COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 1: Trigonometric Functions	**TIME FRAME:** 15-18 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3.GEOMETRY

A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
B. Apply transformations and use symmetry to analyze mathematical situations

4. MEASUREMENT

A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

5. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

6. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

7. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

8. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:	**UNIT OBJECTIVES:**
M11.A.1.1.1 Find the square root of an integer to the nearest tenth using either a calculator or estimation. **M11.A.1.1.3** Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$) **M11.A.2.1.3** Identify and/or use proportional relationships in problem solving settings.	• Determine measurement of angles • Find Values of right triangles • Compute the values of trig. functions of acute angles • Use trig. functions to find the measure of general angles • Investigate the unit circle • Sketch graphs of the six trigonometric functions

M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). **M11.A.3.2.1** Use estimation to solve problems. **M11.B.2.1.1** Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn). **M11.C.1.1.2** Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles. **M11.C.1.4.1** Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).	• Apply general graphing techniques to trigonometric functions
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. 6.1 • Convert between degrees minutes seconds and decimal form for angles • Find the arc length of a circle • Represent and use angle measure in radians and degrees • Find the linear speed of an object traveling in circular motion 6.2 • Find the Values of Trigonometric functions of acute angles • Use the fundamental identities • Find the remaining trigonometric functions given one value • Use Co functions of complementary angles 6.3 • Determine exact values for 30,45, and 60 angles • Use a calculator to approximate the values of trig functions 6.4 • Find the Exact value of Trigonometric functions for general angles • Use co terminal angles to find exact values of trigonometric functions • Determine the sings of the trigonometric functions • Find the reference angle of general angles	**ASSESSMENTS:** Observation and questioning Projects and Investigations Homework Quizzes Tests Assessment #1,2,3 **REMEDIATION:** Circumference and area of a circle Review Section R.3 p.31 Pythag. Thm. Review Sec. R. 3, pg 30 Unit Circle, Sec. 2.4 pg. 176 Even and Odd Function Sec. 3.3, pg. 240-242 Functions Sec. 3.1, pg 218- 226 Vertical Asymptotes sec 4.3, pg. 333-335 Rationalizing denominators **DIFFERENTIATION:** Project at Motorola, digital Transmission over the air (Attached) Project of identifying mountain peaks in Hawaii (attached) Activity 15.6 (Attached) Chapter Review page 586 problems 1-80 A Core Curriculum: Making Mathematics Count for everyone, NCTM Addenda Series, Grades 11-9 Trigonometry for oblique triangles, pg 87-90 **RESOURCES:** Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com http://www.themathpage.com/aTrig/trigonometry.htm

6.5 • Using the unit circle to determine exact values of trigonometric functions • Determine the domain and range of the six trigonometric functions • Use even and odd properties to find exact values of trigonometric functions 6.6 • Graph transformations of the sine and cosine functions • Determine the amplitude and period of a sinusoidal functions	

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 2: Analytic Trigonometry	**TIME FRAME:** 6 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3.GEOMETRY

A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

4. MEASUREMENT

A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

5. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

6. REASONING and PROOF

A. Make and investigate mathematical conjectures
B. Select and use various types of reasoning and methods of proof

7. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

8. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

9. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:	**UNIT OBJECTIVES:**
M11.A.2.2.1 Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10).	• Determine the inverse of the trigonometric functions • Verify Trigonometric identities • Use sum and difference formulas

M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). **M11.B.2.1.1** Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn). **M11.C.1.2.1** Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem). **M11.C.1.4.1** Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet). **M11.D.4.1.1** Match the graph of a given function to its table or equation.	
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. **7.1** • Find the exact value of the inverse sign, cosine, tangent functions. • Find the approximate value of the inverse sign, cosine, tangent functions. **7.2** • Find the Exact Value of expressions involving sine, cosine, and tangent functions • Use a calculator to evaluate the value of inverse functions **7.3** • Use algebra to simplify trigonometric expressions • Establish identities **7.4** • Use Sum and difference formulas to find exact values • Use Sum and difference formulas to find approximate values • Use Sum and difference formulas to establish identities	**ASSESSMENTS:** Observation and questioning Projects and Investigations Homework Quizzes Tests **REMEDIATION:** Inverse functions pg. 399-409 Domain and range pg. 541-542 Are you prepared pg. 606 Fundamental identities section 6.2 pg 510 **DIFFERENTIATION:** Project at Motorola, Sending Pictures Wirelessly(attached) Project of Jacobs Field(attached) Textbook page 654 problems 1-76 **RESOURCES:** Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com http://www.themathpage.com/aTrig/trigonometry.htm

