Sayreville Public Schools
Pre-Calculus

Pre-Calculus
Sayreville War Memorial High School
Full Year Course

For adoption by all regular education programs as specified and for adoption and adaptation for all special education students, English language learners, at-risk students and talented and gifted students in accordance with Board of Education Policy # 6171.

Date Curriculum Approved/ Revised: November 2012

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TOPIC/SELECTION	TIME	OBJECTIVE	ACTIVITY	BENCHMARK ASSESSMENT	NJSLS
Real numbers: Properties and Applications	1 day	1. Order real numbers and distinguish between rational and irrational numbers. 2. Graph one variable equations and inequalities. Identify and apply basic rules of algebra. 3. Apply the properties of negative, zero, fractions and equality.	focus - number line calculator Have students write a short paragraph describing rational numbers and irrational numbers. Specifically focus on radical 2 and then fractional values such as 140/99 which is very close to the value of radical 2, to use a comparison.	Have verbal class discussion to ensure that students understand basic terminology and actions such as factors, divisors, prime numbers, composite numbers, etc.	N – RN (3)
Exponents and Radicals	2 day	1. Apply the laws and properties of exponents. 2. Convert scientific notation Û decimal notation. 3. Define and simplify rational exponents. 4. Identify and apply properties of radicals	Use discovery made by Johannes Kepler and the relationship of distance to the planets in our solar system and the sun to show the relationship through radicals.	Have students hand in completed table of the radical relationships. Monitor student progress through activity by circulating the room	N – RN (1;2)
Polynomials and Factoring	1 day	1. Identify and classify polynomials. 2. Perform operations with polynomials. 3. Factor special products and general polynomials.	Foil method Graphing calculator Three Dimensional View of a Special Object: Present students with an image of 3D cube (smaller inside of a larger). If the smaller is removed from the larger the remaining solid has a very specific volume. Find the volume of each box and describe how these volumes are related to the special product formula.	Have students work in groups to complete task. Monitor student success by circulating room.	A – APR (1; 6; 7)

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Fractional Expressions	1 day	1. Determine domain of a function. 2. Simplify rational expressions. 3. Perform operations with rational expressions.	Students will complete a table by evaluating an expression but in two parts. Students will look at the numerator and denominator separately to show how each can change differently.	Have students hand in table to check for understanding.	A – APR (6; 7)
Equations	2 days	1. Solve linear equations 2. Quadratic equations 3. Polynomial equations of higher degree 4. Radical equations. 5. Absolute value equations	Use graphing calculator to find point of intersection of a system of equations Give students 2 different types of equations and have students write a step by step set of instructions of how to solve the problem.	Equation Relay Race Game	A – REI (1; 2; 3; 4)
Inequalities	2 1/2 days	1. Apply properties of inequalities. 2. Solve linear inequalities. 3. Solve absolute value inequalities. 4. Solve polynomial inequalities.	number line Discuss properties of inequalities and translate them from mathematical statements into verbal statements. Illustrate properties graphically on a number line. Use a numerical approach to maximize the volume of a rectangular prism	Assessment of material	A – REI (1; 2; 3; 4)
Graph Equations	1 day	1.Graph an equation by a) setting up a t-chart b) determining and plotting intercepts 2. Recognize symmetry over the x-axis, y-axis and the origin	Using the graphing calculator students will use the zoom and trace features to approximate intercepts and there for find the symmetry of a graph	Students will complete an exit card testing for symmetry algebraically.	A-REI (1011;12)

