New Paltz Central School District
Algebra 2 and Trigonometry

Algebra is more than a set of procedures for manipulating symbols. Algebra provides a way to explore, analyze, and represent mathematical concepts and ideas. It can describe relationships that are purely mathematical or ones that arise in real-world phenomena and are modeled by algebraic expressions. Learning algebra helps students make connections in varied mathematical representations, mathematics topics, and disciplines that rely on mathematical relationships. Algebra offers a way to generalize mathematical ideas and relationships, which apply to a wide variety of mathematical and nonmathematical settings. NCTM, Guiding Principles for Mathematics Curriculum and Assessment

Our goal is to use varying teaching/learning strategies in order to meet the needs of all the students and the demands of the content. These strategies include, but are not limited to, the following:

Give students a new type of problem and have students arrive at solutions individually or in groups. Then share with group to collect all the different ways to solve a problem.

Present a new problem and think, pair, share.

Give students a new type of problem together with a worked out solution and have students discover and explain, in writing and verbally, how and why the solution works.

Direct instruction – Typically direct instruction will follow some exploratory time for students to play around with a new type of problem/situation/scenario. Students' brainstorming will be the start of direct instruction, with notes and examples and information that help students make sense of the new problem and place it in the context of prior knowledge.

Have students analyze a new problem: what about it looks familiar, what about it looks new, how could they start the problem or, if they can't start, what might be involved while attacking the problem. Students share ideas in writing and verbally.

Have students use technology (graphing calculators, Geometer's Sketchpad, Graphmatica, etc) to explore functions and mathematical concepts.

Have students reflect on their learning in writing and verbally. A regular class wrap up will include asking students to write what they learned in the day's work, what questions they still have, what it reminds them of from past work, and other associations they have with the new material.

Expose students to complex problems that involve many concepts and lend themselves to a variety of solutions and strategies. These could be problems that take anywhere from 15 minutes to an hour to multiple days to solve.

Instructional goals

Nurture an appreciation for the distinct nature of mathematics as an abstract language system that is internally consistent and understood through rigorous analytical thinking skills.

Nurture an appreciation for how the analytical thinking and problem solving skills honed in mathematics is essential for students' current and future lives regardless of whether they choose a mathematical or scientific field.

Wherever possible, tie the mathematical content to other fields such as economics, literature, all the sciences, psychology, politics, etc., so that students can see the relevance and use of mathematics in other contexts.

Nurture numeracy and statistical savvy so that students may be critical consumers of statistical information in their current and future lives.

A constant goal is to achieve depth of understanding and connection, despite what we consider to be a much too full list of topics prescribed by the State of New York.

Nurture mathematical reasoning and analytical skills and the ways to express one's reasoning, both verbally and in writing. We want to encourage students to look for and recognize patterns, internal structure, regularities or irregularities both in "real-world" problems and in the symbolic language of mathematics. We want students to see when patterns are meaningful as opposed to when they are by chance or accidental. We want students to justify their solutions and to see why those solutions make sense.

Assessment

We plan to use both formal and informal assessments to ascertain understanding. Assessments will also be both formative and summative.

Projects – research and writing projects, statistics projects that involve gathering and analyzing data, solving and explaining solutions to complex, multi-faceted problems

Tests and quizzes

Group work – group work allows the teacher to circulate and listen in, thus giving the teacher an idea of student understanding and misconceptions.

Written descriptions of solutions to problems – students will be asked to describe their process for solving a particular problem in writing, which will give the teacher an insight into student understanding of the method being assessed.

Homework

We hope to train students to make homework a productive, reflective process. Homework is a time to practice problem solving skills and thinking processes. By providing solutions, we hope to encourage students to check their own work and work independently to find their own mistakes and identify any misunderstandings or gaps in knowledge.

