TRIGONOMETRY AND PRECALCULUS CURRICULUM

Course 17008

Students taking this course will concentrate on algebraic concepts and trigonometric applications. The use of graphing calculators and other technologies is emphasized as a problem-solving strategy. This course is highly recommended for students planning to attend college.

TRIGONOMETRY AND PRECALCULUS OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
• Analyze and interpret functions algebraically, graphically, numerically and verbally. • Define trigonometric functions using right triangles. Model real world problems using right triangles, the Law of Sines, and the Law of Cosines. • Define, graph and analyze circular functions in degrees and radians. • Verify trigonometric identities, solve trigonometric equations and model and solve really world situations using trigonometric equations. • Define polar coordinates and complex numbers and connect them to trigonometric functions. • Define and use arithmetic and geometric sequences and series, understand the concept of a limit. Model and solve real world situations using sequences and limits.	• Students will be able to analyze the behavior of functions and their graphs and produce functions that model relationships between two quantities. • Model real world situations using logarithmic and exponential functions by drawing and analyzing graphs and finding inverse functions. • Students will be able to model data using exponential, logarithmic and logistic functions, apply properties of logarithms, and solve logarithmic and exponential equations. • Students will be able to verify trigonometric identities and solve trigonometric equations. • Students will be able to use trigonometric functions to solve right triangles, use the Law of Sines and the Law of Cosines to solve general triangles, find values of trigonometric functions of any angle, and graph trigonometric and inverse trigonometric functions.	Mid-year and End of Year Benchmark Assessments,	1-year	Glencoe Precalculus ©2014

TRIGONOMETRY AND PRECALCULUS MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Weeks 1-3 Chapter 1	• Functions can be manipulated in infinitely many ways that can help us to model situations. From these models, we can analyze the past to predict the future.	1-1: Functions 1-2: Analyzing Graphs of Functions and Relations 1-3: Continuity, End Behavior, and Limits 1-4: Extrema and Average Rates of Change 1-5: Parent Functions and Transformations Extend 1-5: Graphing Tech Lab: Nonlinear Inequalities 1-6: Function Operations and Compositions of Functions 1-7: Inverse Relations and Functions Extend 1-7: Graphing Tech Lagb: Graphing Inverses Using Parametric Equations	• How can mathematical ideas be represented? Sample answer: You can represent mathematical ideas verbally, algebraically, numerically and graphically. For example, a function can be described in words or could be represented by an equation, a table of values, or a graph. • How are symbols useful in mathematics? Sample answer: Symbols allow you to express mathematical concepts in a condensed form. • How does understanding parent functions and transformations help you to represent mathematical ideas and analyze real-world situations? Sample answer: Understanding the relationship between parent functions allows you to choose an appropriate function that could be used to represent a real-world situation. • What characteristics of functions can help you analyze real-world situations?	A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. A1.2.1.1.2 Determine if a relation is a function given a set of points or a graph. A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).	1-1 • Describe subsets of real numbers • Identify and evaluate functions and state their domains 1-2 • Use graphs of functions to estimate function values • Identify even and odd functions 1-3 • Use limits to determine the continuity of a function • Use limits to describe the end behavior of functions 1-4 • Find intervals on which functions are increasing, constant, or decreasing • Determine the average rate of change of a function 1-5 • Identify, graph, and describe parent functions • Identify and graph transformations of functions Extend 1-5 • Use a graphing calculator to solve nonlinear inequalities 1-6	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			Explain. Sample answer: End behavior represents future behavior; critical points represent maximum and minimum values; average rates of change represent speeds and other changes.	A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A1.2.2.1.1 Identify, describe and/or use constant rates of change. A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems. A1.2.2.1.3 Write or identify a linear equation when given the graph of the line 2 points on the line, or the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form). A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph.	• Perform operations with functions • Find compositions of functions 1-7 • Use the horizontal line test to determine whether a function has an inverse function • Find inverse functions algebraically and graphically Extend 1-7 • Use a graphing calculator and parametric equations to graph inverse functions on the calculator		

				A1.2.2.2.1 Draw, find and/or write an equation for a line of best fit for a scatter plot. A2.1.3.1.1 Write and/or solve quadratic equations (including factoring and using the Quadratic Formula). A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., $10/(x + 3) + 12/(x – 2) = 1$ or $\sqrt{}(x2 + 21x) = 14$). A2.1.3.1.3 Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms). A2.1.3.1.4 Write, solve and/or apply linear or exponential growth or decay (including problem situations). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., $y=4/x$, if x doubles, what happens to y?).			