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 3: Applications of Trigonometric Functions	**TIME FRAME:** 8 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3.GEOMETRY

A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
B. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT

A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

5. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

6. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

7. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

8. REPRESENTATION

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PA MATH ASSESSMENT ANCHORS:		UNIT OBJECTIVES:
M11.A.1.3.2	Compare and/or order any real numbers (rational and irrational may be mixed)...	• Apply Trigonometry to problem situations involving triangles • Use the Law of Sines to solve oblique triangles • Use the Law of Cosines to solve oblique triangles • Find the area of triangles using formulas
M11.A.3.1.1	Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used).	
M11.C.1.2.1	Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality	

Theorem). **M11.C.1.4.1** Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).	
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. 8.1 • Solve right triangles • Solve applied problems 8.2 • Solve SAA or ASA triangles • Solve SSA Triangles • Solve applied triangles 8.3 • Solve SAS Triangles • Solve SSS Triangles • Solve applied problems 8.4 • Find the Area of SAS triangles • Find the area of SSS Triangles	**ASSESSMENTS:** Observation and questioning Projects and Investigations Homework Quizzes Tests **REMEDIATION:** Complementary angle them. Pg 512-513 Difference formula for sines pg 619 Distance formula pg. 160 Are you prepared pg 665 **DIFFERENTIATION:** Activity 15.2 (Attached) Textbook pg. 703-704 1-52 Project of Motorola, How can you build or analyze a vibration profile (attached) Project of Leaning tower of Pisa (Attached) Project of Locating lost treasure (attached) **RESOURCES:** Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com http://www.themathpage.com/aTrig/trigonometry.htm

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 4: Equations and Inequalities	**TIME FRAME:** 15-18 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. MEASUREMENT

A. Apply appropriate techniques, tools, and formulas to determine measurements.

4. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

5. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

6. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

7. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:		**UNIT OBJECTIVES:**
M11.A.1.1.3	Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$)	• Solve linear equations • Solve quadratic equations • Solve quadratic equations in the complex number system • Solve radical equations • Solve inequalities • Solve equations and inequalities involving absolute value • Solve applications involving interest
M11.A.1.2.1	Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.	
M11.A.2.1.1	Solve problems using operations	

	with rational numbers including rates and percents (single and multi-step and multiple procedure operations) (e.g., distance, work and mixture problems, etc.).	
M11.A.2.2.2	Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive exponents only).	
M11.A.3.1.1	Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used).	
M11.D.2.1.1	Solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).	
M11.D.2.1.3	Write, solve and/or apply a linear equation (including problem situations).	
M11.D.2.1.5	Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula).	
M11.D.2.2.1	Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial).	
M11.D.2.2.2	Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is not equal to 0).	
M11.D.2.2.3	Simplify algebraic fractions.	

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

1.1

- Solve a linear equation, manually and mentally
- Solve applied linear equations

1.2

- Solve quadratic equations by factoring
- Solve quadratic equations using the quadratic formula
- Solve applied problems using the quadratic formula

1.3

ASSESSMENTS:

Observation and questioning
Projects and Investigations
Homework
Quizzes
Tests

REMEDIATION:

Review Section
Pg. 2-4, 8-14, 20-21
23-24, 43-50, 70-75

DIFFERENTIATION:

Project of Motorola, How many Cell phones can I make? (Attached)

RESOURCES:

• Add, Subtract, Multiply, and divide complex numbers • Solve quadratic equations in the complex number system 1.4 • Solve Radical Equations • Solve equations by factoring 1.5 • Use interval notation • Use properties of inequalities • Solve inequalities • Solve combined inequalities 1.6 • Solve equations involving absolute values • Solve inequalities involving absolute values 1.7 • Solve interest problems	Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 5: Graphs	**TIME FRAME:** 6 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY

A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
B. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
C. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

5. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

6. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

7. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:	**UNIT OBJECTIVES:**
M11.C.3.1.1 Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane (formula provided on the reference sheet).	• Use rectangular coordinates • Graph equations • Find equations and graphs of circles • Find equations of lines

M11.C.3.1.2	Relate slope to perpendicularity and/or parallelism (limit to linear algebraic expressions; slope formula provided on the reference sheet).	• Graph equations of lines • Find parallel and perpendicular equations of lines
M11.D.3.2.1	Apply the formula for the slope of a line to solve problems (formula given on reference sheet).	
M11.D.3.2.2	Given the graph of the line, 2 points on the line, or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form.	
M11.D.3.2.3	Compute the slope and/or y-intercept represented by a linear equation or graph.	

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

2.1
- Use the distance formula to find the distance between two points
- Use the midpoint formula to find the midpoint of a line segment

2.2
- Graph equations by plotting points
- Determine intercepts from a graph
- Determine intercepts from an equation
- Test equations for symmetry

2.3
- Write the standard form of an equation of a circle
- Graph a circle
- Find the center and the radius of a circle in general form and graph it

2.4
- Calculate and interpret the slope of a line
- Graph lines given a point and the slope
- Find the equation of a vertical line
- Use the point slope form of a line
- Identify horizontal lines
- Find the equation of a line given two points
- Write the equation of a line in slope-intercept form
- Identify the slope and y intercept of a line from its equation
- Write the equation of a line in general form

2.5

ASSESSMENTS:
Observation and questioning
Presentation and discussions
Projects and Investigations
Homework
Quizzes
Tests

REMEDIATION:
Plotting points
Algebra review section pg 17-24
Geometry review pg 29-31
Are you prepared pg 163
Are you prepared pg 179

Differentiation:
Project of Motorola, Mobile phone usage (attached)
Economics, Isocost Lines (attached)
Chapter Review pg. 213-214,1-40

RESOURCES:
Algebra and Trigonometry, Sullivan 7th edition
Attached Worksheets

WEB SITES
www.algebrahelp.com
www.coolmath.com
www.mathleague.com
www.interactmath.com

• Define parallel lines • Define perpendicular lines • Find equations of parallel lines • Find equations of perpendicular lines	

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 6: Functions and their graphs	**TIME FRAME:** 8 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3. MEASUREMENT

A. Apply appropriate techniques, tools, and formulas to determine measurements

4. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

5. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

6. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

7. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:	**UNIT OBJECTIVES:**
M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. **M11.D.1.1.2** Determine if a relation is a function given a set of points or a graph. **M11.D.1.1.3** Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table).	• Determine whether a relation is a function • Analyze graphs of functions • Perform operations on functions • Investigate and define properties of functions • Graph transformations of functions

M11.D.4.1.1 Match the graph of a given function to its table or equation.	
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. 3.1 • Determine whether a relation represents a function • Find the value of a function • Determine the domain and range of a function • Form the sum, difference, product, and quotient of two functions 3.2 • Identify the graph of a function • Obtain information from or about the graph of a function 3.3 • Determine even and odd functions from a graph. • Identify even and odd functions from the equation • Use a graph to determine where a function is increasing, decreasing, or constant • Use a graph to locate local maxima and minima • Use a graphing utility to approximate local extrema and where a function is increasing and decreasing 3.4 • Graph the ten basic functions • Graph piecewise-defined functions 3.5 • Graph functions using horizontal and vertical shifts • Graph functions using compressions and stretches • Graph functions using reflections	**ASSESSMENTS:** Observation and questioning Projects and Investigations Homework Quizzes Tests **REMEDIATION:** Evaluate algebraic expressions review section pg 20-21 Intercepts pg. 169-170 Are you prepared? pg 248 Graphs of key equations ex. 3,4,5,12 pg 167-173 **Differentiation:** Project at Motorola, Pricing wireless service (Attached) Cost of Cable(attached) Oil Spill project (attached) **RESOURCES:** Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 7: Polynomial and Rational Functions	**TIME FRAME:** 8 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3. PROBLEM SOLVING

