

Nevada Mathematics Standards

ECSD Trigonometry

Scope and Sequence

And

Learning Targets

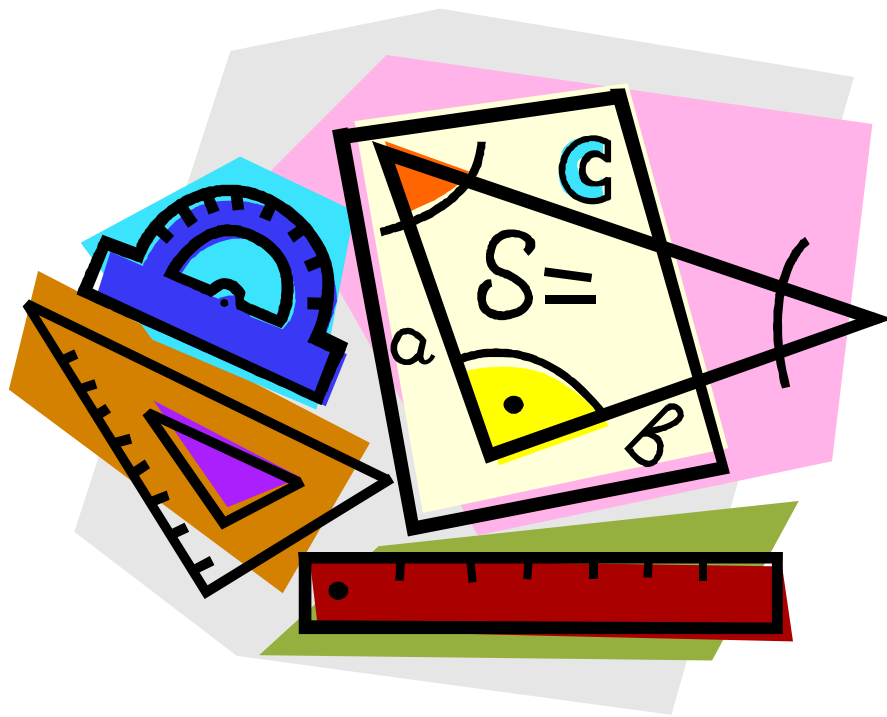
Teachers should expect to complete the indicated chapters and sections in 3 quarters or less, leaving one quarter for the statistics portion of the year.

Scope and Sequences (Pages 2 – 10)

Learning Targets (Pages 11 – 25)

Trigonometry

Scope and Sequence



Textbook Reference Houghton Mifflin Company Trigonometry Copyright © 2007	Nevada State and ECSD Learning Objectives for Trigonometry	ECSD Learning Targets
Chapter P – Prerequisites		
P.7 A Library of Parent Functions - Identify and graph linear and squaring functions. - Identify and graph cubic, square root, and reciprocal functions. - Identify and graph step and other piecewise-defined functions. - Recognize graphs of parent functions.	2.12.4 Determine the domain and range of functions, including linear, quadratic, and absolute value, algebraically and graphically. Solve absolute value equations and inequalities both algebraically and graphically. 1.ET.1 Simplify radicals. Rationalize denominators. Perform basic operations on irrational numbers.	A1: c A2: b A1: a – d A2: a, b, c
P.8 Transformations of Functions - Use vertical and horizontal shifts to sketch graphs of functions. - Use reflections to sketch graphs of functions. - Use nonrigid transformations to sketch graphs of functions.	2.ET.1 Analyze graphs of functions. Identify transformations of functions. Find inverses of functions.	A: f, h A2: e A3: c
P.9 Combinations of Functions: Composite Functions - Add, subtract, multiply, and divide functions. - Find the composition of one function with another function. - Use combinations and compositions of functions to model and solve real-life problems.	2.12.4 Determine the domain and range of functions, including linear, quadratic, and absolute value, algebraically and graphically. Solve absolute value equations and inequalities both algebraically and graphically.	A1: b, c A2: e, f A3: a
P.10 Inverse Functions - Find inverse functions informally and verify that two functions are inverse functions of each other. - Use graphs of functions to determine whether functions have inverse functions. - Use the Horizontal Line Test to determine if functions are one-to-one. - Find inverse functions algebraically.	2.ET.1 Analyze graphs of functions. Identify transformations of functions. Find inverses of functions.	A1: g, h A2: f A3: b