				A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. A2.2.1.1.2 Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial			

				function (including quadratics). A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms). A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.3 Write functions or			

				sequences that model relationships between two quantities. CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.6 Interpret functions in terms of the situation they model.			
Weeks 3-6 Chapter 2 Power, Polynomial, and Rational Functions	• Although math can be used to model almost anything in life, you must be extremely careful that your math does EXACTLY what you want it to do.	2-1: Power and Radical Functions Explore 2-2: Graphing Tech Lab: Behavior of Graphs 2-2: Polynomial Functions Extend 2-2: Graphing Tech Lab: Hidden Behavior of Graphs 2-3: The Remainder and Factor Theorems 2-4: Zeros of Polynomial Functions 2-5: Rational Functions 2-6: Nonlinear Inequalities	• Why is mathematics used to model real-world situations? Sample answer: in order to study trends, make predictions, understand phenomena in nature • When would a nonlinear function be used to model a real-world situation? Sample answer: When the relationship that is modeled has a rate of change that is not constant, and thus, is nonlinear. • What are the advantages of modeling real-world situations using polynomial functions? Sample answer: They have well-known and understood properties; there are multiple models that can be considered within the same	A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. A1.2.1.1.2 Determine if a relation is a function given a set of points or a graph. A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table). A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A1.2.2.1.1 Identify, describe and/or	2-1 • Graph and analyze power functions • Graph and analyze radical functions and solve radical equations Explore 2-2 • Graph and analyze the behavior of polynomial functions 2-2 • Graph Polynomial Functions • Model Real-World Data with Polynomial Functions 2-3 • Divide Polynomials using long division and synthetic division • Use the Remainder and Factor Theorems 2-4 • Find Real Zeros of Polynomial Functions • Find Complex Zeros of Polynomial	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			family of functions; the computation that is done to make predictions is relatively easy to perform. • What are the limitations of mathematical modeling? Sample answer: Not all real-world situations can be modeled. For those that can be modeled, predictions that are made using the model may not be accurate when based on data values that are outside the range of data values used to create the model. Therefore, after a model is created, it should be carefully analyzed before it is used to make predictions/decisions	use constant rates of change. A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems. A1.2.2.1.3 Write or identify a linear equation when given the graph of the line 2 points on the line, or the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form). A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph. A1.2.2.2.1 Draw, find and/or write an equation for a line of best fit for a scatter plot. A2.1.3.1.1 Write and/or solve quadratic equations (including factoring and using the Quadratic Formula). A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., $10/(x + 3) + 12/(x – 2) = 1$ or $\sqrt{(x2 + 21x)} = 14$). A2.1.3.1.3 Write and/or solve a simple exponential or logarithmic equation (including common and	Functions 2-5 • Analyze and graph rational functions • Solve Rational Equations 2-6 • Solve Polynomial Inequalities • Solve Rational Inequalities		

				natural logarithms). A2.1.3.1.4 Write, solve and/or apply linear or exponential growth or decay (including problem situations). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. A2.2.1.1.2 Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of			

				increasing/decreasing, intercepts, zeros, and asymptotes). A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics). A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms). A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.			