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Linear Functions	1 day	1. Graph a linear function using a. the slope/intercept method b. x and y intercepts 2. Write an equation given a. 2 points b. point/slope c. x and y intercepts 3. Determine the slope of a line	T-charts G calculator Activity: Use linear functions to represent depreciation and modeling linear data	Students will pair off and present various problems to class to check for understanding.	A-REI (1011;12)
Parallel and Perpendicular Lines	1 day	1. Identify parallel and perpendicular lines	graph paper G calculator Have students construct tables modeling linear data	Exit card problem	G – GPE (5)
Function Notation	1 day	1. Define and recognize a function. 2. Differentiate between functions and relations. 3. Utilize function notation. Evaluate functions	Worksheet 1.3-1 : Evaluating Functions calculator Activity: Use function notation to represent cost, revenue, profit; i.e. cost analysis	Students will create functions and evaluations and exchange with other students to evaluate each other's progress	F-IF (1;2;3)
Domain of a function	3 days	1. Determine domain of a function a. restrictions occur when there are rational expressions with variable in the denominator b. radicals with an even root index. 2. Recognize relationships between domain and range of a function. 3. Identify domain from a graph.	Worksheet 1.3-2 : Domain of a Function Graphing calculator exploration exercise comparing two similar graphs. Have students find visually the domain of both graphs. Do the domains of the functions overlap? If so, for what values?	Students will verbally explain domain through graph referral. Students will list overlapping domains and identify the values Assessment of Material	F-IF (1;2;3)

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Graph of a function	3	1. Graph a function using t-charts or zeros 2. Identify open/closed endpoints, increasing, decreasing, constant step-functions, & piece-wise functions 3. Utilize vertical line test. 4. Graph linear functions when domain is altered.	Worksheet 1.4-1 : Graphing the 6 Major F(x)'s graph paper, straight edge G calculator Use step functions to model cost of mail, telephone calls. Activity: use a graphing calculator to determine minimum and maximum values of a function over a closed interval.	Check students work by circulating the room. Students will recreate graphs on Smart Board. Test of material learned thus far.	F-IF (4;5;6)
Translations and Combinations	4 days	1. Shift, reflect, and stretch or shrink graphs. 2. Perform operations with functions.	Electronic keyboard to demonstrate alternate method for indicating transformations of a function. Use transparency paper to investigate shifts of graphs including reflection, rotation, and translation	Circulate the room to see student understanding. Assessment of material	F-IF (8;9)
Composition of Functions	2 days	1. Find compostion of two functions. 2. Show mapping of composition. 3. Recognize that composition is not commutative.	Students will create diagrams (illustrations) modeling different types of compositions using transparency paper. When one piece of paper is overlapped to the other students will visually see how the composition is formed.	Circulate room to monitor student success.	F – BF (1; 2; 3)
Inverse Functions and assessment	4 days	1. Recognize inverse functions. 2. Determine inverse of a function a. given ordered pairs b. given an equation c. given a graph 3. Verify inverse functions. 4. Graph inverse functions and apply symmetry. 5. Apply horizontal line test	Worksheet: 1.6-1 : Finding Inverse Functions G calculator Use a graphical approach to maximization problems. Depending on the time of year, have students write a set of instructions for carving a pumpkin or decorating a Christmas tree, etc. Students will then put steps in reverse opposite order to model in verse function.	Have student create own set of steps and reverse opposite steps for another systematic process to ensure retention.	F – BF (4)

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Quadratic Functions	2 days	1. Graph quadratic function 2. Apply transformations. 3. Evaluate zeros, max and min points.	Group activity Quadratic Modeling. Create a scatter plot using a given set of information. Have students find the quadratic modeling of the data.	Students will create tables to show key elements of quadratic functions. Test of material	F-IF (7;8)
Function Analysis Continuous/Discontinuous Functions and assessment	5 days	1. Distinguish between continuous and discontinuous functions. 2. Determine domain and indicate domain restrictions (if any). 3. Write domain in set notation and/or interval notation. 4. Graph continuous functions. 5. Graph discontinuous functions both removable and non-removable.	Worksheet 2.1-1 : Graph Behavior graph paper G calculator Grapher puzzle	Students will re-create graphs using Smart Board. Students will complete graded assignment.	F-IF (1.a;b)
Limits and assessment	13 days	1. Identify asymptotes from domain restrictions. 2. Recognize when a limit does/does not exist. 3. Determine limit of a function	G calculator Activity: Investigate sums of series such as 1 + 1/2 + 1/3 + … or 1/1! + 1/2! + 1/3! ... Worksheet L1: Graph Referral Worksheet L2: Graph Referral 2 Worksheet L3: Graph Referral 3 Worksheet L4: Direct Substitution 1 Worksheet L5: Direct Substitution 2 Worksheet L6: Limits at Infinity	Students will be able to observe approachment of graphs by following left and right patterns Quiz on material. Students will be able to discuss the concept of infinity and apply it both graphically and algebraically. Quiz on material. Students will be able to apply algebraic concepts of factoring and evaluating to apply direct substitution of a limit. Assessment of material.	F-IF (4;7;8;9) F-LE (1;2;3;4)