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Chapter 1 - Trigonometry		
1.1 Radian and Degree Measure - Describe angle. - Use radian measure. - Use degree measure. - Use angles to model and solve real-life problems. 1.2 Trigonometric Functions: The Unit Circle - Identify a unit circle and describe its relationship to real numbers. - Evaluate trigonometric functions using the unit circle. - Use domain and period to evaluate sine and cosine functions. - Use a calculator to evaluate trigonometric functions. 1.3 Right Triangle Trigonometry - Evaluate trigonometric functions of acute angles. - Use the fundamental trigonometric identities. - Use a calculator to evaluate trigonometric functions. - Use trigonometric functions to model and solve real-life problems. 1.4 Trigonometric Functions of Any Angle - Evaluate trigonometric functions of any angle. - Use reference angles to evaluate trigonometric functions. - Evaluate trigonometric functions of real numbers. 1.5 Graphs of Sine and Cosine Functions - Use amplitude and period to help sketch the graphs of sine and cosine functions. - Sketch translations of the graphs of sine and cosine functions. - Use sine and cosine functions to model real-life data. 1.6 Graphs of Other Trigonometric Functions - Sketch the graphs of tangent and cotangent functions. - Sketch the graphs of secant and cosecant functions. - Sketch the graphs of damped trigonometric functions. 1.7 Inverse Trigonometric Functions - Evaluate and graph the inverse sine function. - Evaluate and graph the other inverse trigonometric functions. - Evaluate composition of trigonometric functions. 1.8 Applications and Models - Solve real-life problems involving right triangles. - Solve real-life problems involving directional bearings. - Solve real-life problems involving harmonic motion.	3.ET.1 Convert between radian and degree measures of angles. Determine linear and angular speed of a particle. 3.ET.2 Identify a unit circle and its relationship to real numbers. Evaluate trigonometric functions of any angle using a unit circle. Define and evaluate inverse trigonometric functions. Evaluate composite trigonometric functions. 2.ET.3 Graph the six trigonometric functions. Perform transformations on the graphs of trigonometric functions. 4.12.2 Apply properties of similarity and right triangle trigonometry to find missing angles and sides. 4.12.7 Apply the Pythagorean Theorem and its converse in mathematical and practical situations.	A1: $a - f$ A2: $a - i$ A3: a, b A1: $a - g$ A2: $a - g$ A3: a, b A1: $a - h$ A2: $a - e$ A3: $a - d$ A1: $a - h$ A2: $a - d$ A3: $a - d$ A1: $a - f$ A2: $a - d$ A3: $a - d$

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Chapter 2 – Analytic Trigonometry		
2.1 Using Fundamental Identities - Recognize and write the fundamental trigonometric identities. - Use the fundamental trigonometric identities to evaluate trigonometric functions, simplify trigonometric expressions, and rewrite trigonometric expressions. 2.2 Verifying Trigonometric Identities - Verify trigonometric identities. 2.3 Solving Trigonometric Equations - Use standard algebraic techniques to solve trigonometric equations. - Solve trigonometric equations of quadratic type. - Solve trigonometric equations involving multiple angles. - Use inverse trigonometric functions to solve trigonometric equations. 2.4 Sum and Difference Formulas - Use sum and difference formulas to evaluate trigonometric functions, verify identities, and solve trigonometric equations.	4.12.9 Formulate, evaluate, and justify arguments using inductive and deductive reasoning in mathematical and practical situations. 2.12.2 Isolate any variable in given equation, inequalities, proportions, and formulas to use in mathematical and practical situations.	A1: a – e A2: a, b A3: a, b A1: a, b A2: b – e A3: b
2.5 Multiple-Angle and Product-to-Sum Formulas - Use multiple-angle formulas to rewrite and evaluate trigonometric functions. - Use power-reducing formulas to rewrite and evaluate trigonometric functions. - Use half-angle formulas to rewrite and evaluate trigonometric functions. - Use product-to-sum and sum-to-product formulas to rewrite and evaluate trigonometric functions. - Use trigonometric formulas to rewrite real-life models.	<i>Teachers might include double angle formulas for sine and cosine when teaching Section 2.3 or Section 2.4 due to their importance in Calculus. The other formulas in this section can be omitted due to time constraints.</i>	

UNIT 2 – Algebra and Rational Numbers

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Chapter 3 – Additional Topics in Trigonometry		
3.1 Law of Sines • Use the Law of Sines to solve oblique triangles (AAS, ASA, or SSA). • Find areas of oblique triangles. • Use the Law of Sines to model and solve real-life problems. 3.2 Law of Cosines • Use the Law of Cosines to solve oblique triangles. • Use the Law of Cosines to model and solve real-life problems. • Use Heron's Area Formula to find areas of triangles.	3.ET.3 Know and use the Laws of Sines and Cosines. Find the areas of oblique triangles.	A1: $a - e$ A2: $a - d$ A3: $a - c$
3.3 Vectors in the Plane • Represent vectors as direct line segments. • Write the component forms of vectors. • Perform basic vector operations and represent vectors graphically. • Write vectors as linear combinations of unit vectors. • Find the direction angles of vectors. • Use vectors to model and solve real-life problems. 3.4 Vectors and Dot Products • Find the dot product of two vectors and use the properties of the dot product. • Find the angle between two vectors and determine whether two vectors are orthogonal. • Write vectors as sums of two vector components. • Use vectors to find the work done by a force.	Due to time constraints, these sections on vectors can be omitted. They are covered in higher level math and science classes.	