				CC.2.2.HS.C.6 Interpret functions in terms of the situation they model.			
Weeks 6-9 Chapter 3	• Making good decisions means considering ALL parts of the situation in which you're making a decision. In math, this means considering our models IN CONTEXT	3-1: Exponential Functions Extend 3-1: Graphing Tech Lab: Financial Literacy: Exponential Functions 3-2: Logarithmic Functions 3-3: Properties of Logarithms 3-4: Exponential and Logarithmic Equations Extend 3-4: Graphing Tech Lab: Solving Exponential and Logarithmic Inequalities 3-5: Modeling with Nonlinear Regression	• How do you make good decisions? Sample answer: Determine the available options, compare the advantages/disadvantages of each option, analyze the consequences, and choose the best option. • What factors can affect good decision making? Sample answer: the amount of time that is available, the process used, the environment, the people involved, the options that are available • How can mathematical models be used to help you make good decisions? Sample answer: Mathematical models can be used to compare different options that are available, as well as to predict the impact of an option if it is chosen. • What factors must be considered when using exponential and logarithmic models to make decisions? Sample answer: Exponential and logarithmic models can grow	A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A1.2.2.1.1 Identify, describe and/or use constant rates of change. A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems. A1.2.2.1.3 Write or identify a linear equation when given the graph of the line 2 points on the line, or the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form). A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph. A1.2.2.2.1 Draw, find and/or write an equation for a line of best fit for a scatter plot.	3-1 • Evaluate, analyze, and graph exponential functions • Solve problems involving exponential growth and decay Extend 3-1 • Calculate future values of annuities and monthly payments 3-2 • Evaluate expressions involving logarithms • Sketch and analyze graphs of logarithmic functions 3-3 • Apply properties of logarithms • Apply the Change of Base Formula 3-4 • Apply the One-to-One Property of Exponential Functions to solve equations • Apply the One-to-One Property of Logarithmic Functions to solve equations Extend 3-4 • Solve Exponential and logarithmic inequalities algebraically and graphically 3-5 • Model data using	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			without bound, which is usually not the case in the situation being modeled. For instance, a population cannot grow without bound due to space and food constraints. Therefore, when using a model, the situation that is being modeled should be carefully considered when making decisions	A2.1.3.1.1 Write and/or solve quadratic equations (including factoring and using the Quadratic Formula). A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.1.3 Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms). A2.1.3.1.4 Write, solve and/or apply linear or exponential growth or decay (including problem situations). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically.	exponential, logarithmic, and logistic functions • Linearize and analyze data		

				A2.2.1.1.2 Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics). A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms). A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or			

				logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.5 Construct and compare linear, quadratic and exponential models to solve problems. CC.2.2.HS.C.6 Interpret functions in terms of the situation they model.			
Weeks 10-13 Chapter 4	• Trigonometric functions can be used in many of the same ways as other types of functions, but they're often better for modeling relationships that repeat.	4-1: Right Triangle Trigonometry 4-2: Degrees and Radians 4-3: Trigonometric Functions on the Unit Circle Explore 4-4: Graphing Tech Lab: Graphing the Sine Function Parametrically 4-4: Graphing the Sine and Cosine Functions Extend 4-4: Graphing Tech Lab: Sums and	• Why are graphs useful? Sample answer: Graphs are useful because they can help you to visualize relationships between real-world quantities. They can also be used to estimate function values. • How can graphs of trigonometric functions be useful? Sample answer: They can be used to model real-world situations involving periodic behavior such as tides and harmonic motion,	A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A2.1.3.1.1 Write and/or solve quadratic equations (including factoring and using the Quadratic Formula). A2.1.3.1.2 Solve equations involving rational and/or	4-1 • Find values of trigonometric functions for acute angles of right angles • Solve right triangles 4-2 • Convert degree measures of angles to radian measures and vice versa • Use angle measures to solve real-world problems 4-3 • Find values of trigonometric functions for any angle • Find values of trigonometric	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