New Paltz Central School District
Algebra 2 and Trigonometry
Topics

Unit 1: Relations and Functions
Unit 2: Polynomials and Quadratics
Unit 3: Complex Numbers
Unit 4: Rational Expressions and Equations
Unit 5: Exponents and Radicals
Unit 6: Exponential Functions and Equations
Unit 7: Logarithms
Unit 8: Sequence and Series
Unit 9: Statistics
Unit 10: Probability
Unit 11: Trigonometry – Six Trig Functions
Unit 12: Trigonometry Equations, Identities, and Radians
Unit 13: Trigonometry Graphs
Unit 14: Trigonometry of Non-Right Triangles

Sample problems can be found for each performance indicator in the NYSED Algebra 2 and Trigonometry Curriculum

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 1: Relations and Functions

Essential Questions:

1. **What is a relation and what is a function?**
2. **How can functions be represented numerically, graphically, algebraically, and verbally?**
3. **How can we use different types of functions to model real-world situations?**
4. **What effect do transformations have on functions?**

Time	Perform Ind	Content	Lessons	Vocabulary
Sept. (3 weeks)	A2.A.37	Define a relation and function	lesson 1 • introduce and discuss types of functions, their graphs, equations, tables, applications that call for different functions, etc: linear, absolute value, quadratic, power, exponential, logarithmic, trigonometric, polynomial • define relation and function • when is a relation a function • identify relations and functions using graphs, tables, words, mappings, algebraic expressions lesson 2 • function notation (f(x) and set builder notation) • domain and range (using graphs, equations, tables, mappings, words) • onto • evaluate functions lesson 3 • compositions • inverses • proving inverses using composition • when is an inverse also a function: one-to-one lesson 4 • linear functions – direct variation, applications, graphs, given f(x) find x. • solve absolute value equations and inequalities	relation function domain range composition inverse onto one to one linear absolute value quadratic polynomial power exponential logarithmic trigonometry transformation mapping direct variation
	A2.A.38	Determine when a relation is a function		
	A2.A.52	Identify relations and functions, using graphs		
	A2.A.51	Determine the domain and range of a function from its graph		
	A2.A.39	Determine the domain and range of a function from its equation		
	A2.A.40	Write functions in functional notation		
	A2.A.41	Use functional notation to evaluate functions for given values in the domain		
	A2.A.42	Find the composition of functions		
	A2.A.43	Determine if a function is one-to-one, onto, or both		
	A2.A.44	Define the inverse of a function		
	A2.A.45	Determine the inverse of a function and use composition to justify the result		
	A2.A.46	Perform transformations with functions and relations: $f(x+a)$, $f(x)+a$, $f(-x)$, $-f(x)$, $af(x)$		

	A2.A-47	Determine the center-radius form for the equation of a circle in standard form	lesson 5 • transformations of functions and relations $f(x+a)$, $f(x)+a$, $f(-x)$, $-f(x)$, $af(x)$ lesson 6 • equation of a circle: use knowledge of transformations to justify equation of a circle • transformations with circles	
	A2.A.48	Write the equation of a circle, given its center and a point on the circle		
	A2.A.49	Write the equation of a circle from its graph		
	A2.A.1	Solve absolute value equations and inequalities involving expressions in one variable		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 2: Polynomials and Quadratics

Essential Questions:

1. **What are polynomial equations and quadratic equations and how can we find roots?**
2. **How can real-world situations be modeled by quadratics and higher order polynomials?**
3. **What does it mean to solve a system of equations?**

Time	Perform Ind	Content	Lessons	Vocabulary
Sept. – Oct. (4 weeks)	A2.N.3	Perform arithmetic operations with polynomial expressions containing rational coefficients	lesson 1 • perform four basic operations on polynomial expressions • factor polynomials lesson 2 • solve quadratic equations by factoring and graphing • completing the square and its applications (prove quadratic formula, rewrite circle equations, solve quadratics) • quadratic formula lesson 3 • quadratic applications and graphing calculator usage lesson 4 • write the equation of a quadratic given roots: sum and product of roots lesson 5 • factor and solve polynomials of higher degree using factoring and quadratic formula • approximate solutions to polynomials graphically lesson 6 • quadratic inequalities with applications • absolute value inequalities with applications lesson 7 • systems of equations: linear-quadratic (extraneous solutions)	monomial polynomial roots/zeros factor quadratic radicals inequalities systems rational irrational extraneous
	A2.A.7	Factor polynomial expressions completely, using any combination of the following techniques: common factor extraction, difference of two perfect squares, quadratic trinomials		
	A2.A.25	Solve quadratic equations, using the quadratic formula		
	A2.A.24	Know and apply the technique of completing the square		
	A2.A.20	Determine the sum and product of the roots of a quadratic equation by examining its coefficients		
	A2.A.21	Determine the quadratic equation, given the sum and product of its roots		
	A2.A.4	Solve quadratic inequalities in one and two variables, algebraically and graphically		
	A2.A.26	Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula		
	A2.A.50	Approximate the solution to polynomial equations of higher degree by inspecting the graph		
	A2.A.3	Solve systems of equations involving one linear equation and one quadratic equation algebraically *Note: This includes rational equations that result in linear equations with extraneous roots.*		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 3: Complex Numbers

