

Adair County High School

2020-2021

9-12 MATH STANDARDS - Conceptual Category-Function / PACING GUIDE

5 Key Skills

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Functions-Interpreting Functions

Cluster: [Understand the concept of a function and use function notation](#)

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.1 Understand properties and key features of functions and the different ways functions can be represented. (MP.2, MP.4, MP.7)					
<p>a. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x.</p>	<p>Identify relations and functions and their domain and range.</p> <p>Recognize and use function notation.</p>	<p>Unit - Relations & Functions</p>	<p>Domain Range Function notation Independent Dependent</p>	<p>All Things Algebra I-Unit Relations and Functions Kuta Software</p>	<p>Algebra I</p>
		<p>Unit - Linear Functions and Systems</p>		<p>All Things Algebra II - Unit Linear Functions and Systems Kuta Software</p>	<p>Algebra II</p>
		<p>Unit - Functions and Their Graphs</p>		<p>Pre-Calculus/Larson and Hostetler Unit Functions and Their Graphs Kuta Software</p>	<p>Pre-Calculus</p>
<p>b. Using appropriate function notation, evaluate functions for inputs in their domains and interpret statements that use function notation in terms of a context.</p>	<p>Recognize and use function notation.</p>	<p>Unit - Relations and Functions</p>	<p>Function notation Functions Domain Range Evaluate</p>	<p>All Things Algebra I-Unit Relations and Functions Kuta Software</p>	<p>Algebra I</p>
		<p>Unit - Linear Functions & Systems</p>		<p>All Things Algebra II - Unit Linear Functions and Systems Kuta Software</p>	<p>Algebra II</p>
		<p>Unit - Functions & Their Graphs</p>		<p>Pre-Calculus/Larson and Hostetler Unit Functions and Their Graphs Kuta Software</p>	

					Pre-Calculus
c. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities and sketch graphs showing key features given a verbal description of the relationship.	Define and recognize the key features in tables and graphs of linear functions: intercepts, intervals where the function is increasing, decreasing, positive or negative, and end behavior.	Unit - Relations & Functions Unit - Linear Functions & Systems Unit - Solving Quadratics Unit - Polynomial Functions Functions - Prerequisites	Function Intercept Solutions Zeros Roots Increasing intervals Decreasing intervals End behavior	All Things Algebra I-Unit Relations and Functions Kuta Software All Things Algebra II - Unit Linear Functions and Systems Unit Solving Quadratics Unit Polynomial Functions Kuta Software Pre-Calculus/Larson and Hostetler Unit Prerequisites Kuta Software	Algebra I Algebra II PreCalculus
d. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	Identify and explain why a domain is appropriate for a given situation/graph.	Unit - Relations & Functions Unit - Linear Functions & Systems	Domain Input Range Output Practical domain	All Things Algebra I-Unit Relations and Functions Kuta Software All Things Algebra II - Unit Linear Functions and Systems Kuta Software	Algebra I Algebra II
e. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Graph functions, by hand in simple cases or using technology for more complicated cases, and show/label maxima and minima of the graph, identify zeros, describe the end behavior and identify the domain and range.	Unit - Relations & Functions Unit - Linear Functions & Systems Unit - Functions & Their Graphs	Functions Domain Range Minimum values Maximum values Zeros X-intercepts Roots End behavior	All Things Algebra I-Unit Relations and Functions Kuta Software All Things Algebra II - Unit Linear Functions and Systems Kuta Software Pre-Calculus/Larson and Hostetler Unit Functions and Their Graphs Kuta Software	Algebra I Algebra II Pre-Calculus
KY.HS.F.2 (MP.7, MP.8) Recognize that arithmetic and	Recognize that geometric sequences can be	Unit - Relations & Functions	Arithmetic sequences Geometric sequences	All Things Algebra I-Unit Relations and Functions	Algebra I

geometric sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	expressed as exponential functions. Recognize that arithmetic sequences can be expressed as linear functions.	Unit - Exponents Rules Unit - Sequences & Series	Recursive Domain Subset Integers Exponential function Linear function	Unit Exponent Rules Kuta Software All Things Algebra II - Unit Sequences and Series Kuta Software	Algebra II
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Functions - Interpreting Functions