		Differences of Sinusoids 4-5: Graphing other Trigonometric Functions 4-6: Inverse Trigonometric Functions 4-7: The Law of Sines and the Law of Cosines	and they can be used to make predictions. • How can writing angle measures in different ways be useful? Sample answer: Writing angle measures in degrees is useful when solving problems without linear measures, while writing angle measures in radians is useful when solving problems with linear measures. • How are transformations of sine and cosine functions similar to transformations of other functions you have studied? Sample answer: Adding or subtracting to any function translates the graph; multiplying a function dilates the graph; multiplying a function by a negative number reflects the graph. • How does an inverse trigonometric function compare to an algebraic inverse function? Sample answer: Like an algebraic inverse, an inverse trigonometric function undoes a trigonometric function, its graph is a reflection of the function graph in the line y = x, and the	radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.1.3 Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms). A2.1.3.1.4 Write, solve and/or apply linear or exponential growth or decay (including problem situations). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics). A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms). A2.2.2.1.3 Determine, use and/or	functions using the unit circle Explore 4-4 • Use a graphing calculator and parametric equations to graph the sine function and its inverse 4-4 • Graph transformations of the sine and cosine functions • Use sinusoidal functions to solve problems Extend 4-4 • Graph and examine the periods of sums and differences of sinusoids 4-5 • Graph tangent and reciprocal trigonometric functions • • Graph damped trigonometric functions 4-6 • Evaluate and graph inverse trigonometric functions • Find compositions of trigonometric functions 4-7 • Solve oblique triangles by using the Law of Sines or the Law of Cosines • Find areas of oblique triangles		

			domain must be restricted in order to be a function.	interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.7 Apply radian measure of an angle and the unit circle to analyze the trigonometric functions. CC.2.2.HS.C.8 Choose trigonometric functions to model periodic phenomena and describe the properties of the graphs. CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios. G.1.3.2.1 Write, analyze, complete, or identify			

				formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction). G.2.1.1.1 Use the Pythagorean Theorem or trigonometric ratios to write and/or solve problems involving right triangles. G.2.1.1.2 Use trigonometric ratios to write and/or solve problems involving right triangles.			
Weeks 13-15 Chapter 5	• Knowing when and how to use identities can be the key to solving problems more easily, or at all.	5-1: Trigonometric Identities 5-2: Verifying Trigonometric Identities 5-3: Solving Trigonometric Equations Extend 5-3: Graphing Tech Lab: Solving Trigonometric Inequalities 5-4: Sum and Difference Identities 5-5: Multiple-Angle and Product-to-Sum Identities	• How can representing the same mathematical relationship in different ways be helpful? Sample answer: Depending on the situation, it might be more helpful to use a visual representation such as a graph or diagram. In other situations it might be more helpful to use a numerical or algebraic representation such as a table of values or equation. • Why would it be helpful to replace an expression with an equivalent expression? Sample answer: It could simplify the problem, thus making the problem-solving process easier. • Why are trigonometric identities useful?	CC.2.2.HS.C.8 Choose trigonometric functions to model periodic phenomena and describe the properties of the graphs. CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios. G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction). G.2.1.1.1 Use the Pythagorean Theorem or trigonometric ratios to write and/or solve problems involving right triangles. G.2.1.1.2 Use trigonometric ratios to write and/or solve problems involving right	5-1 • Identify and use basic trigonometric identities to find trigonometric values • Use basic trigonometric identities to simplify and rewrite trigonometric expressions 5-2 • Verify trigonometric identities • Determine whether equations are identities 5-3 • Solve trigonometric equations using algebraic techniques • Solve trigonometric equations using basic identities Extend 5-3 • Use a graphing calculator to solve trigonometric inequalities 5-4 • Use sum and	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			Sample answer: Trigonometric identities provide a way to simplify complex trigonometric expressions by rewriting them in equivalent, but more convenient forms. • How do you decide what techniques to use when verifying a trigonometric identity? Sample answer: If possible, simplify the most complex side of the identity by substituting basic trigonometric identities. When dealing with a more complex identity, work each side separately to obtain a common expression.	triangles.	difference identities to evaluate trigonometric functions • Use sum and difference identities to solve trigonometric equations 5-5 • Use double-angle, power-reducing, half-angle, and product-to-sum identities to evaluate trigonometric expressions and solve trigonometric equations		
Weeks 11 & 12	• Mathematical statements can be justified through deductive and inductive reasoning and proof. • Some geometric relationships can be described and explored as functional relationships. • Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent	1. Definitions & Abbreviations for the 6 trig functions 2. Rationalizing Denominators 3. Algebraic signs of trig functions 4. Reciprocal Identities 5. Ratio Identities 6. Pythagorean Identities	• Find the six trigonometric functions of theta, if theta is an angle in standard position and the point (x,y) is a point on the terminal side of theta. • If r is the distance from the origin to the point (x.y), state the sic rations, or definitions, corresponding to the six trig functions. • Find the sine and cosine of 45 degrees. • Find the sine, cosine, and tangent of 270 degrees. • State the reciprocal	CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically. CC.2.3.HS.A.14 Apply geometric concepts to model and solve real world problems.	6-1 • Solve systems of linear equations using matrices and Gaussian elimination • Solve systems of linear equations using matrices and Gauss-Jordan elimination 6-2 • Multiply Matrices • Find determinants and inverses of 2x2 and 3x3 matrices Extend 6-2 • Use a graphing calculator to find areas of polygons using determinants 6-3 • Solve systems of	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