Essential Questions:

1. **What are imaginary and complex numbers?**
2. **How can you analyze a quadratic to determine the nature of the roots?**

Time	Perform Ind	Content	Lessons	Vocabulary
Oct. – Nov. (2 weeks)	A2.A.2	Use the discriminate to determine the nature of the roots of a quadratic equation	lesson 1 • determine nature of roots of quadratic using graphs and discriminant • determine missing coefficient based on nature of roots or a given root. lesson 2 • what is i • simplify radicals in terms of i • solve quadratics with imaginary roots lesson 3 • powers of i (cycle of 4) • basic operations (+, -, x) with complex numbers • conjugate • dividing complex numbers (rationalize denominator) lesson 4 • find quadratic equation given complex roots	discriminant complex numbers nature of the roots conjugate rationalize radical imaginary numbers
	A2.N.6	Write square roots of negative numbers in terms of *i*		
	A2.N.7	Simplify powers of *i*		
	A2.N.9	Perform arithmetic operations on complex numbers and write the answer in the form $a+bi$ *Note: This includes simplifying expressions with complex denominators.*		
	A2.N.8	Determine the conjugate of a complex number		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 4: Rational Expressions and Equations

Essential Questions:

1. **What are rational expressions and equations and what are the different ways to solve rational equations?**
2. **What is inverse variation and what real-world situations can be modeled by inverse variation?**

Time	Perform Ind	Content	Lessons	Vocabulary
Nov. (1-2 weeks)	A2.A.16	Perform arithmetic operations with rational expressions and rename to lowest terms	lesson 1/2 • simplify rational expressions • four basic operations with rational expressions • simplify complex fractional expressions • solve rational equations and inequalities lesson 3 • inverse variation: compare to direct variation, applications, graphs, solving for unknown value	rational expressions rational equations complex fractions inverse variation
	A2.A.17	Simplify complex fractional expressions		
	A2.A.23	Solve rational equations and inequalities		
	A2.A.5	Use direct and inverse variation to solve for unknown values		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 5: Exponents and Radicals

Essential Questions:

1. **How do different numerical exponents affect a base?**
2. **How can expressions be re-written using exponents or radicals?**
3. **What situations lend themselves to being expressed by equations with exponents or radical equations?**

Time	Perform Ind	Content	Lessons	Vocabulary
Nov. – Dec. (2 weeks)	A2.A.9	Rewrite algebraic expressions that contain negative exponents using only positive exponents	lesson 1 • work with zero, negative, fractional exponents: use rule of exponents, re-write expressions with positive exponents, evaluate numerical expressions without a calculator, rewrite expressions with fractional exponents as radicals and vice versa lesson 2 • solve equations with integral exponents, fractional exponents and/or radicals lesson 3 • simplify radical expressions (nth root) • basic operations (+, -, x) with radicals (simplify nth roots with variables as radicands) • division of radicals (rationalize denominator with conjugates)	base exponent radical radicand nth root conjugate rationalize denominator irrational number rational expression
	A2.A.8	Apply the rules of exponents to simplify expressions involving negative and/or fractional exponents		
	A2.N.1	Evaluate numerical expressions with negative and/or fractional exponents, without the aid of a calculator (when the answers are rational numbers)		
	A2.A.10	Rewrite algebraic expressions with fractional exponents as radical expressions		
	A2.A.11	Rewrite algebraic expressions in radical form as expressions with fractional exponents		
	A2.A.22	Solve radical equations		
	A2.N.5	Rationalize a denominator containing a radical expression		
	A2.A.15	Rationalize denominators involving algebraic radical expressions		
	A2.A.13	Simplify radical expressions		
	A2.N.4	Perform arithmetic operations on irrational expressions		
	A2.A.14	Perform addition, subtraction, multiplication, and division of radical expressions		
	A2.N.2	Perform arithmetic operations (addition, subtraction, multiplication, division) with expressions containing irrational numbers in radical form		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 6: Exponential Functions and Equations