Cluster: Interpret functions that arise in applications in terms of the context

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.3 Understand average rate of change of a function over an interval (MP.2, MP.4)					
a. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.	Calculate and interpret rate of change of a function (presented symbolically or as a table) over a specified interval.	Unit - Linear Equations Unit - Linear Functions & Systems	Rate of change Slope Constant Rise/Run	Kuta Software All Things Algebra I -Linear Equations All Things Algebra II - Unit Linear Functions & Systems Kuta Software	Algebra I Algebra II
b. Estimate the rate of change from a graph. ★	Estimate rate of change from a graph of a specified interval.	Unit - Linear Equations Unit - Linear Functions & Systems	Rate of change Vertical change Horizontal change rise/run	Kuta Software All Things Algebra I - Linear Equations Kuta Software All Things Algebra II-Linear Functions & Systems	Algebra I Algebra II

Functions-Interpreting Functions

Cluster: Analyze functions using different representations

Standard	Learning Target	Window of	Essential Vocabulary	Resources	Course Name
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	We are learning to.....	Instruction (weeks)			
KY.HS.F.4 Graph functions expressed symbolically and show key features of the graph, with and without using technology (computer, graphing calculator) ★ (MP.4, MP.5)					
a. Graph linear and quadratic functions and show intercepts, maxima and minima.	<p>Graph linear functions using a table of values, x and y-intercepts, or slope-intercept form.</p> <p>Graph quadratic functions with and without technology and identify/interpret zeroes and extreme values.</p>	<p>Unit - Linear Functions & Systems Unit - Quadratic Equations</p> <p>Unit 0 Solving Quadratics & Complex Numbers</p> <p>Unit - Polynomial & Rational Functions</p>	<p>Quadratic Intercepts Maxima Minima Slope-intercept Point-slope</p>	<p>Kuta Software All Things Algebra I-Linear Functions & Systems Unit Quadratic Equations</p> <p>All Things Algebra II-Solving Quadratics & Complex numbers Kuta Software</p> <p>Pre-Calculus/Larson and Hostetler Unit- Polynomial and Rational Functions KUTA Software</p>	<p>Algebra I</p> <p>Algebra II</p> <p>Pre-Calculus</p>
b. Graph square root, cube root and absolute value functions.	Graph with and without technology absolute value, square root, and cubed root functions.	<p>Unit - Relations & Functions</p> <p>Unit - Linear Functions Unit - Parent Functions & Transformations Unit - Radical Functions</p> <p>Unit - Polynomial & Rational Functions</p>	<p>Square root Cubed Root Absolute value</p>	<p>Kuta Software All Things Algebra I- Unit Relations & Functions</p> <p>All Things Algebra II - Unit Linear Functions Unit Parent Functions and Transformations Unit Radical Functions Kuta Software</p> <p>Pre-Calculus/Larson and Hostetler Unit- Polynomial and Rational Functions Kuta Software</p>	<p>Algebra I</p> <p>Algebra II</p> <p>Pre-Calculus</p>
c. Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior.	Graph functions, by hand in simple cases or using technology for more complicated cases, and	Unit - Polynomial Functions	<p>Polynomial function Zeros Factors End behavior</p>	<p>Kuta Software All Things Algebra II-Polynomial Functions</p> <p>Pre-Calculus/Larson and Hostetler</p>	Algebra II