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TOPIC/SELECTION	TIME	OBJECTIVE	ACTIVITY	BENCHMARK ASSESSMENT	NJSLS
Exponential Functions	1 day	Recognize and graph exponentential functions.	G calculator Activity: students investigate patterns of growth such as compound interest with graphing calculator	Students will turn in completed chart from activity	F-BF (5)
Model Exponential Functions	1 day	Use exponential functions to model "real world" problems such as compound interest, radio active decay, etc.	G calculator Activity: students can model decay in a bacterial culture by cutting a sheet of paper in 1/2 and calculating and recording the area. Graph the number of cuts vs. the area to see an example of exponential decay.	Students will turn in completed graphs from activity	F-BF (5)
Natural Logarithm "e"	2 days	Identify, evaluate and graph the natural exponential function "e"	Worksheet: Base “e” Exploration activity using Continuous Compounding formula change compounding by days, hours, minutes, and seconds.	Students will complete graphs by hand	F-IF (7.e)
Common and Natural Logarithmic Functions	3 day	1. Define log/ln functions and use the properties of logs/lns. 2. Convert from logarithmic functions ⇔ exponential functions using the circular pattern. 3. Evaluate logs/lns. 4. Graph common and natural logarithms. 5. Determine domain, range, intercepts and asymptotes.	Worksheet : Evaluating Logarithms calculator Activity: Use exponential functions to compare various savings plans, effective yield.	Students will complete chart showing the comparison of the activity. Students will be given a logarithmic function verbally and will convert to exponential form. Student will be given an exponential function verbally and will convert to logarithmic form.	F-IF (8.b)
Change of Base	1/2 day	Use the change of base formula	Worksheet: Applying Change of Base	Circulate room to ensure students understanding of material	F-IF (8.b)

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Laws of Logs/Lns	2 1/2 days	1. Identify laws of logs/lns. 2. Relate laws of logs/lns to laws of exponents. 3. Expand/condense logs/lns.	Use a graphing calculator to graph a ln function in expanded form and using properties on same view screen. Are functions in the same domain?	Quiz of material. Written explanation of domains of functions.	F-IF (8.b)
Inverse of logs/lns	1 day	Recognize that logs/lns and exponential functions are inverses of each other.	Proof of inverse by graphing on same plane and proving using inverse properties	Students will graph additional logarithms to prove inverse.	F-IF (8.b)
Exponential Equations	2 days	Solve exponential equations.	Worksheet: Equations of Exponential form calculator	Students will do problems on the board so instructor can check for understanding.	F-BF (5)
Log/ln Equations	3 days	Solve both common and natural logarithmic equations.	Group activity comparing mathematical models. Using scatter plots and linear models. Have students create a new table giving values for ln x and ln y and create a new scatter plot of transformed data.	Review of materials learned for assessment	F-BF (5)
Applications of logs/lns	1 day	Use log/ln equations to model real world problems such as investments, consumer price index, earthquakes, growth and decay, etc.	Worksheet: Review of Logarithms G calculator	Test of material	F-BF (5)
Distance and Midpoint of a line segment	1 day	1. Determine length of a line segment. 2. Determine midpoint of a line segment.	SM Activity: Students use coordinate geometry to determine distance between two points	Meet with each group to ensure retention	G – GPE (6; 7)
Analytic/Coordinate Geometry	2 days	Use algebra to prove geometric definitions and theorems	SM graph paper Use circles, properties of various quadrilaterals and coordinate geometry to prove geometry theorems.	Exit Card of Material	G – GPE (6; 7; 8)