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Chapter 4 – Complex Numbers		
4.1 Complex Numbers • Use imaginary unit i to write complex numbers. • Add, subtract, and multiply complex numbers. • Use complex conjugates to write the quotient of two complex numbers in standard form. • Find complex solutions of quadratic equations. 4.2 Complex Solutions of Equations • Determine the numbers of solutions of polynomial equations. • Find solutions of polynomial equations. • Find zeros of polynomial functions and find polynomial functions given the zeros of the functions.	1.ET.2 Use the imaginary unit i to write complex numbers. Perform basic operations on complex numbers. (Optional) Write complex numbers in trigonometric form.	A1: $a - h$ A2: $a - f$ A3: $a - c$
4.3 Trigonometric Form of a Complex Number • Plot complex numbers in the complex plane and find absolute values of complex numbers. • Write the trigonometric forms of complex numbers. • Multiply and divide complex numbers written in trigonometric form. 4.4 DeMoivre's Theorem • Use DeMoivre's Theorem to find powers of complex numbers. • Find nth roots of complex numbers.	<i>Due to time constraints, these sections can be considered optional. They are covered in higher level math classes.</i>	

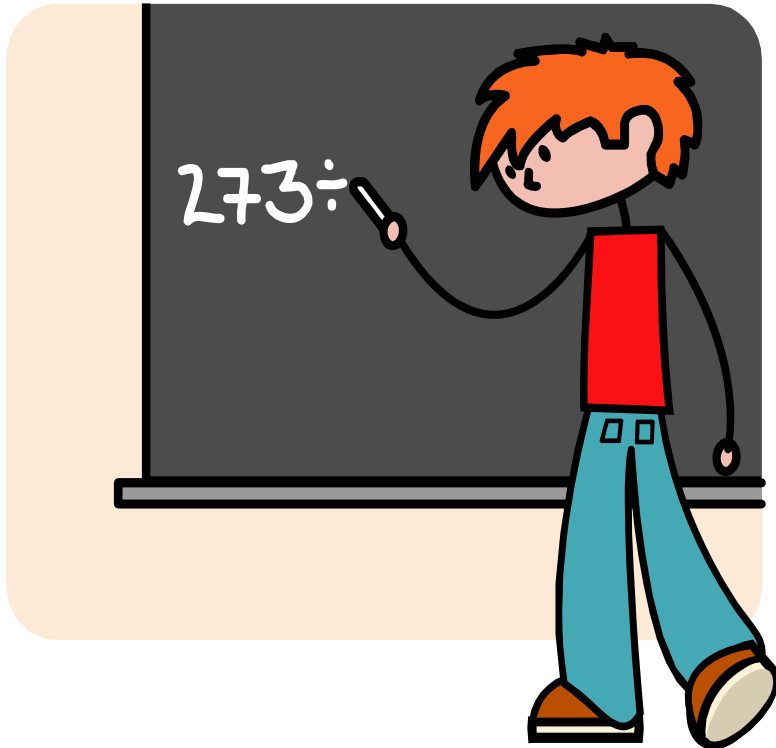
UNIT 3 – Linear Equations, Inequalities, and Functions

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Chapter 5 – Exponential and Logarithmic Functions		
5.1 Exponential Functions and Their Graphs • Recognize and evaluate exponential functions with base a. • Graph exponential functions and use the One-to-One Property. • Recognize, evaluate, and graph exponential functions with base e. • Use exponential functions to model and solve real-life problems. 5.2 Logarithmic Functions and Their Graphs • Recognize and evaluate logarithmic functions with base a. • Graph logarithmic functions. • Recognize, evaluate, and graph natural logarithmic functions. • Use logarithmic functions to model and solve real-life problems. 5.3 Properties of Logarithms • Use the change-of-base formula to rewrite and evaluate logarithmic expressions. • Use properties of logarithms to evaluate or rewrite logarithmic expressions. • Use properties of logarithms to expand or condense logarithmic expressions. • Use logarithmic functions to model and solve real-life problems. 5.4 Exponential and Logarithmic Equations • Solve simple exponential and logarithmic equations. • Solve more complicate exponential equations. • Solve more complicated logarithmic equations. • Use exponential and logarithmic equations model and solve real-life problems. 5.5 Exponential and Logarithmic Models • Recognize the five most common types of models involving exponential and logarithmic functions. • Use exponential growth and decay functions to model and solve real-life problems. • Use Gaussian functions to model and solve real-life problems. • Use logistic growth functions to model and solve real-life problems. • Use logarithmic functions to model and solve real-life problems.	<i>Technology should be considered a must when teaching these sections, especially Section 5.5.</i> 2.ET.2 Write exponential expressions to model growth and decay situations. Calculate compound interest. Simply and evaluate expressions involving logarithms. Solve exponential and logarithmic equations.	A1: a, b, c A2: $a - d$ A3: $a - e$