	show/label maxima and minima of the graph, identify zeros, describe the end behavior and identify the domain and range.		Maxima Minima Domain Range	Unit- Polynomial and Rational Functions Kuta Software	Pre-Calculus
d. Graph exponential and logarithmic functions, showing intercepts and end behavior.	Graph and identify the key features of exponential and logarithmic functions (including natural logarithm).	Unit - Exponential & Logarithmic Functions Unit - Exponential & Logarithmic Functions	Exponential Function Logarithmic Function Natural logarithms End Behavior	Kuta Software All Things Algebra II -Unit Exponential & Logarithmic Functions Pre-Calculus/Larson and Hostetler Unit- Exponential and Logarithmic Functions Kuta Software	Algebra II Pre-Calculus
e. (+) Graph trigonometric functions, showing period, midline and amplitude	Graph trigonometric functions, by hand in simple cases or using technology for more complicated cases, and for trigonometric functions, show period, midline, and amplitude.	Unit - Trigonometry	Trigonometric functions Period Midline Amplitude	Pre-Calculus/Larson and Hostetler Unit- Trigonometry Kuta Software	Pre-Calculus
f. (+) Graph piecewise functions, including step functions.	Identify and graph a piecewise and step functions and identify their domain and range.	Unit - Parent Functions & Transformations Unit - Polynomial & Rational Functions	Piece-wise function Asymptote Step function Domain Range	Kuta Software All Things Algebra II-Unit Parent Functions & Transformations Pre-Calculus/Larson and Hostetler Unit- Polynomial and Rational Functions Kuta Software	Algebra II Pre-Calculus
g. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available and showing end behavior.	Graph rational functions, by hand in simple cases or using technology for more complicated cases, and identify all zeros and asymptotes, describe the end behavior and identify the domain and	Unit - Polynomial & Rational Functions	Rational functions Zeros Asymptotes Factors End behavior Domain Range	Pre-Calculus/Larson and Hostetler Unit- Polynomial and Rational Functions Kuta Software	Pre-Calculus

	range.				
KY.HS.F.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (MP.3, MP.6)					
a. Identify zeros, extreme values and symmetry of the graph within the context of a quadratic function.	Given a quadratic function, interpret zeros, extreme values, and symmetry of the graph in terms of a real-world context.	Unit - Quadratic Equations	Zeros Extreme values Symmetry Quadratic	Kuta Software All Things Algebra I - Unit Quadratic Equations	Algebra I
		Unit - Solving Quadratics & Complex Numbers		All Things Algebra II- Unit Solving Quadratics and Complex Numbers Kuta Software	Algebra II
		Unit - Polynomial & Rational Functions		Pre-Calculus/Larson and Hostetler Unit- Polynomial and Rational Functions Kuta Software	Pre-Calculus
b. Use the properties of exponents to interpret expressions for exponential functions and classify the exponential function as representing growth or decay.	Define and recognize the key features in tables and graphs of exponential functions: intercepts, intervals where the function is increasing or decreasing and identify as growth or decay.	Unit - Exponential and Logarithmic Functions	Properties of exponents Exponential function Growth Decay Increasing function Decreasing function Intercepts	Kuta Software All Things Algebra II -Unit Exponential & Logarithmic Functions	Algebra II
		Unit - Exponential and Logarithmic Functions		Pre-Calculus/Larson and Hostetler Unit- Exponential and Logarithmic Functions Kuta Software	Pre-Calculus

Functions-Building Functions

Cluster: [Build a function that models a relationship between two quantities](#)

Standard	Learning Target We are learning to.....	Windows of instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.6 Write a function that describes a relationship between two quantities. ★ (MP.4, MP.7)					
a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	Use arithmetic and geometric sequences to model real life situations both explicitly and recursively to solve real world problems.	Unit - Sequences and Series	Recursive Explicit Common difference Common ratio	Kuta Software All Things Algebra II - Unit Sequences & Series	Algebra II

<p>b. Combine standard function types using arithmetic operations.</p>	<p>Add, subtract, multiply, divide and find the composition of functions.</p>	<p>Unit - Linear Functions and Systems</p> <p>Unit - Functions and Their Graphs</p>	<p>Like terms Composition Rational</p>	<p>Kuta Software All Things Algebra II - Unit Linear Functions & Systems</p> <p>Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs Kuta Software</p>	<p>Algebra II</p> <p>Pre-Calculus</p>
<p>c. (+) Compose functions.</p>	<p>Add, subtract, multiply, divide and find the composition of functions.</p> <p>Combine two functions using the operations of addition, subtraction, multiplication, division or the composition given real world situation or mathematical problems.</p>	<p>Unit - Linear Functions and Systems</p> <p>Unit - Functions and Their Graphs</p>	<p>Composition Rational</p>	<p>Kuta Software All Things Algebra II - Unit Linear Functions & Systems</p> <p>Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs Kuta Software</p>	<p>Algebra II</p> <p>Pre-Calculus</p>
<p>KY.HS.F.7 Use arithmetic and geometric sequences to model situations and scenarios. (MP.4, MP.8)</p>					
<p>a. Use formulas (explicit and recursive) to generate terms for arithmetic and geometric sequences.</p>	<p>Generate arithmetic and geometric sequences from recursive and explicit formulas.</p>	<p>Unit - Linear Equations Unit - Exponent Rules</p> <p>Unit - Sequences and Series</p> <p>Unit - Sequences, Series, and Probability</p>	<p>Explicit Recursive Arithmetic sequence Geometric sequence</p>	<p>Kuta Software All Things Algebra I- Unit Linear Equations Unit Exponent Rules</p> <p>All Things Algebra II - Unit Sequences & series</p> <p>Pre-Calculus/Larson and Hostetler Unit- Sequences, Series, and Probability Kuta Software</p>	<p>Algebra I</p> <p>Algebra II</p> <p>Pre-Calculus</p>
<p>b. Write formulas to model arithmetic and geometric sequences and apply those formulas in realistic situations. ★</p>	<p>Use arithmetic and geometric sequences to model real life situations and solve real world problems.</p>	<p>Unit - Linear Equations Unit - Exponent Rules</p>	<p>Mortgage Simple interest Arithmetic sequence Geometric sequence Series</p>	<p>Kuta Software All Things Algebra I - Linear Equations / Exponent Rules</p> <p>All Things Algebra II - Sequences and Series</p>	<p>Algebra I</p>