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Conics	1 day	1. Recognize conics as the intersection of a plane and a cone. 2. Identify the various conic sections.	Construct cones by cutting a wedge-shaped sector from a circle and tape the edges together. Investigate which cones generate the greatest volume.	Have students work with various conic sections available in room.	G - GPE
Circle	4 days	1. Graph a circle given the center and the radius. 2. Determine the equation of a circle given the graph or center/radius. 3. Convert from circle notation ⇔ expanded notation. 4. Recognize correlation between general circle equation and Pythagorean Theorem	SM graph paper G calculator Worksheet Conic #1 – Equations of Circles Prove definition by using paddy paper and ruler. Using focus, directrix and drawing tangent lines and folding students will form conic section on paddy paper	Quiz on material	G – GPE (1)
Ellipse	4 days	1. Define and identify the characteristics of an ellipse. 2. Graph an ellipse given various characteristics. 3. Write the equation of an ellipse given various characteristics. 4. Convert from ellipse notation ⇔ conic notation. 5. Recognize how eccentricity affects the shape of the ellipse.	graph paper Worksheet Conic # 2&3 – Expanding and Contracting the Equation of an Ellipse; Forming the Equation of the Ellipse Prove definition by using paddy paper and ruler. Using focus, directrix and drawing tangent lines and folding students will form conic section on paddy paper	Quiz on Material	G – GPE (3)

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Hyperbola	4 days	1. Define and identify characteristics of a hyperbola. 2. Graph a hyperbola given various characteristics. 3. Write the equation of a hyperbola given various characteristics. 4. Convert from hyperbola notation ⇔ conic notation.	graph paper Conic Worksheet #4&5 - Expanding and Contracting the Equation of an Hyperbola; Forming the Equation of the Hyperbola Prove definition by using paddy paper and ruler. Using focus, directrix and drawing tangent lines and folding students will form conic section on paddy paper Apply properties of hyperbolas to model real-world problems such as a radar detection system and microphone placement.	Quiz on Material	G – GPE (3)
Parabola	4 days	1. Define and identify characteristics of a parabola. 2. Graph a parabola given various characteristics. 3. Write the equation of a parabola given various characteristics. 4. Convert from parabola notation ⇔ conic notation.	graph paper SM G calculator Use graphing calculator to investigate how changing coefficients affect the graph. Activity: Discuss why television antenna dishes are parabolic in shape Prove definition by using paddy paper and ruler. Using focus, directrix and drawing tangent lines and folding students will form conic section on paddy paper	Quiz on Material	G – GPE (2)

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Applications of Parabola	1 day	Apply properties of parabolas to model real-world problems such as satellite antenna, suspension bridges, automobile headlights, highway design, path of a projectile, etc.	G calculator Alternate activity - draw a snowman utilizing all 4 conics.	Complete unit assessment of all conic sections	G – GPE (2)
Angles in Standard Position	2 days	1. Define angle in standard position, initial side, terminal side. 2. Distinguish between negative and positive angles. 3. Find coterminal angles.	Worksheets 1-5, 1-6: Simplifying Angles Group activity using a standard combination lock. Choose a 3 number combination, without revealing the combination describe to you partner how to turn the dial in terms of degree measure to open the lock. Each angle measure should be given in standard position from the pointer. Switch roles and use radians to describe the combination.	Students will calculate combinations and check for understanding. Students will draw a coordinate plane labeling three different angles in each quadrant.	G-C (1;2;5)
Radian Measure	3 days	1. Define radian in terms of the measure of a central angle of a circle. 2. Find and sketch coterminal angles in terms of radians. 3. Find complementary and supplementary angles in radians.	Worksheet 1-7: Converting Radian Measure Physically have students measure the arc length of various circular objects so students are comfortable applying radian measure.	Students will demonstrate understanding by completing problems on board. Exit card on coterminal angles.	F-TF (1;2) G-SRT (7)
Degree Measure	2 days	1. Define degrees in terms of a central angle of a circle. 2. Convert from radians to degrees. 3. Convert from degrees to radians.	G calculator to convert between radians and degrees Worksheet 1-8 : Converting Degree Measure	Students will show understanding of conversion factor by completing additional problems	F-TF (1;2)