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Chapter 6 – Topics in Analytic Geometry		
6.1 Lines • Find the inclination of a line. • Find the angle between two lines. • Find the distance between a point and a line. 6.2 Introduction to Conics: Parabolas • Recognize a conic as the intersection of a plane and a double-napped cone. • Write equations of parabolas in standard form and graph parabolas. • Use the reflective property of parabolas to solve real-life problems. 6.3 Ellipses • Write equations of ellipses in standard form and graph ellipses. • Use properties of ellipses to model and solve real-life problems. • Find the eccentricities of ellipses. 6.4 Hyperbolas • Write equations of hyperbolas in standard form. • Find asymptotes of and graph hyperbolas. • Use properties of hyperbolas to solve real-life problems. • Classify conics from their general equations. 6.5 Rotation of Conics • Rotate the coordinate axes to eliminate the xy-term in equations of conics. • Use the discriminant to classify conics. 6.6 Parametric Equations • Evaluate sets of parametric equations for given values of the parameter. • Sketch curves that are represented by sets of parametric equations and rewrite the equations as single rectangular equations. • Find sets of parametric equations for graphs. 6.7 Polar Coordinates • Plot points on the polar coordinate system. • Convert points from rectangular to polar form and vice versa. • Convert equations from rectangular to polar form and vice versa. 6.8 Graphs of Polar Equations • Graph polar equations by point plotting. • Use symmetry, zeros, and maximum r-values to sketch graphs of polar equations. • Recognize special polar graphs. 6.9 Polar Equations of Conics • Define conics in terms of eccentricity and write and graph equations of conics in polar form. • Use equations of conics in polar form to model real-life problems.	<i>Due to time constraints, Chapter 6 can be omitted.</i>	

Nevada Mathematics Standard

1.0 Numbers, Number Sense and Computation Learning Targets for Trigonometry



Content Standard 1.0: Students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.

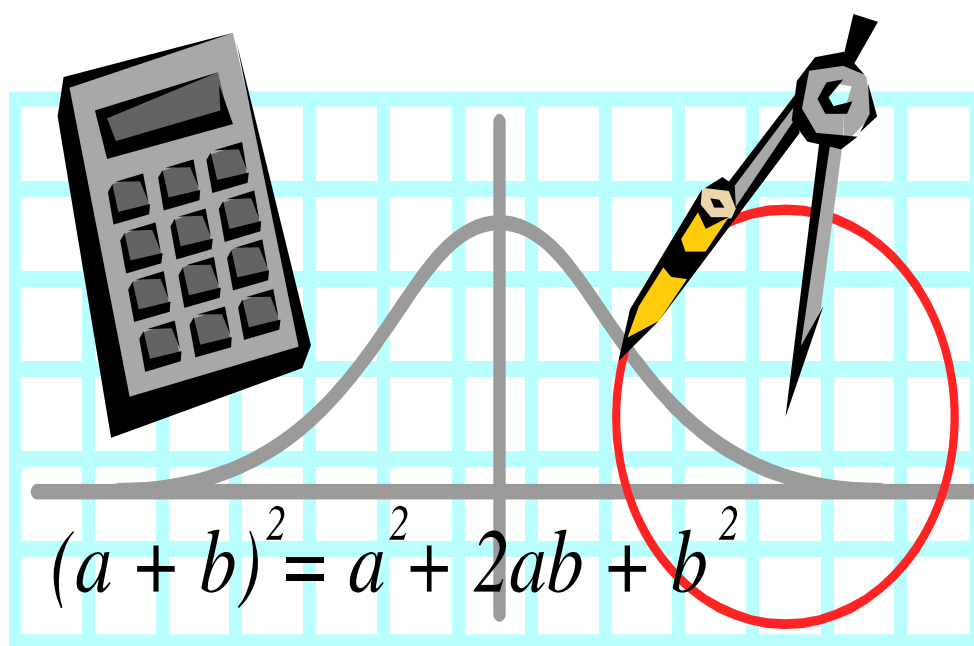
ECSD Trigonometry Learning Objectives 1.ET. _			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
1.12.8 Identify and apply real number properties to solve problems.	a. Know set notation and associated vocabulary. b. Know the subsets of the real numbers (natural, whole, integers, rational, irrational). c. Review real number properties. d. Know, understand, and use the following vocabulary: Integers Rational numbers Irrational numbers Real numbers Natural numbers Whole numbers Real number properties	a. Simplify expressions using real number properties.	a. Apply real number properties to solve problems.
1.ET.1 Simplify radicals. Rationalize denominators. Perform basic operations on irrational numbers.	a. Review the meaning of irrational numbers. b. Review finding exact values of radicals. c. Review the meaning of rationalizing denominators. d. Know, understand, and use the following vocabulary: Conjugate Irrational numbers Radical Rationalize denominators	a. Identify and classify rational and irrational numbers. b. Simplify radical expressions by finding exact values. c. Rationalize the denominator of a rational expression involving irrational numbers.	