		Unit - Sequences and Series Unit - Sequences, Series, and Probability		Pre-Calculus/Larson and Hostetler Unit- Sequences, Series, and Probability Kuta Software	Algebra II Pre-Calculus
c. (+) Translate between recursive and explicit formulas.	Compare the results of both recursive and explicit formulas.	Unit - Sequences, Series, and Probability	Recursive formula Explicit formula	Pre-Calculus/Larson and Hostetler Unit- Sequences, Series, and Probability Kuta Software	Pre-Calculus

Functions - Building Functions

Cluster: Build new functions from existing functions

Standard	Learning Target We are learning to.....	Windows of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.8 Understand the effects of transformations on the graph of a function. (MP.3, MP.5)					
a. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$ and $f(x+k)$ for specific values of k (both positive and negative); find the value of k given the graphs.	With or without technology, identify effects of single transformations on graphs of functions.	Unit - Relations and Functions Unit - Parent Functions and Transformations Unit - Functions and Their Graphs	Transformation Function notation Even/odd functions Vertical stretch Vertical shrink Reflections	Kuta Software All Things Algebra I - Relations and Functions KUTA Software All Things Algebra II - Parent Functions and Transformations Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs Kuta Software	Algebra I Algebra II Pre-Calculus
b. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	Describe the differences and similarities between a parent function and the transformed function.	Unit - Relations and Functions Unit - Parent Functions and Transformations Unit - Functions and Their Graphs	Appropriate use of technology Parent function Reflections	Kuta Software All Things Algebra I - Relations and Functions KUTA Software All Things Algebra II - Parent Functions and Transformations Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs	Algebra I Algebra II

				Kuta Software	Pre-Calculus
KY.HS.F.9 Find inverse functions. (MP.2, MP.6)					
a. Given the equation of an invertible function, find the inverse.	Define and find the inverse of a function.	Unit - Linear Functions and Systems Unit - Functions and Their Graphs	Inverse Coordinates Reflection	Kuta Software All Things Algebra II - Linear Functions and Systems Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs Kuta Software	Algebra II Pre-Calculus
b. (+) Verify by composition that one function is the inverse of another.	Verify two functions are inverses by using function composition to show $f(g(x)) = x$ and $g(f(x)) = x$.	Unit - Linear Functions and Systems Unit - Functions and Their Graphs	$f(g(x))=x$ $g(f(x))=x$ Inverse	Kuta Software All Things Algebra II - Linear Functions and Systems Pre-Calculus/Larson and Hostetler Unit- Functions and Their Graphs Kuta Software	Algebra II Pre-Calculus
c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	Identify whether or not a function has an inverse by a graph or table of values.	Unit - Linear Functions and Systems	Coordinates Reflection Inverse	Kuta Software All Things Algebra II - Linear Functions and Systems	Algebra II
d. (+) Produce an invertible function from a non-invertible function by restricting the domain.	Restrict the domain of a non-invertible function in order to create an invertible function.	Unit - Linear Functions and Systems Unit - Functions and Their Graphs	$f(x)=x^2$, x is greater than or equal to 0	Kuta Software All Things Algebra II Unit- Linear Functions and Systems Pre-Calculus/Larson and Hostetler Unit-Functions and Their Graphs Kuta Software	Algebra II Pre-Calculus
KY.HS.F.10 (MP.1, MP.7) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and	Convert exponential equations to logarithmic form and logarithmic equations to exponential	Unit - Exponential and Logarithmic Functions	Inverse Exponents Logarithms	Kuta Software All Things Algebra II - Exponential and Logarithmic Functions	Algebra II