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Applications of Radian and Degree Measure	2 days	1. Apply the measures of radians and degrees to real world problems. 2. Apply radian measure to speed and angular speed problems.	G calculator to solve problems	Group presentations of different problems. Assessment of material.	F-TF (1;2)
The Unit Circle	2 days	1. Describe all parts of the unit circle in terms of x, y, t and θ. 2. Find x and y coordinates of important radian values around the unit circle.	9 inch paper plate, ruler, and protractor to create unit circle. Recreation activity using entire class to perform the unit circle. (Kitty Morgan)	Instructor will complete first quadrant with students. Students through guided practice with complete second quadrant. Students will complete quadrants three and four.	F-TF (1;2;3)
The Trigonometric Functions	3 days	1. Define the 6 trigonometric functions in terms of t, x and y. 2. Identify reciprocal trigonometric functions. 3. Evaluate trig functions of any arc length on the unit circle.	Worksheet 1-15: Functions of Any Angle Error Analysis. Give students the following scenario: Suppose you are tutoring a student who is asked to evaluate the cosine of 2 radians and using the calculator obtains the answer 0.999390827. You know this is wrong, why and how do you correct it?	Students will write response to Error Analysis. Instructor will read responses to check for understanding.	F-TF (1;2)
Domain and Period of Sine and Cosine	2 days	1. Define a periodic function. 2. Determine even versus odd functions. 3. Describe the period of the sine and cosine functions. 4. Use the period to evaluate sine and cosine.	Using graphing calculator in radian and parametric modes enter both the sine and cosine basic graphs. Have students use particular settings. Use trace key to move the cursor around graph. What do the values represent? What are the smallest and largest values?	Students will describe values found on calculators. Students will be able to distinguish the difference between smallest and largest values.	F-TF (2;3;4)
Evaluating Trigonometric Functions with a Calculator	1 day	Evaluate the 6 trig functions using a calculator.	G calculator to evaluate trig functions Worksheet 1-17: Evaluating Trig Functions with the Calculator	Students will be given additional problems for guided practice. Assessment of material	F-TF (2;3;4)

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The Six Trigonometric Functions (in terms of the right triangle)	3 days	1. Define the 6 trig functions in terms of hypotenuse, opposite and adjacent sides of a right triangle. 2. Evaluate the 6 trig functions using given parts of a right triangle.	G calculator to evaluate trig functions Worksheet 3-1: Right Triangle Trigonometry	Student presentation of particular problems.	F-TF (3)
Trigonometric Identities	2 days	Apply the fundamental trigonometric identities to solve for the missing parts in a right triangle.	Group activity. Some trig functions have the property f(cx) = cf(x), which trig functions have this property? Also give students 6 examples that model this property, use the results to justify your answer.	Students will be given additional problems. Check students work for understanding.	F-TF (9)
Applications Involving Right Triangles	3 days	Solve real world problems using right triangle definitions of trig functions.	Graphing calculator to solve word problems Worksheets 3-3, 3-5: Right Triangle Trig and Real World Applications Student presentations in group setting of problems.	Assessment of material	G-SRT (8)
Definitions of Trigonometric Functions of Any Angle	2 days	1. Evaluate trig functions of any angle. 2. Evaluate trig functions of quadrant angles.	Worksheet 1-11: Defining Angles Use graphing calculator to verify values.	Students will be given additional problems for guided practice.	G-SRT (6)
Reference Angles	2 days	Find reference angles.	Have students sketch several angles with their corresponding reference angles to reinforce the reference angle is the acute angle formed with the horizontal. Worksheet: The Reference Angle Problem	Students will be given an angle to graph in standard position and find the reference angle	G-SRT (5)