Essential Questions:

1. **What is an exponential expression, equation, or function?**
2. **What situations can be modeled by exponential functions?**
3. **What is e and how is it useful in modeling natural growth or decay?**

Time	Perform Ind	Content	Lessons	Vocabulary
Dec. (2 weeks)	A2.A.53	Graph exponential functions of the form $y = b^x$ for positive values of *b*, including $b = e$	lesson 1 • analyze graphs of exponential functions and compare to other functions • analyze exponential growth and decay graphs and the situations they describe lesson 2 • solve exponential equations using the method of finding common bases lesson 3 • solve application problems both algebraically and graphically	exponential e growth decay compound interest percent increase percent decrease asymptote
	A2.A.27	Solve exponential equations with and without common bases		
	A2.A.6	Solve an application which results in an exponential function		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 7: Logarithms

Essential Questions:

1. **What is a logarithm?**
2. **How can logarithms be used to solve exponential equations?**
3. **What real world situations can be modeled by logarithmic functions?**

Time	Perform Ind	Content	Lessons	Vocabulary
Jan. (2 weeks)	A2.A.18	Evaluate logarithmic expressions in any base	lesson 1 • graph the inverse of an exponential function and discuss the resulting function and its equation • what is a log • $\log_B N = E,\ B^E = N$ • solve simple log equations by rewriting as an exponential equation • common logs, natural logs lesson 2/3 • explore and apply the properties of logs to rewrite expressions • evaluate expressions with base e lesson 4 • solve log equations using the properties of logs • solve exponential equations using logs	logarithm base exponent inverse function common log natural log
	A2.A.54	Graph logarithmic functions, using the inverse of the related exponential function		
	A2.A.19	Apply the properties of logarithms to rewrite logarithmic expressions in equivalent forms		
	A2.A.27	Solve exponential equations with and without common bases		
	A2.A.28	Solve a logarithmic equation by rewriting as an exponential equation		
	A2.A.12	Evaluate exponential expressions, including those with base e		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 8: Sequence and Series

Essential Questions:

1. **What is the difference between a series and a sequence?**
2. **What is the difference between an arithmetic and geometric series/sequence?**
3. **How can we derive the formula for any series?**
4. **What real-world situations can be modeled by a sequence or series?**

Time	Perform Ind	Content	Lessons	Vocabulary
Feb. (2 weeks)	A2.N.10	Know and apply sigma notation	lesson 1 • what are sequences and series • sigma notation (forwards and backwards) • identify sequences as being arithmetic or geometric • find formula for nth term of sequence lesson 2 • find common difference and common ratio • determine a specified term of a sequence lesson 3 • recursive definition • find sum of series	series sequence sigma arithmetic geometric recursion
	A2.A.34	Represent the sum of a series, using sigma notation		
	A2.A.29	Identify an arithmetic or geometric sequence and find the formula for its *n*th term		
	A2.A.30	Determine the common difference in an arithmetic sequence		
	A2.A.31	Determine the common ratio in a geometric sequence		
	A2.A.33	Specify terms of a sequence, given its recursive definition		
	A2.A.32	Determine a specified term of an arithmetic or geometric sequence		
	A2.A.35	Determine the sum of the first *n* terms of an arithmetic or geometric series		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 9: Statistics

Essential Questions:

1. **What are the different statistical tools that can be used to collect and analyze data?**
2. **What are some valid ways to use statistics and what are some non-valid ways to use statistics?**
3. **How is the normal distribution curve used as a predictor of outcomes?**

Time	Perform Ind	Content	Lessons	Vocabulary
Feb. – March (2 weeks)	A2.S.1	Understand the differences among various kinds of studies (e.g., survey, observation, controlled experiment)	lesson 1 • discuss and experience data collection methods (one-variable stats) • calculate measures of central tendency with data sets including frequency distributions • discuss and calculate measures of dispersion (range, variance, standard deviation for populations and samples). lesson 2 • discuss normal distribution and determine whether data is normally distributed • analyze normal distributions using the bell curve. lesson 3 • create and analyze scatterplots for two-variable statistics datasets • determine the regressions for all types of two-variable datasets • for linear regressions, determine strength of the relationship using the correlation coefficient • use regressions to interpolate and extrapolate	correlation correlations coefficient normal distribution standard deviation variance regression central tendency mean, median, mode scatterplot interpolate extrapolate measures of dispersion frequency outlier
	A2.S.2	Determine factors which may affect the outcome of a survey		
	A2.S.6	Determine from a scatter plot whether a linear, logarithmic, exponential, or power regression model is most appropriate		
	A2.S.8	Interpret within the linear regression model the value of the correlation coefficient as a measure of the strength of the relationship		
	A2.S.7	Determine the function for the regression model, using appropriate technology, and use the regression function to interpolate and extrapolate from the data		
	A2.S.3	Calculate measures of central tendency with group frequency distributions		
	A2.S.4	Calculate measures of dispersion (range, quartiles, interquartile range, standard deviation, variance) for both samples and populations		
	A2.S.5	Know and apply the characteristics of the normal distribution		
	A2.S.16	Use the normal distribution as an approximation for binomial probabilities		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 10: Probability