exponents with the use of technology.	<p>form.</p> <p>Solve exponential equations by using logarithms.</p> <p>Solve logarithmic equations using exponents.</p>	Unit Exponential and Logarithmic Functions		<p>KUTA Software</p> <p>Pre-Calculus/Larson and Hostetler</p> <p>Unit- Exponential and Logarithmic Functions</p>	Pre-Calculus
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Functions-Linear, Quadratic and Exponential Functions

Cluster: Construct and compare linear, quadratic and exponential models and solve problems

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.11 Distinguish between situations that can be modeled with linear functions and with exponential functions (MP.3, MP.8)					
a. Recognize and justify that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.	<p>Recognize that geometric sequences can be expressed as exponential functions.</p> <p>Recognize that arithmetic sequences can be expressed as linear functions.</p>	<p>Unit - Sequences and Series</p> <p>Unit - Sequences, Series, and Probability</p>	<p>Linear function</p> <p>Exponential function</p> <p>Factors</p> <p>Intervals</p> <p>growth/decay</p>	<p>Kuta Software</p> <p>All Things Algebra II - Sequences and Series</p> <p>Pre-Calculus/Larson and Hostetler</p> <p>Unit- Sequences, Series, and Probability</p> <p>Kuta Software</p>	<p>Algebra II</p> <p>Pre-Calculus</p>
b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	<p>Recognize that arithmetic sequences can be expressed as linear functions.</p>	<p>Unit - Sequences and Series</p> <p>Unit - Sequences, Series, and Probability</p>	<p>Constant rate</p> <p>Intervals</p> <p>Linear function</p>	<p>Kuta Software</p> <p>All Things Algebra II - Sequences and Series</p> <p>Pre-Calculus/Larson and Hostetler</p> <p>Unit- Sequences, Series, and Probability</p> <p>Kuta Software</p>	<p>Algebra II</p> <p>Pre-Calculus</p>
c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	<p>Recognize that geometric sequences can be expressed as exponential functions.</p>	<p>Exponential & Logarithmic Functions</p>	<p>Growth</p> <p>Decay</p> <p>Constant percent rate</p>	<p>Kuta Software</p> <p>All Things Algebra II Unit-Sequences and Series</p> <p>Unit-Exponential and Logarithmic Functions</p>	<p>Algebra II</p>

				Pre-Calculus/Larson and Hostetler Unit- Sequences, Series, and Probability Unit-Exponential and Logarithmic Functions Kuta Software	Pre-Calculus
KY.HS.F.12 (MP.7, MP.8) Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Recognize that geometric sequences can be expressed as exponential functions. Recognize that arithmetic sequences can be expressed as linear functions.	Sequences and Series Sequences & Series Probability	Arithmetic Geometric Sequence	Kuta Software All Things Algebra II Unit-Sequences and Series Pre-Calculus/Larson and Hostetler Unit- Sequences, Series, and Probability Kuta Software	Algebra II Pre-Calculus
KY.HS.F.13 (MP.7, MP.8) Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	Examine extremes of exponentials as compared to linear/quadratic functions.	Exponential & Logarithmic Functions	Exponential Growth vs Exponential Decay Compare Models	Kuta Software All Things Algebra II - Exponential and Logarithmic Functions KUTA Software Pre-Calculus/Larson and Hostetler Unit- Exponential and Logarithmic Functions	Algebra II Pre-Calculus

Functions - Linear, Quadratic and Exponential Functions

Cluster: Interpret expressions for functions in terms of the situation they model