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Trigonometric Functions of Real Numbers	3 days	1. Evaluate trig functions of any angle. 2. Find trig values of common angles. 3. Evaluate trig functions of nonacute angles. 4. Use a calculator to find trig values of angles.	Graphing calculator to evaluate trig functions Worksheet 1-13: Using the Calculator Group activity comparing patterns in the 6 trig functions. Have students complete a table identifying the domain, range, period, zeros, and if the function is even/odd. Have students discuss and inherent patterns, what can you conclude?	Check students' tables for understanding. Classroom discussion of patterns. Assessment of material.	F-TF (2)
Basic Sine and Cosine Curves	2 days	1. Graph sine and cosine curves by hand using key points. 2. Identify the maximums, minimums, and intercepts of the sine and cosine curves. 3. Verify graphs using a graphing calculator.	G calculator to graph sine and cosine curves paying special attention to the viewing rectangle used. Have students graph a large function in the standard viewing rectangle. Students will observe that they are unable to see graph. Have students use the zoom feature to find a viewing rectangle that displays a good view of the graph.	Students will be given additional functions to graph for understanding. Circulate the room while students are using calculators.	F-TF (5)
Amplitude and Period	3 days	1. Define amplitude and period of sine and cosine curves. 2. Determine types of vertical and horizontal stretching and shrinking based on the equation for a function.	G calculator to investigate effects of amplitude and period changes on graphs Worksheet 2-5, 2-7: Graphing Sine and Cosine; Graphing Sine and Cosine with Shifts	Students will be given additional functions to graph for understanding. Have students graph problems on Smart Board to check for understanding.	F-TF (5;6)
Translations of Sine and Cosine Curves	2 days	1. Identify types of horizontal and vertical translations based on the equation of the sine or cosine function. 2. Use a calculator to show the translation for each function.	GC to investigate effects of horizontal and vertical translations to sine and cosine curves using the same base function but changing the effect of the shift.	Students will be given additional functions to graph for understanding. Exit card.	F-TF (5;6)

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Graph of the Tangent and Cotangent Functions	2 days	1. Identify the domain, range, period, and asymptotes for the tangent and cotangent functions. 2. Sketch a graph of the tangent and cotangent functions.	G calculator to graph tangent and cotangent Worksheet 2-11: Graphing the Tangent Functions	Students will be given additional functions to graph for understanding.	F-TF (5;6)
Graphs of the Reciprocal Functions	2 days	1. Identify the domain, range, period, and asymptotes for the secant and cosecant functions. 2. Sketch a graph of the secant and cosecant functions.	G calculator to graph secant and cosecant Worksheet 2-13 : Graphing Reciprocal F(x)'s Group Activity combining trig functions. See if the students can find combinations such that f(x) + g(x) = 0.	Students will be given additional functions to graph for understanding. Assessment of material.	F-TF (5;6)
Inverse Sine Function	1 day	1. Find the domain and range of the inverse sine function. 2. Interchange the terms inverse sine and arcsine. 3. Evaluate the inverse sine functions.	G calculator to graph inverse sine function Worksheet 6-3: Evaluating Inverse Sine	Students will be given problems orally and students will use chart to find specific answer.	F-TF (7)
Other Inverse Trig Functions	3 days	1. Define and find the domain and range of the inverse cosine and tangent function. 2. Sketch graphs for the inverse trig functions. 3. Evaluate inverse trig functions by hand and on the calculator.	G calculator to graph inverse cosine and tangent functions Give students two columns consisting of 8 different possible inverse pairs. Have students verify each pair algebraically, graphically, and numerically.	Students will be given problems orally and students will use chart to find specific answer. Exit Card	F-TF (6)
Composition of Functions	1 day	Evaluate compositions of trig functions and inverse trig functions.	G calculator to evaluate compositions of trig functions	Assessment of material.	F-BF (4.a)

