine and tangent used to determine information about a right triangle? ◆ How are radians related to degree measure? 	
Enduring Understandings	
Geometric relationships provide a way to make sense of a variety of phenomena.	
Alignment to NJSLS	
F-TF, F-TF.1, F-TF.2 , F-TF3, F-TF4, F-TF5, F-TF6, T-TF7	
Key Concepts and Skills	
<ul style="list-style-type: none"> ◆ Apply radian and degree angular measurements to describe angles ◆ Convert from one type of measurement to the other 	

Learning Activities

- ◆ Review Special Right Triangles from Geometry, What is a Radian? Convert from degrees to radians
Real World Numbers Getting Your Bearings Enrichment Activity 51 ◆ Create the unit circle in degrees and radians
- ◆ Use radian and degree measure to solve trigonometric equations, use inverse trig key on calculator

Assessments

Homework, Quiz and Chapter Tests

21st Century Skills

Creativity	x	Critical Thinking		Communication	x	Collaboration
Life & Career Skills		Information Literacy		Media Literacy		

Interdisciplinary Connections

This unit connects to Physics Concepts, Earth Science, Geometry, Art, Visual Arts

Technology Integration

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

TI84 Several Videos on Trigonometry TI84 Graphing Calculator, ELMO and Computer with Projector, Responders

Time Frame	Standard- 21 Days	Block- 11 days
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Topic

Unit 8: Exponential and Logarithmic Functions

Essential Questions

- ◆ How can an exponential function represent a real-world scenario?
- ◆ How can the properties of logarithms be used to solve equations?
- ◆ Why does simplifying or expanding a logarithm expression help solve problems?

Enduring Understandings

- ◆ Functions families have common characteristics
- ◆ We can use algebra to help graph functions

Alignment to NJSL

F-IF, F-IF.7, F-IF.7e, F-LE.4

Key Concepts and Skills

Evaluate exponential functions and solve logarithmic functions

Learning Activities

- ◆ Define the number “e”
- ◆ Use exponential and logarithmic functions to describe real world scenarios including growth and decay.
Ex: Interest money problems, population growth, radioactive decay (half-life)

Assessments

Test, Quizzes and Homework

21st Century Skills

Creativity		Critical Thinking	x	Communication	x	Collaboration
X Life & Career Skills		Information Literacy		Media Literacy		

Interdisciplinary Connections

Mathematics applies to the sciences (bacteria growth, mineral decay, etc) Growth and Decay

Technology Integration

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

TI84 Graphing Calculators, Table feature on Calculator, Responders

Time Frame	Standard- 14 Days Block- 7 days						
Topic							
Polynomials and Polynomial Functions							
Essential Questions							
<ul style="list-style-type: none"> Why is math used to model real-world situations? How do we use polynomial patterns to make real-world predictions? How can I use the remainder and factor theorems to solve polynomials? 							
Enduring Understandings							
<ul style="list-style-type: none"> The arithmetic of rational expressions is governed by the same rules as the arithmetic of rational numbers. Defining and solving the problem begins by selecting the appropriate procedural tool. The characteristics of polynomial functions and their representations are useful in solving real-world problems. The domain and range of polynomial functions can be extended to include the set of complex numbers. 							
Alignment to NJSLs							
A.CED.1, A.REI.11, A.APR.2, A.APR.3, A.APR.4, F.FI.7c, N.CN.9							
Key Concepts and Skills							
SOLVING POLYNOMIAL EQUATIONS							
<ul style="list-style-type: none"> Factor polynomials Solve polynomial equations by factoring * Prove polynomial identities 							
THE REMAINDER AND FACTOR THEOREMS							
<ul style="list-style-type: none"> Evaluate functions by using synthetic substitution Determine whether a binomial is a factor of a polynomial by using synthetic substitution 							
ROOTS AND ZEROES							
<ul style="list-style-type: none"> Determine the number and type of roots for a polynomial equation Find the zeroes of a polynomial function Use a graphing calculator to analyze polynomial functions 							
RATIONAL ZERO THEOREM							
<ul style="list-style-type: none"> Identify possible rational zeros of a polynomial function Find all the rational zeros of a polynomial function 							
Learning Activities							
Algebra Tile Activity to divide polynomials Dividing Po							
Assessments							
Test, Quizzes and Homework							
21st Century Skills							
X	Creativity	X	Critical Thinking	x	Communication	x	Collaboration
X	Life & Career Skills		Information Literacy		Media Literacy		
Interdisciplinary Connections							
Business- forecast sales trends, develop profit margins							
Science- projectile motion							