ECSD Trigonometry Learning Objectives 1.ET._			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
1.ET.2 Use the imaginary unit i to write complex numbers. Perform basic operations on complex numbers. (Optional) Write complex numbers in trigonometric form.	a. Review the meaning of imaginary numbers. b. Review the meaning of complex numbers. c. Review the meaning of conjugates. d. Review finding the powers of i. e. Know the definition of the absolute value of a complex number. f. (Optional) Know the trigonometric form of complex numbers. g. (Optional) Know DeMoivre's Theorem. h. Know, understand, and use the following vocabulary: Absolute value of complex number Argument Complex conjugate Complex number Complex plane DeMoivre's Theorem Discriminant i Imaginary axis Imaginary part of a complex number Imaginary unit Modulus Real axis Real part of a complex number Standard form of a complex number Trig form of complex numbers	a. Use the imaginary unit i to write complex numbers. b. Perform basic operations on complex numbers written in standard form. c. Use conjugates to divide complex numbers. d. Plot complex numbers in the complex plane. e. (Optional) Write the trigonometric form of complex numbers. f. (Optional) Perform basic operations on complex numbers written in trigonometric form.	a. Use the Quadratic Formula to solve quadratic equations over the complex number system. b. (Optional) Use DeMoivre's Theorem to find powers of complex numbers. c. (Optional) Find nth roots of complex numbers written in both standard and trigonometric forms.

Nevada Mathematics Standard

2.0 Patterns, Functions, and Algebra

Learning Targets for Trigonometry



Content Standard 2.0: Students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.

Nevada State Learning Objectives 2.12._			
Nevada State Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
2.12.2 (E/S) Isolate any variable in given equations, inequalities, proportions, and formulas to use in mathematical and practical situations.	a. Review various types of equations. b. Know, understand, and use the following vocabulary: Inverse trigonometric function Quadratic equation Quadratic form of trigonometric equation Quadratic Formula Radical equation Trigonometric equation	a. Review solving equation in mathematical situations. b. Use standard algebraic methods to solve trigonometric equations in mathematical situations. c. Solve trigonometric equations in quadratic form in mathematical situations. d. Solve trigonometric equations involving multiple angles in mathematical situations. e. Solve trigonometric equations using inverse trigonometric functions in mathematical situations.	a. Review solving equations in practical situations. b. Solve trigonometric equations in practical situations.
2.12.4 (E/S) Determine the domain and range of functions, including linear, quadratic, and absolute value, algebraically and graphically. Solve absolute value equations and inequalities both algebraically and graphically.	a. Review concepts of relation, function, domain, range, and function notation. b. Review appropriate notation for and meaning of composition of functions. c. Know, understand, and use the following vocabulary: Composite function Dependent variable Difference quotient Domain Function Function notation Horizontal line test Independent variable Inverse of a function Range Relation Vertical line test	a. Review determining whether a relation is a function both graphically and algebraically. b. Identify and graph special functions. c. Review finding the domain and range of a function. d. Evaluate a function. e. Find the sum, difference, product and quotient of two functions. f. Find the composition of two functions.	a. Use functions to model and solve real-world problems. b. Evaluate the difference quotient. $\frac{f(x+h) - f(x)}{h}$

ECSD Trigonometry Learning Objectives 2.ET._			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
2.ET.1 Analyze graphs of functions. Identify transformations of functions. Find inverses of functions.	a. Review the vertical line test for functions. b. Review the meaning of the zeros of a function. c. Know the meaning of increasing and decreasing intervals. d. Know the meaning of odd and even functions. e. Know the meaning of relative maximums and minimums. f. Review various transformations of graphs of functions. g. Know meaning of inverse function. h. Know, understand, and use the following vocabulary: Decreasing interval Dilation Even function Horizontal shift Increasing interval Inverse functions Odd function Reflection Relative maximum Relative minimum Transformation Vertical line test Vertical shift Zeros	a. Use the vertical line test to determine if a relation is a function. b. Find the zeros of a function. c. When given the graph of a function, determine the intervals over which the function is increasing and/or decreasing, if any. d. Identify odd and even functions from their graphs. e. Perform indicated transformations on the graphs of functions. f. Find the inverse of a function graphically and determine if the inverse is a function through the use of the horizontal line test.	a. Determine if a function is odd, even, or neither from its equation. b. Find the inverse of a function algebraically and determine if the inverse is a function. c. Use transformations to sketch graphs of functions.
2.ET.2 Write exponential expressions to model growth and decay situations. Calculate compound interest. Simply and evaluate expressions involving logarithms. Solve exponential and logarithmic equations.	a. Know the meanings of exponential and logarithmic functions. b. Know the properties of logarithms. c. Know, understand, and use the following vocabulary: Exponential function Logarithmic function	a. Determine the multiplier for exponential growth and decay. b. Classify an exponential function as representing growth or decay. c. Write equivalent forms for exponential and logarithmic equations. d. Simplify and evaluate expressions involving logarithms.	a. Write exponential expressions to model growth and decay situations. b. Calculate the growth of investments using compound interest formulas. c. Solve logarithmic equations, algebraically and graphically. d. Solve exponential equations, algebraically and graphically. e. Model and solve real-world problems involving exponential and logarithmic relationships.