Essential Questions:

1. **What is the difference between empirical probability and theoretical probability?**
2. **What is binomial probability and for what situations is the binomial probability formula useful?**
3. **How can the number of elements in a sample space be generated using permutations, combinations, and the Fundamental Principle of Counting?**

Time	Perform Ind	Content	Lessons	Vocabulary
March (2 weeks)	A2.S.14	Calculate empirical probabilities	lesson 1 • determine the number of elements in a sample space using combinations, permutations, and the Fundamental Principle of Counting. • compare and contrast empirical probability and theoretical probability • calculate single-event empirical probabilities and theoretical probabilities lesson 2 • discuss binomial probability and generate/derive the binomial probability formula • solve *exactly*, *at least,* and *at most* problems using binomial probability formula lesson 3 • investigate expanding binomials and generate/derive the binomial theorem using Pascal's Triangle and combinations • discuss relationship between binomial theorem and binomial probability	empirical probability theoretical probability combinations permutations binomial probability binomial expansion Pascal's Triangle sample space at least, at most
	A2.S.13	Calculate theoretical probabilities, including geometric applications		
	A2.S.10	Calculate the number of possible permutations $({}_nP_r)$ of *n* items taken *r* at a time		
	A2.S.11	Calculate the number of possible combinations $({}_nC_r)$ of *n* items taken *r* at a time		
	A2.S.9	Differentiate between situations requiring permutations and those requiring combinations		
	A2.S.12	Use permutations, combinations, and the Fundamental Principle of Counting to determine the number of elements in a sample space and a specific subset (event)		
	A2.S.15	Know and apply the binomial probability formula to events involving the terms *exactly*, *at least*, and *at most*		
	A2.A.36	Apply the binomial theorem to expand a binomial and determine a specific term of a binomial expansion		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 11: Trigonometry – Six Trig Functions

Essential Questions:

1. **What are the historical and current uses of trigonometry?**
2. **How are angles and trig ratios represented in the x-y coordinate plane?**
3. **How can we use our knowledge of special triangles to find exact values of trig functions?**

Time	Perform Ind	Content	Lessons	Vocabulary
March-April (2 weeks)	A2.A.66	Determine the trigonometric functions of any angle, using technology	lesson 1 • angles as rotations, terminal side, coterminal angles • standard position and reference triangles • revisit SOHCAHTOA in the context of the first quadrant • find value of cosine, sine, tangent given a point on the terminal side in any quadrants lesson 2 • find exact values of sine, cosine, tangent using special triangles or unit circle lesson 3 • introduce reciprocal trig functions • find exact values of six trig functions • explore the co-function relationships	cosine sine tangent cosecant secant cotangent standard position terminal side coterminal angle reference angle reference triangle unit circle complementary co-function reciprocal function
	A2.A.60	Sketch the unit circle and represent angles in standard position		
	A2.A.62	Find the value of trigonometric functions, if given a point on the terminal side of angle θ		
	A2.A.57	Sketch and use the reference angle for angles in standard position		
	A2.A.56	Know the exact and approximate values of the sine, cosine, and tangent of 0º, 30º, 45º, 60º, 90º, 180º, and 270º angles		
	A2.A.55	Express and apply the six trigonometric functions as ratios of the sides of a right triangle		
	A2.A.58	Know and apply the co-function and reciprocal relationships between trigonometric ratios		
	A2.A.59	Use the reciprocal and co-function relationships to find the value of the secant, cosecant, and cotangent of 0º, 30º, 45º, 60º, 90º, 180º, and 270º angles		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 12: Trigonometry Equations, Identities, and Radians