A. Solve problems that arise in mathematics and in other contexts
B. Apply and adapt a variety of appropriate strategies to solve problems

4. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

5. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

6. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

STATE STANDARDS:	**UNIT OBJECTIVES:**
M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. **M11.D.1.1.2** Determine if a relation is a function given a set of points or a graph. **M11.D.1.1.3** Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table). **M11.D.2.2.1** Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by	• Identify quadratic functions and models • Identify polynomial functions • Identify and analyze the graphs of rational functions • Use the properties of rational functions • Solve polynomial and rational inequalities

a trinomial). **M11.D.2.2.3** Simplify algebraic fractions.	
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. 4.1 • Graph a quadratic function using transformations • Identify the vertex and axis of symmetry of a quadratic function • Graph a quadratic function using its vertex, axis, and intercepts • Use a graphing utility to find the quadratic function of best fit to data 4.2 • Identify polynomial functions and their degree • Graph polynomial functions using transformations • Identify the zeros of a polynomial function and their multiplicity • Analyze the graph of a polynomial function 4.3 • Find the domain and range of a rational function • Determine the vertical, horizontal, and oblique asymptotes of a rational function 4.4 • Analyze the graph of a rational function 4.5 • Solve polynomial and rational inequalities	**ASSESSMENTS:** **REMEDIATION:** Are you prepared pg 326 Graphing techniques: transformations pg 262-271 Rational expressions pg 58-67 Solving inequalities pg. 125-133 **Differentiation:** Project Motorola, How many cell phones can I make (Attached) Cannons pg 388 First and second differences (Attached) Weed pollen (Attached) Maclaurin Series (Attached) Theory of Equations (Attached) **RESOURCES:** Algebra and Trigonometry, Sullivan 7th edition Attached Worksheets **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

COURSE: Algebra III/ Trigonometry	**GRADE(S):** 11-12th Grade
UNIT 8: Exponential and Logarithmic Functions	**TIME FRAME:** 13 – 15 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships

3. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
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D. Use the language of mathematics to express mathematical ideas precisely

4. CONNECTIONS

A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

5. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

STATE STANDARDS:

M11.A.2.2.1 Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10).

M11.A.2.2.2 Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive Exponents only).

M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve Problems (any rational numbers may be used).

M11.D.2.2.3 Simplify algebraic fractions.

M11.D.4.1 Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.

UNIT OBJECTIVES:

- Evaluate and find Composite functions
- Evaluate and find Inverse functions
- Evaluate and Graph Exponential Functions
- Solve Exponential Functions
- Define the properties of Logarithms
- Evaluate logarithmic functions
- Determine the domain and range of logarithmic functions
- Solve and graph logarithmic equations and functions

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

5.1
- Form a composite function and find its domain and range.

5.2
- Determine the inverse of a function
- Obtain the graph of the inverse function from the graph of a function
- Find the inverse function (f^{-1})

5.3
- Evaluate and graph exponential functions
- Define the number e
- Solve Exponential equations

5.4
- Change exponential expressions to logarithmic expressions
- Change logarithmic expressions to exponential expressions
- Evaluate logarithmic functions
- Determine the domain and range of a logarithmic functions
- Graph logarithmic functions
- Solve logarithmic functions

5.5
- Write logarithmic expressions as a sum or difference of logarithms
- Write a logarithmic expression as a single logarithm
- Evaluate logarithms whose base is neither 10 nor e

5.6
- Solve logarithmic equations using the properties of logarithms
- Solve exponential equations
- Solve logarithmic and exponential equations using a graphing utility

ASSESSMENTS:
Observation and questioning
Presentation and discussions
Projects and Investigations
Homework
Quizzes
Tests

REMEDIATION:
Finding values of a functions pg 221-223
Are you prepared pg 409
Solving equations pg 84-90, 96-105
Are you prepared pg 423
Are you prepared pg 437

Differentiation:
Depreciation of a new car

RESOURCES:
Algebra and Trigonometry, Sullivan 7th edition
Attached Worksheets

WEB SITES
www.algebrahelp.com
www.coolmath.com
www.mathleague.com
www.interactmath.com