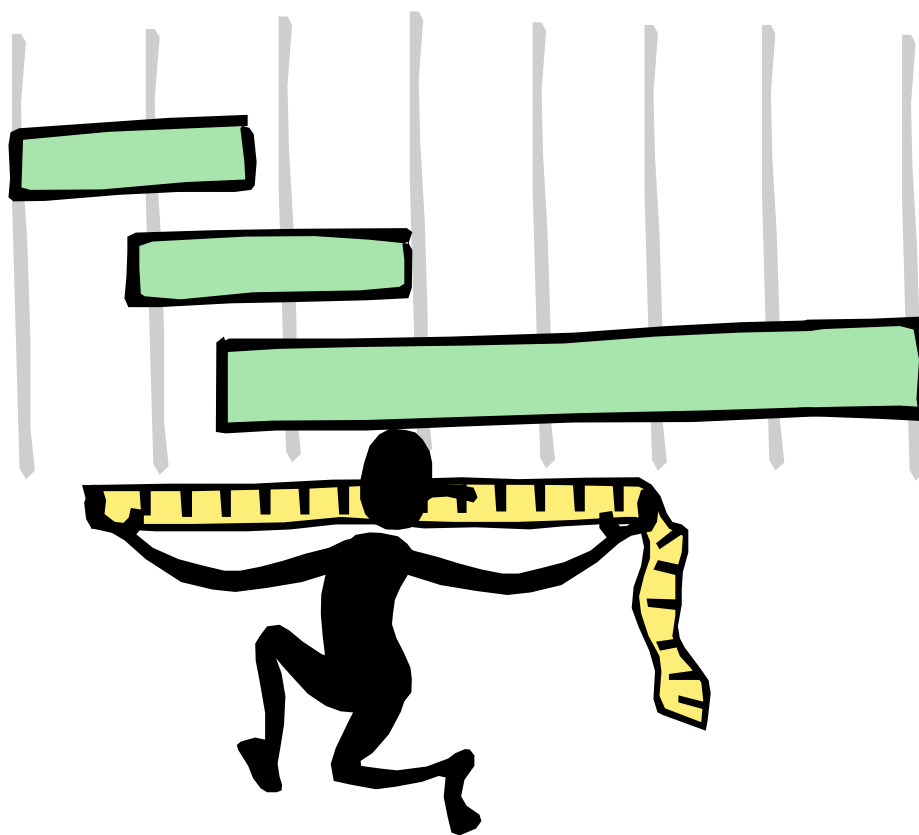
ECSD Trigonometry Learning Objectives 2.ET._			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
2.ET.3 Graph the six trigonometric functions. Perform transformations on the graphs of trigonometric functions.	a. Recognize the graphs of the basic sine and cosine functions. b. Know the domain, range, and period of the sine and cosine functions. c. Know the domain, range, and period of the tangent function. d. Know the domain, range, and period of the cotangent function. e. Know the domain, range, and period of the secant function. f. Know the domain, range, and period of the cosecant function. g. Know the meaning of amplitude and phase shift. h. Know, understand, and use the following vocabulary: Amplitude Phase shift Cosecant Range Cosine Secant Cotangent Sine Domain Tangent Period	a. Sketch and label the graphs of the basic trigonometric functions. b. Determine the amplitude of the graph of a sine or cosine function in mathematic situations. c. Determine the period of the graph of a sine and cosine function in mathematic situations. d. Determine the phase shift of the graph of a sine or cosine function in mathematic situations. e. Sketch and label the graphs of sine and cosine functions in mathematical situations which involve transformations.	a. Determine the amplitude of the graph of a sine or cosine function in practical situations. b. Determine the period of the graph of a sine or cosine function in practical situations. c. Determine the phase shift of the graph of a sine and cosine function in practical situations. d. Sketch and label the graphs of sine and cosine functions in practical situations which involve transformations.
2.ET.4 Plot points on a polar coordinate system. Convert between polar and rectangular coordinates. <i>This unit would be optional as time permits.</i>	a. Know the meaning of the polar coordinate system. b. Recognize special polar graphs. c. Know, understand, and use the following vocabulary: Cardioid Rectangular coordinate system Lemniscate Rectangular coordinates Limaçon Rose Polar coordinate system r-values Polar coordinates Spiral Polar form	a. Convert points from rectangular to polar form and vice versa. b. Convert equations from rectangular to polar form and vice versa. c. Graph a polar equation by plotting points.	a. Recognize special polar shapes from graphs and identify their special properties. b. Graph a polar equation using symmetry, zeros, and maximum r-values.

3.0 Measurement

Learning Targets

for

Trigonometry



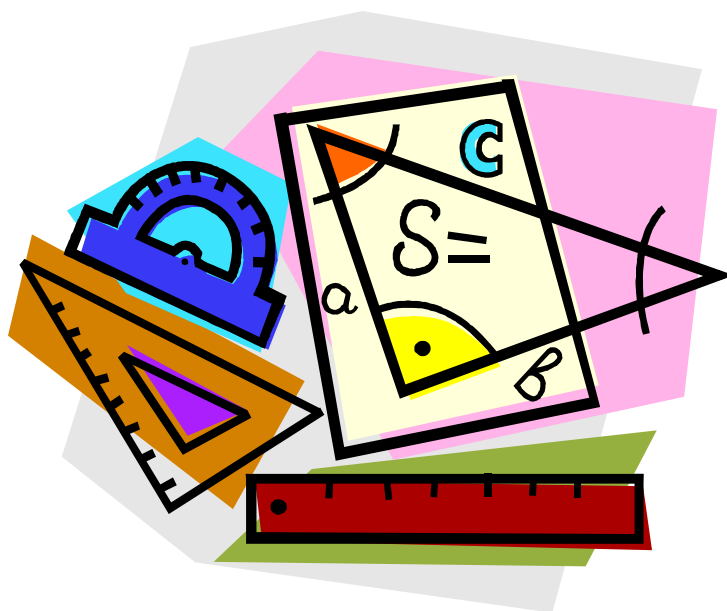
Content Standard 3.0: Students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.