Essential Questions:

1. **What are radians and why are they used in mathematics and science?**
2. **Which situations call for trigonometric equations and how are these equations solved?**
3. **How are the trigonometric identities useful?**

Time	Perform Ind	Content	Lessons	Vocabulary
April (3 weeks)	A2.A.64	Use inverse functions to find the measure of an angle, given its sine, cosine, or tangent	lesson 1 • revisit when and how to use inverse trig functions • define what a trig equation is and explore how to solve linear trig equations lesson 2 • solve quadratic trig equations, with the same trig function • introduce and prove Pythagorean identities • solve quadratic trig equations algebraically and graphically using Pythagorean identities and double angle identities lesson 3 • application problems with mixed trig equations • become familiar with trig identities: sum and difference of angles, half angles, double angles (from reference sheet) lesson 4 • introduce radians • convert between radians and degrees • explore the relationship between the length of an arc of a circle, its radius, and its central angle • application problems with $S = \theta r$ lesson 5 • solve mixed trig equations and applications using radians	radian identities inverse arc length sector double angle half angle sum of angles difference of angles
	A2.A.68	Solve trigonometric equations for all values of the variable from 0º to 360º		
	A2.A.67	Justify the Pythagorean identities		
	A2.M.1	Define radian measure		
	A2.M.2	Convert between radian and degree measures		
	A2.A.61	Determine the length of an arc of a circle, given its radius and the measure of its central angle		
	A2.A.76	Apply the angle sum and difference formulas for trigonometric functions		
	A2.A.77	Apply the double-angle and half-angle formulas for trigonometric functions		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 13: Trigonometry Graphs

Essential Questions for this unit:

1. **What is unique about sinusoidal and trigonometric curves?**
2. **How does changing the equation of a trig function affect the graph of the function?**
3. **What situations can be modeled using trigonometric graphs and functions?**

Time	Perform Ind	Content	Lessons	Vocabulary
May (2 weeks)	A2.A.70	Sketch and recognize one cycle of a function of the form $y = A\sin Bx$ or $y = A\cos Bx$	lesson 1 • explore sine and cosine curves and discover how changes in the equation affect the graph (amplitude, frequency, vertical shift, phase shift) • unwrap the unit circle to create a sine and cosine curve • find equation given graph, sketch graph given equation lesson 2 • explore tangent curve by unwrapping the unit circle • explore reciprocal trig graphs • find equation given graph, sketch graph given equation lesson 3 • application problems, solved graphically and algebraically lesson 4 • graphs of inverse trig functions • explore how to restrict domains to make an inverse relation a function	amplitude frequency phase shift period sinusoidal restricted domain
	A2.A.69	Determine amplitude, period, frequency, and phase shift, given the graph or equation of a periodic function		
	A2.A.72	Write the trigonometric function that is represented by a given periodic graph		
	A2.A.65	Sketch the graph of the inverses of the sine, cosine, and tangent functions		
	A2.A.63	Restrict the domain of the sine, cosine, and tangent functions to ensure the existence of an inverse function		
	A2.A.71	Sketch and recognize the graphs of the functions $y = \sec(x)$, $y = \csc(x)$, $y = \tan(x)$, and $y = \cot(x)$		

New Paltz Central School District
Algebra 2 and Trigonometry

Unit 14: Trigonometry of Non-Right Triangles

Essential Questions:

1. **How can you use trigonometry in non-right triangles?**
2. **What situations can be described by non-right triangles?**
3. **What is ambiguous about the "ambiguous case"?**

Time	Perform Ind	Content	Lessons	Vocabulary
May – June (2 weeks)	A2.A.73	Solve for an unknown side or angle, using the Law of Sines or the Law of Cosines	lesson 1 • discuss the applications of trig in non-right triangles • use law of sines to find missing sides and angles • use law of cosines to find missing sides and angles lesson 2 • applications of law of sines and law of cosines lesson 3 • explore and prove the area of a triangle formula • find area of triangles and parallelograms • applications lesson 4 • the ambiguous case	law of sines law of cosines ambiguous case area
	A2.A.74	Determine the area of a triangle or a parallelogram, given the measure of two sides and the included angle		
	A2.A.75	Determine the solution(s) from the SSA situation (ambiguous case)		