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Using Fundamental Identities	4 days	1. Use identities to evaluate a function. 2. Simplify trigonometric expressions. 3. Factor trig expressions. 4. Verify trig identities. 5. Rewrite trig expressions.	Worksheet 3-7: The Trig Identities Group Activity deriving the identities for secant and tangent. .	Classroom discussion on easier ways to remember the identities. Quiz on material.	F-TF (8)
Verifying Trigonometric Identities	4 days	1. Verify trig identities. 2. Combine fractions involving identities.	Worksheet 3-11: Using Identities to Verify Expressions Group Activity error analysis of an identity that was verified only graphically not algebraic.	Students will correct the error and explain. Guided practice during classroom time. Additional examples for extra practice. Quiz on material.	F-TF (9)
Solving Trigonometric Equations	2 days	1. Solve trig equations. 2. Use factoring to solve trig equations.	Worksheets 6-9, 6-10: Solving Trig Equations 1 and 2 Use graphing calculator to verify algebraic answers	Guided practice during classroom time. Additional examples for extra practice. Exit Card.	F-TF (8;9)
Equations of Quadratic Type	2 days	1. Factor a quadratic type trig equation. 2. Convert an equation to quadratic type.	Procedurally have students write or visualize the algebraic model, rewrite the corresponding trig equation in terms of a single trig function then solve for x.	Guided practice during classroom time. Additional examples for extra practice. Assessment of material.	F-TF (8;9)
Functions Involving Multiple Angles	2 days	Solve an equation involving a multiple angle solution.	Check solutions with a graphing calculator demonstrating multiple solutions.	Students will use previous learned material to further solve equations.	F-TF (8;9)

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Using Inverse Functions	2 days	Use the inverse trig functions to solve a trig equation.	Group Activity Equations with no solution. Give students 3 equations of which only one has solutions.	Have students discover the conditions that will guarantee the equation will have at least one solution. Quiz on material.	F-BF (4.a,b,c)
Law of Sines	4 days	1. Determine when to use the law of sines. 2. Use the law of sines to solve oblique triangles.	Worksheet 4-1, 4-3: Evaluating Oblique Triangles Using Law of Sines Activity: Can the law of sines also be used to solve right triangles?	Students will write a short paragraph explaining how to use the law of sines to solve two provided triangles. Students will discuss possible easier ways to solve for the missing parts of the triangle. Exit Card.	G-SRT (10)
Area of Oblique Triangles	2 days	Find the area of an oblique triangle when two sides and one angle are given.	Encourage students to draw diagrams depicting the given scenario in the area problem. Worksheet 4-9: To Find the Area of a Triangle	Students will label all parts and use the calculator to verify answers. Exit Card	G-SRT (9)
Law of Cosines	4 days	1. Determine when to use the law of cosines. 2. Use the law of cosines to solve oblique triangles. 3. Apply the law of cosines to solve real world problems.	Worksheet 4-5: Application of Law of Cosines Activity comparing the use of law of sines and cosines.	Students will determine which approach is better for given situations. Students will construct table describing all groupings of triangles and situations to use appropriate ratio set-up. Exit card.	G-SRT (10)

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Heron's Formula	1 day	Find the area of an oblique triangle when given the lengths of three sides.	Activity: With the addition of this formula students have learned 3 different ways to find the area of a triangle. Students will be given various triangles where they will apply the most appropriate formula for the given information.	Check students' computations. Assessment of material.	G-SRT (11)