ECSD Trigonometry Learning Objectives 3.ET.____			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
3.ET.1 Convert between radian and degree measures of angles. Determine linear and angular speed of a particle.	a. Review the various parts of an angle. b. Know the meaning of degrees, minutes, and seconds. c. Know the meaning of radian measure of an angle. d. Know the meaning of arc length and how to determine its measure in radians. e. Know the meaning of linear and angular speed. f. Know, understand, and use the following vocabulary: Angular speed Negative angle Arc length Positive angle Clockwise Radian Coterminal angles Revolution Counterclockwise Second Degree Standard position Initial side Terminal side Linear speed Vertex Minute	a. Sketch a graph of an angle in standard position. b. Change the measure of an angle in decimal form to degree, minute, and seconds and vice versa. c. Determine the radian measure of an angle to the indicated decimal place. d. Determine the radian measure of an angle in exact form. e. Convert between the degree measure of angle to radian measure and vice versa. f. Determine the quadrant in which the terminal side of an angle (in standard position) lies. g. Determine coterminal angles for a given angle. h. Determine arc length. i. Determine linear and angular speed in mathematical situations.	a. Determine the measure of an angle in practical situations. b. Determine linear and angular speed in practical situations.

ECSD Trigonometry Learning Objectives 3.ET._			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
3.ET.2 Identify a unit circle and its relationship to real numbers. Evaluate trigonometric functions of any angle using a unit circle. Define and evaluate inverse trigonometric functions. Evaluate composite trigonometric functions.	a. Know the meaning of and recognize a unit circle. b. Know the meaning of quadrantal angles. c. Know the meaning of reference angle. d. Know the meaning of the six trigonometric functions as related to the unit circle. e. Know the meaning of the six inverse trigonometric functions. f. Know the meaning of composite trigonometric functions. g. Know, understand, and use the following vocabulary: Arccosecant Arccosine Arcsecant Arcsin Arctangent Composite trigonometric functions Cosecant Cosine Cotangent Inverse trigonometric functions Quadrantal angle Reference angle Secant Sine Tangent Unit circle	a. Find the exact values of the six trigonometric functions of quadrantal angles and reference angles using the unit circle. b. Find the exact values of the trigonometric functions for an angle with a 45° reference angle using the unit circle. c. Find the exact values of the trigonometric functions for an angle with a 30° reference angle using the unit circle. d. Find the exact values of the trigonometric functions for an angle with a 60° reference angle using the unit circle. e. Evaluate the six inverse trigonometric functions when given exact values. f. Evaluate composite trigonometric functions. g. Graph inverse trigonometric angles.	a. Use trigonometric functions to solve real-world problems. b. Use inverse trigonometric functions to solve real-world problems.

ECSD Trigonometry Learning Objectives 3.ET._			
ECSD Trigonometry Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
3.ET.3 Know and use the Laws of Sines and Cosines. Find the areas of oblique triangles.	a. Know the Law of Sines. b. Know the formulas for finding the area of an oblique triangle based on the Law of Sines and when they are used. c. Know the Law of Cosines. d. Know Heron's Formula for finding the area of an oblique triangle and when it is used. e. Know, understand, and use the following vocabulary: Heron's Theorem Law of Cosines Law of Sines Oblique triangle	a. Use the Law of Sines to solve oblique triangles (AAS, ASA, or SSA) in mathematical situations. b. Find the area of an oblique triangle using formulas based on the Law of Sines in mathematical situations. c. Use the Law of Cosines to solve oblique triangles (SSS or SAS) in mathematical situations. d. Find the area of an oblique triangle using Heron's Theorem in mathematical situations.	a. Use the Law of Sines to solve oblique triangles (AAS, ASA, or SSA) in practical situations. b. Use the Law of Cosines to solve oblique triangles (SSS or SAS) in practical situations. c. Find the area of an oblique triangle in practical situations.

4.0 Spatial Relationships, Geometry, and Logic Learning Targets for Trigonometry



Content Standard 4.0: Students will identify, represent, verify, and apply spatial relationships and geometric properties to solve problems, communicate, and make connections within and beyond the field of mathematics.