Technology Integration

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

TI84 Graphing Calculators, Table feature on Calculator, Responders

Time Frame	Standard- 20 Days	Block- 20 days
Topic		
Rational Functions and Relations		
Essential Questions		
<ul style="list-style-type: none"> • Why are graphs useful? • How do we decide which method is most appropriate when solving rational equations? • When are asymptotes used to graph rational functions? 		
Enduring Understandings		
<ul style="list-style-type: none"> • Mastering a procedure is not the same as mastering the concept. • Simplified expressions are essential in being able to solve equations. • Domain affects graphing and solving of rational functions. 		
Alignment to NJSLS		
A.APR.6, A.APR.7, A.CED.1, A.CED.2, F.BF.3, F.IF.9, A.REI.2, A.REI.11		
MULTIPLYING AND DIVIDING RATIONAL EXPRESSIONS		
<ul style="list-style-type: none"> • Simply rational expressions • Simplify complex fractions 		
ADDING AND SUBTRACTING RATIONAL EXPRESSIONS		
<ul style="list-style-type: none"> • Determine the LCM of polynomials • Add and subtract rational expressions 		
GRAPHING RECIPROCAL FUNCTIONS		
<ul style="list-style-type: none"> • Determine properties of reciprocal functions • Graph transformations of reciprocal functions 		
GRAPHING RATIONAL FUNCTIONS		
<ul style="list-style-type: none"> • Graph rational functions with vertical and horizontal asymptotes • *Graph rational functions with oblique asymptotes and point discontinuity • Use a graphing calculator to explore the graphs of rational functions 		
VARIATION FUNCTIONS		
<ul style="list-style-type: none"> • Recognize and solve direct and joint variation problems • Recognize and solve inverse and combined variation problems 		
SOLVING RATIONAL EQUATIONS AND INEQUALITIES		
<ul style="list-style-type: none"> • Solve rational equations • Solve rational inequalities • Use a graphing calculator to solve rational equations by graphing or by using the table feature 		
Learning Activities		
“Inverse Variation” Lab Wind Chiems Paint Puzzler Harvir Needs a Car		
Assessments		
Quizzes & Common Chapter Tests Homework, Classwork		
21st Century Skills		

X	Creativity	X	Critical Thinking	x	Communication	x	Collaboration
X	Life & Career Skills		Information Literacy		Media Literacy		
Interdisciplinary Connections							
Science- Ohm's Law(current/voltage) Science- Water pressure (diameter vs flow rates) Social Studies & Health- Cost of health care vs population with flu							
Technology Integration							
8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. TI84 Graphing Calculators, Table feature on Calculator, Responders							

Time Frame	Standard- 15 Days Block- 7 days						
Topic							
Trigonometry							
Essential Questions							
<ul style="list-style-type: none"> • How can I make connections to angles to determine basic trigonometric values? • How can I evaluate trigonometric functions at any domain value by connecting experiences with special right triangles gained in Geometry? • How can I select and apply trigonometric functions to solve problems in contexts that model cyclical behavior? 							
Enduring Understandings							
<ul style="list-style-type: none"> • Model periodic phenomena with trigonometric functions • Analyze functions using different representations • Extend the domain of trigonometric functions using the unit circle • Build new functions from existing functions 							
Alignment to NJSL							
F.TF.1, F.TF.2, F.TF.5, F.TF.8							
Key Concepts and Skills							
<ul style="list-style-type: none"> • Draw and find angles in standard position • Convert between degree measures and radian measures • Find values of trigonometric functions for general angles • Find values of trigonometric functions by using reference angles • Find the values of trigonometric functions based on the unit circle • Use the properties of periodic functions to evaluate trigonometric functions • * Use trigonometric identities to find trigonometric values • *Use trigonometric identities to simplify expressions 							
Learning Activities							
<ul style="list-style-type: none"> • Construct a color coded unit circle • Define trigonometric functions using x, y, and r • Ferris Wheel Problem • Tide Problem • Spaghetti Lab 							
Assessments							
Quizzes & Common Chapter Tests Homework, Classwork							
21st Century Skills							
X	Creativity		Critical Thinking	x	Communication	x	Collaboration

		X				
	Life & Career Skills		Information Literacy		Media Literacy	
Interdisciplinary Connections						
Science- revolutions per minute, predicting weather, monitoring volcanoes Physics- velocity, distance						
Technology Integration						
8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. TI84 Graphing Calculators, Table feature on Calculator, Responders						