	forms.		identities for csc, sec, and cot. • State the equivalent forms of the reciprocal identities for sin, cos, and tan. • State the ratio identities for tan and cot. • State the three Pythagorean identities.	CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures. CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.	linear equations using inverse matrices • Solve systems of linear equations using Cramer's Rule • Extend 6-3 • Use a graphing calculator and matrices to encode and decode messages 6-4 • Write partial fraction decompositions of rational expressions with lnear factors in the denominator • Write partial fraction decompositions of rational expressions with prime quadratic factors in the denominator 6-5 • Use linear programming to solve applications • Recognize situations in which there are multiple points at which a function is optimized		
Weeks 18-20 Chapter 7	• Conics help us model motion, and parametric equations can help us model motion in space over time.	7-1: Parabolas 7-2: Ellipses and Circles 7-3: Hyperbolas 7-4: Rotations of Conic Sections Extend 7-4: Graphing Tech Lab: Systems of Nonlinear Equations and inequalities	• How does mathematics help us to describe the physical world? Sample answer: Mathematics enables us to model real-world situations, which allows us to analyze and understand these situations better, and thus make better decisions. • How are conics helpful? Sample	A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only). A1.1.2.1.3 Interpret solutions to	7-1 • Analyze and graph equations of parabolas • Write equations of parabolas 7-2 • Analyze and graph equations of ellipses and circles • Use equations to identify ellipses and circles 7-3 • Analyze and graph equations of	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

		7-5: Parametric Equations Extend 7-5: Graphing Tech Lab: Modeling with Parametric Equations	answer: Conics are helpful because they have multiple forms, and thus can be used to model various real-world situations such as planetary orbits and projectile motion. • How are hyperbolas similar to and different from the other conic sections? Sample answer: Similarities: The graphs are curves; equations contain one or two variables raised to second power. Differences: Hyperbolas have two branches; other conic sections are continuous. • How do parametric equations help you to see the whole picture? Sample answer: Parametric equations offer a way to describe both the horizontal and vertical position of an object as a function of time. This is helpful because it allows you to determine where the object is at any given time.	problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations). A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only). A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A1.2.2.1.1 Identify, describe and/or use constant rates of change. A1.2.2.1.3 Write or identify a linear equation when given the graph of the line 2 points on the line, or the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form).	hyperbolas • Use equations to identify types of conic sections 7-4 • Find rotation of axes to write equations of rotated conic sections • Graph rotated conic sections Extend 7-4 • Use a graphing calculator to approximate solutions to systems of nonlinear equations and inequalities 7-5 • Graph parametric equations • Solve problems related to the motion of projectiles Extend 7-5 • Use a graphing calculator to model functions parametrically		