Nevada State Learning Objectives 4.12.2			
Nevada State Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	(A2) Procedures/Skills	(A3) Problem Solving/Reasoning
4.12.2 (E/S) Apply properties of similarity through right triangle trigonometry to find missing angles and sides.	a. Know the definition of the sine ratio based on a right triangle. b. Know the definition of the cosine ratio based on a right triangle. c. Know the definition of the tangent ratio based on a right triangle. d. Know the definition of the cotangent ratio based on a right triangle. e. Know the definition of the secant ratio based on a right triangle. f. Know the definition of the cosecant ratio based on a right triangle. g. Know the meaning of inclination, angle of elevation, and angle of depression. h. Know, understand, and use the following vocabulary: Angle of depression Cotangent Angle of elevation Cofunction Cosecant Cosine	a. Find the exact values of the six trigonometric functions for a 45° angle in a right triangle in mathematical situations. b. Find the exact values of the six trigonometric functions for a 30° angle in a right triangle in mathematical situations. c. Find the exact values of the six trigonometric functions for a 60° angle in a right triangle in mathematical situations. d. Solve right triangles using trigonometric ratios in mathematical situations.	a. Find the exact values of the six trigonometric functions for a 45° angle in a right triangle in practical situations. b. Find the exact values of the six trigonometric functions for a 30° angle in a right triangle in practical situations. c. Find the exact values of the six trigonometric functions for a 60° angle in a right triangle in practical situations. d. Solve right triangles using trigonometric ratios in practical situations.

Nevada State Learning Objectives 4.12. <u> </u>			
Nevada State Learning Objectives	ECSD Trigonometry Learning Targets The Student is expected to:		
	(A1) Concepts/Knowledge	Mod (A2) Procedures/Skills	(A3) Problem Solving/Reasoning
4.12.5 (E/S) Determine the slope of lines using coordinate geometry and algebraic techniques. Identify parallel, perpendicular, and intersecting lines by slope. Graph linear equations and find possible solutions to those equations using coordinate geometry. Find possible solution sets of systems of equations whose slopes indicate parallel, perpendicular, or intersecting lines.	a. Review finding the slope of a line and its intercepts. b. Review the slope-intercept form of a line, $y = mx + b$, including the direct variation connection. c. Review the point-slope form of a line, $(y - y_1) = m(x - x_1)$. d. Review the standard form of a line, $Ax + By = C$. e. Review identifying parallel, perpendicular, and intersecting lines by slope. f. Know, understand, and use the following vocabulary: Intersecting lines Slope-intercept form Parallel lines Standard form Perpendicular lines Systems of equations Point-slope form x-intercept Slope y-intercept	a. Review graphing and writing linear equations in various forms (slope-intercept, point-slope, standard).	a. Translate between various forms of linear equations. b. Find solution sets of systems of equations whose slopes indicate parallel, perpendicular, or other intersecting lines. c. Graph the solution set of a linear inequality.

Nevada State Learning Objectives
4.12.

ECSD Trigonometry Learning Targets

The Student is expected to:

Nevada State Learning Objectives	ECSD Trigonometry Learning Targets		
	(A1) Concepts/Knowledge	Mod (A2) Procedures/Skills	(A3) Problem Solving/Reasoning
4.12.7 (I/S) Apply the Pythagorean Theorem and its converse in mathematical and practical situations.	a. Review the Pythagorean Theorem. b. Know the converse of the Pythagorean Theorem. c. Know the relationships between 45-45-90 triangles, isosceles right triangles and squares. d. Know the relationships between the sides of a 45-45-90 triangle. e. Know the relationships between 30-60-90 triangles, equilateral triangles, and hexagons. f. Know the relationships between the sides of a 30-60-90 triangle. g. Know, understand, and use the following vocabulary: Converse of Pythagorean Theorem Equilateral Triangle Isosceles Right Triangle Pythagorean Theorem Triangle (30-60-90) Triangle (45-45-90)	a. Apply the Pythagorean Theorem in mathematical situations. b. Apply the converse of the Pythagorean Theorem in mathematical situations. c. Use properties of 45-45-90 triangles to solve mathematical problems. d. Use properties of 30-60-90 triangles to solve mathematical problems.	a. Apply the Pythagorean Theorem in practical situations. b. Apply the converse of the Pythagorean Theorem in practical situations. c. Use properties of 45-45-90 triangles to solve practical problems. d. Use properties of 30-60-90 triangles to solve practical problems.
4.12.9 (I/S) Formulate, evaluate, and justify arguments using inductive and deductive reasoning in mathematical and practical situations.	a. Recognize fundamental trigonometric identities. b. Recognize the sum and difference identities for sine and cosine. c. Recognize the double angle identities for sine and cosine. d. (Optional) Recognize the half angle identities for sine and cosine. e. Know, understand, and use the following vocabulary: Basic trigonometric identities Cofunction identities Difference identities Double angle identities Even/odd identity Half angle identities Pythagorean identities Reciprocal identity Quotient identities Sum identities Trigonometric expression	a. Use fundamental trigonometric identities to evaluate trigonometric functions in mathematical situations. b. Simplify trigonometric expressions using the fundamental trigonometric identities, basic operations, and factoring.	a. Use fundamental trigonometric identities to evaluate trigonometric functions in practical situations. b. Verify trigonometric identities.