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.14 (MP.1, MP.2) Interpret the parameters in a linear or exponential function in terms of a context.	Interpret solutions as viable or nonviable options for linear or exponential functions.	Relations & Functions Linear Functions and Systems Exponential and Logarithmic Functions	Parameters Linear function Exponential function Growth Decay	Kuta Software All Things Algebra I - Relations and Functions KUTA Software All Things Algebra II - Linear Functions and Systems / Exponential and Logarithmic Functions	Algebra I Algebra II

Functions - Trigonometric Functions

Cluster: Extend the domain of trigonometric functions using the unit circle

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.15 (+) (MP.1, MP.6) Understand the relationship of radian measure of an angle to its arc length.	Relate radian measure to the arc length of a circle. Define arc length as a product of the length of radius and the central angle measure in radians.	Trigonometry	Radian measure Arc length Domain	Kuta Software All Things Algebra II - Trigonometry Pre-Calculus/Larson and Hostetler Unit- Trigonometry Kuta Software	Algebra II Pre-Calculus
KY.HS.F.16 (+) Understand and use the unit circle. (MP.7, MP.8)					
a. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	Use the unit circle to find and identify multiple trigonometric values for specified angles.	Trigonometry	Unit Circle Coordinate Trigonometric Functions Radians	Kuta Software All Things Algebra II Unit-Trigonometry Pre-Calculus/Larson and Hostetler Unit- Trigonometry Kuta Software	Algebra II Pre-Calculus
b. Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$ and use the unit circle to express the values of sine, cosine and tangent for $\pi-x$, $\pi+x$ and $2\pi-x$ in terms of their values for x , where x is any real number.	Use sine, cosine, and tangent ratios to find the sides or angles of right triangles. Use the unit circle and coordinates to identify the sine, cosine, and tangent of quadrant angles.	Trigonometry	Special Triangle Common Angles Quadrant Angle Trigonometric Functions Sign values of trigonometric	Kuta Software All Things Algebra II - Trigonometry Pre-Calculus/Larson and Hostetler Unit- Trigonometry Kuta Software	Algebra II Pre-Calculus
c. Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	Use the unit circle to find trigonometric values for a specified angle and how those values are transposed in other	Trigonometry	Unit Circle Symmetry Period Trigonometric Functions	Kuta Software All Things Algebra II - Trigonometry Pre-Calculus/Larson and Hostetler Unit- Trigonometry	Algebra II Pre-Calculus

quadrants of the circle.

Kuta Software

Functions - Trigonometric Functions

Cluster: Model periodic phenomena with trigonometric functions

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.17 (+) (MP.4, MP.5, MP.6) Choose trigonometric functions to model periodic phenomena with specified period, midline and amplitude. ★	Define and recognize the amplitude, period, frequency, and midline parameters in a trigonometric function	Trigonometry	Period Midline Amplitude Period Phase shifts	Pre-Calculus/Larson and Hostetler Unit- Trigonometry Kuta Software	Pre-Calculus
KY.HS.F.18 (+) (MP.2, MP.3) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.			Domain Inverse Increasing Decreasing		N/A
KY.HS.F.19 (+) (MP.4, MP.5) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology and interpret them in terms of the context.	Identify the inverse and reciprocal functions are used in helping to solve trigonometric problems.	Analytic Trigonometry	Inverse functions Trigonometric functions	Pre-Calculus/Larson and Hostetler Unit-Analytic Trigonometry Kuta Software	Pre-Calculus

Functions - Trigonometric Functions

Cluster: Prove and apply trigonometric identities

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary	Resources	Course Name
KY.HS.F.20 (+) Proving identities and formulas within the context of trigonometry (MP.3, MP.7)					
a. Prove the Pythagorean identity and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	Use knowledge of the Pythagorean Theorem and trigonometric functions to find the	Trigonometry and Analytic Trigonometry	Pythagorean Identity Quadrant Angle	Pre-Calculus/Larson and Hostetler Unit-Trigonometry and Analytic Trigonometry Kuta Software	Pre-Calculus

	sine, cosine, and tangent values of a specified angle				
b. Prove the addition and subtraction formulas for sine, cosine and tangent and use them to solve problems.	Use the knowledge of trigonometric identities to prove the sum or difference formulas Use the sum or difference formulas to solve problems	Analytic Trigonometry	Sum or Difference Formulas	Pre-Calculus/Larson and Hostetler Unit-Analytic Trigonometry Kuta Software	Pre-Calculus