				A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics). A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table			

				and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.6 Interpret functions in terms of the situation they model. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.			
Weeks 21-23 Chapter 8	• Vectors help us accurately model motion in the real world, accounting for both force and direction.	8-1: Introduction to Vectors 8-2: Vectors in the Coordinate Plane 8-3: Dot Products and Vector Projections 8-4: Vectors in Three-Dimensional Space Extend 8-4: Graphing Tech Lab: Vector Transformations with Matrices 8-5: Dot and Cross-Products of Vectors in Space	• How can you represent physical quantities that you cannot see? Sample answer: using numbers, variables, expressions, equations, functions, graphs • How can vectors be used to model and analyze real-world situations? Sample answer: Vectors can be used to model quantities that have both magnitude and direction, such as weight, force, and velocity. Vector operations can then be used to solve problems involving these quantities. • In what ways are position words such as north, south, up, and down useful when modeling with vectors? Sample answer: Position words clarify the	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form nothing larger than a binomial multiplied by a trinomial). A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations). A1.1.2.2.2	8-1 • Represent and operate with vectors geometrically • Solve vector problems and resolve vectors into their rectangular components 8--2 • Represent and operate with vectors in the coordinate plane • Write a vector as a linear combination of unit vectors 8-3 • Find the dot product of two vectors and use the dot product to find the angle between them • Find the projection of one vector onto another 8-4 • Plot points and vectors in the three-dimensional coordinate system	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			direction of the vector, which is necessary when using vectors to describe a quantity. For three-dimensional vectors, position words also offer a frame of reference so that you know which quantities to use during computation.	Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only). A 2.1.2.2.2 Simplify rational algebraic expressions. A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions.	• Express algebraically and operate with vectors in space Extend 8-4 • Use a graphing calculator to transform vectors using matrices 8-5 • Find dot products of and angles between vectors in space • Find cross products of vectors in space, and use cross products to find area and volume		

				CC.2.2.HS.C.6 Interpret functions in terms of the situation they model. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.			
Weeks 23-25 Chapter 9	• Polar form helps us locate points relative to an original position.	9-1: Polar Coordinates Explore 9-2: Graphing Tech Lab: Investigate Graphs of Polar Equations 9-2: Graphing of Polar Equations 9-3: Polar and Rectangular Forms of Equations 9-4: Polar Forms of Conic Sections 9-5: Complex Numbers and DeMoivre's Theorem	• Why is it helpful to have more than one coordinate system? Sample answer: Depending on the situation, one coordinate system might be more practical than another. • How does the polar coordinate system compare to the rectangular coordinate system? Sample answer: The polar coordinate system is also a two-dimensional system in which points are named by ordered pairs and can be used to graph functions. However, in the polar system coordinates are graphed with respect to one axis instead of two and are named using an angle and a distance. The polar system also differs in that it is based on circles instead of lines, which means	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form nothing larger than a binomial multiplied by a trinomial). A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations). A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear	9-1 • Graph points with polar coordinates • Graph simple polar equations Explore 9-2 • Use a graphing calculator to explore the shape and symmetry of graphs of polar equations 9-2 • Graph polar equations • Identify and graph classical curves 9-3 • Convert between polar and rectangular coordinates • Convert between polar and rectangular equations 9-4 • Identify polar equations of conics • Write and graph the polar equation of a conic given its eccentricity and the equation of its directory 9-5	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			that a point can be represented by infinitely many ordered pairs of polar coordinates instead of exactly one. • How are the polar and complex numbers useful in real-life situations? Sample answer: Polar numbers are useful in situations in which information is most conveniently expressed in terms of distance from the origin. Complex numbers can be used to represent relationships involving electricity.	equations only). A2.1.2.2.2 Simplify rational algebraic expressions. A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.6 Interpret functions in terms of the situation they model.	• Convert complex numbers from rectangular to polar form and vice versa • Find products, quotients, powers, and roots of complex numbers in polar form		

				CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.			
Weeks 26-28 Chapter 10	• Patterns can be modeled, and the models used to analyze and make predictions about the world around us.	10-1: Sequences, Series, and Sigma Notation 10-2: Arithmetic Sequences and Series 10-3: Geometric Sequences and Series Extend 10-3: Graphing Tech Lab: Continued Fractions 10-4: Mathematical Induction 10-5: The Binomial Theorem 10-6: Functions as Infinite Series Extend 10-6: Spreadsheet Lab: Detecting Patterns in Data	• Where are patterns found in the real world? Sample answer: in nature, architecture, music, science, art • How can recognizing patterns help you solve real-world problems? Sample answer: Recognizing a pattern can help you to predict future behavior. • What types of patterns can be modeled mathematically? Sample answer: numerical patterns involving real number operations such as addition and multiplication • How are patterns of change related to the behavior of functions? Sample answer: Some patterns can be represented numerically using sequences and then modeled using functions. The function used to model the sequence depends on the pattern of change. For example, a	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form nothing larger than a binomial multiplied by a trinomial). A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations). A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only). A2.1.2.2.2 Simplify rational	10-1 • Investigate several different types of sequences • Use sigma notation to represent and calculate sums of series 10-2 • Find nth terms and arithmetic means of arithmetic sequences • Find sums of n terms of arithmetic series 10-3 • Find nth terms and geometric means of geometric sequences • Find sums of n terms of geometric series and the sums of infinite geometric series Extend 10-3 • Use a graphing calculator to represent continued fractions 10-4 • Use mathematical induction to prove summation formulas and properties of divisibility involving a positive integer n • Use extended	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

			pattern that can be represented by an arithmetic sequence can be modeled using a linear function because the sequence and function exhibit the same behavior the terms in the sequence and the graph of the function are both changing at a constant rate.	algebraic expressions. A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.6 Interpret functions in terms of the situation they model. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in	mathematical induction 10-5 • Use Pascal's Triangle to write binomial expansions • Use the Binomial Theorem to write and find the coefficients of specified terms in binomial expansions 10-6 • Use a power series to represent a rational function • Use power series representations to approximate values of transcendental functions Extend 10-6 • Organize and display data using spreadsheets to detect patterns and departures from data		

				terms of its context. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.			
Weeks 29-32 Chapter 11	• Statistical data can be analyzed to make decisions, but should be evaluated to be sure the data isn't trying to persuade you.	11-1: Descriptive Statistics 11-2: Probability Distributions 11-3: The Normal Distribution Extend 11-3: Graphing Tech Lab: Transforming Skewed Data 11-4: The Central Limit Theorem 11-5: Confidence Intervals 11-6: Hypothesis Testing 11-7: Correlation and Linear Regression	• How can you effectively evaluate information? Sample answer: First, determine whether the information source is credible. Then critically analyze the information to determine whether it is useful for the given situation. • How can you use information to make decisions? Sample answer: You can look for trends, and then make a decision based on what has happened in the past and/or is reflected in the information. • Can statistics lie? Sample answer: Statistics can "lie" when they are manipulated and then used to influence the intended audiences' beliefs and behaviors. • How can a statistical test be used in a decision-making process? Sample answer: You can use a statistical test to help you to determine the strength of your decision.	A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. A1.2.1.1.2 Determine if a relation is a function given a set of points or a graph. A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table). A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function. A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation). A1.2.2.2.1 Draw, find and/or write an equation for a line of best fit for a scatter plot. A1.2.3.2.1 Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations. A1.2.3.2.2	11-1 Identify the shapes of distributions Use measures of position to compare to sets of data 11-2 Construct and use a probability distribution Construct and use a binomial distribution 11-3 Find area under normal distribution curved Find probabilities for normal distributions Extend 11-3 Use a graphing calculator to transform skewed data into data that resembles a normal distribution 11-4 Use the Central Limit Theorem Find normal approximations of binomial distributions 11-5 Use the normal distributions to find confidence intervals Use t-distributions to find confidence intervals 11-6 Write null and alternative hypotheses, and identify which represents the claims Perform hypothesis testing 11-7	Leveled Worksheets (Study Guide and Intervention, Skills Practice, Practice, Word Problems Practice, Enrichment.)	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

				Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations). A1.2.3.2.3 Make predictions using the equations or graphs of best-fit lines of scatter plots. A1.2.3.3.1 Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal or percent). A2.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. A2.2.1.1.2 Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic,	Measure the linear correlations Generate least-squares regression lines		

				or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). A2.2.3.1.1 Draw, identify, find and/or write an equation for a regression model (lines and curves of best fit) for a scatter plot. A2.2.3.1.2 Make predictions using the equations or graphs of regression models (lines and curves of best fit) of scatter plots. A2.2.3.2.1 Use combinations, permutations, and the fundamental counting principle to solve problems. A2.2.3.2.2 Use odds to find probability and/or use probability to find odds. A2.2.3.2.3 Use probability for independent, dependent or compound events to predict outcomes. CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables. CC.2.4.HS.B.2.a Interpret the means and/or medians of two sets of data CC.2.4.HS.B.4 Recognize and evaluate			

				random processes underlying statistical experiments. CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.			
Weeks 33-35 Chapter 12	• Derivatives and Integrals allow us to take a tiny piece of information about a real-world situation and use it to solve many different problems.	12-1: Estimating Limits Graphically 12-2: Evaluating Limits Algebraically 12-3: Tangent Lines and Velocity 12-4: Derivatives 12-5: Area Under a Curve and Integration 12-6: The Fundamental Theorem of Calculus	• How is mathematics used to describe change? Sample answer: Math is often used to describe a change in one quantity relative to another quantity. For example, a quadratic equation can be used to represent the change in the speed of a car relative to time. • How are derivatives used to describe change? Sample answer: Derivatives are used to describe a change in one quantity with respect to another quantity, regardless of whether the relationship is linear or nonlinear. For example, the derivative of a straight line is the slope of the line, which represents the average rate of change. The derivative of a curve at a given point is the slope of the line tangent to the curve at that point, which represents the	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form â€“ nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.2.1.1.1 Analyze a set of data for the existence of a	12-1 • Estimate limits of functions at fixed values • Estimate limits of functions at infinity 12-2 • Evaluate limits of polygonal and rational functions at selected points • Evaluate limits of polynomial and rational functions at infinity 12-3 • Find instantaneous rates of change by calculating slopes of tangent lines • Find average and instantaneous velocity 12-4 • Find instantaneous rates of change by calculating derivatives • Use the Product and Quotient rules to calculate derivatives 12-5 • Approximate the area under a curve using rectangles • Approximate the area under a curve using definite integrals and		

			instantaneous rate of change.	pattern and represent the pattern algebraically and/or graphically. A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table). A1.2.2.1.1 Identify, describe and/or use constant rates of change. A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems. A2.1.2.1.2 Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers - exponents should not exceed power of 10). A2.1.2.1.3 Simplify/evaluate expressions involving multiplying with exponents (e.g. x6 * x7 = x13), powers of powers (e.g., (x6)7=x42) and powers of products (2x2)3=8x6 (limit to rational exponents). A2.1.2.2.1 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is not equal to 0).	integration 12-6 • Find antiderivatives • Use the Fundamental Theorem of Calculus		

				A2.1.2.2.2 Simplify rational algebraic expressions. A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x2 + 21x) = 14). A2.1.3.2.1 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). A2.2.1.1.3 Determine the domain, range or inverse of a relation. A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics). A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or			

				logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., y = x2 and y = x2 + 3, or y = x2 and y = 3x2). CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context. CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations. CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities. CC.2.2.HS.C.6 Interpret functions in terms of the situation they model. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems. CC.2.2.HS.D.4 Understand the relationship between			

				zeros and factors of polynomials to make generalizations about functions and their graphs. CC.2.2.HS.D.6 Extend the knowledge of rational functions to rewrite in equivalent forms. G.2.2.2.1 Estimate area, perimeter or circumference of an irregular figure.			