



PreCalculus UNIT PLANNER



Unit title	Unit 2 –Trigonometric Functions	Unit duration	5 Weeks
Essential Questions (OR GUIDING QUESTIONS?)			
<ul style="list-style-type: none"> • How can special right triangles help us find the coordinates of certain angles on the unit circle? • How does symmetry help us extend our knowledge of the unit circle to an infinite number of angles? • Why does the calculator only give one answer for an inverse trig function? Shouldn't there be infinite answers? • How do inverse trigonometric functions help us solve equations? 			
Assessments			
<p>Common Formative Assessment: Graphing Sine & Cosine Functions Modelling Sinusoidal Functions – Group Quiz Graphing Other Trig Functions / Solving Trigonometric Expressions Using Inverses</p> <p>Common Summative Assessment: Unit 2 Summative Assessment</p>			
Content Standards			
<p><u>Build new functions from existing functions</u> MGSE9-12.F.BF.4 Find inverse functions. MGSE9-12.F.BF.4d Produce an invertible function from a non-invertible function by restricting the domain.</p> <p><u>Extend the domain of trigonometric functions using the unit circle</u> MGSE9-12.F.TF.2 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. MGSE9-12.F.TF.3 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. MGSE9-12.F.TF.4 Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.</p> <p><u>Model periodic phenomena with trigonometric functions</u> MGSE9-12.F.TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.</p> <p><u>Model periodic phenomena with trigonometric functions</u> MGSE9-12.F.TF.6 Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.</p>			

MGSE9-12.F.TF.7 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.

Interpret functions that arise in applications in terms of the context

MGSE9-12.F.IF.4 Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

Analyze functions using different representations

MGSE9-12.F.IF.7 Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.

MGSE9-12.F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Learning Activities and Experiences

Topic	Resource	Content Covered	Standards Addressed
Graphing and Modeling with Trig Functions	7-4 Graphing Sine and Cosine Functions Pearson enVision pg. 383 – 391	<ul style="list-style-type: none"> Graph and identify the key features of sine and cosine functions. Compare key features of different periodic functions. 	MGSE9-12.F.TF.2 MGSE9-12.F.TF.3 MGSE9-12.F.TF.4 MGSE9-12.F.TF.5 MGSE9-12.F.IF.7, 7e MGSE9-12.F.IF.4
	7-5 Graphing Other Trig Functions Pearson enVision pg. 392 - 399	<ul style="list-style-type: none"> Describe and compare key features of the graphs of trigonometric functions. Graph functions of the form $f(x) = a \tan bx$ and relate the graph of a function to the graph of the parent function. 	MGSE9-12.F.TF.2 MGSE9-12.F.TF.3 MGSE9-12.F.TF.4 MGSE9-12.F.TF.5 MGSE9-12.F.IF.7, 7e MGSE9-12.F.IF.4
	7-6 Translating Trigonometric Functions Pearson enVision pg. 400 - 407	<ul style="list-style-type: none"> Identify how changing the parameters of the sine or cosine function affects the graph of the function. Use trigonometric functions to model situations with specified amplitude, frequency, and midline. 	MGSE9-12.F.TF.2 MGSE9-12.F.TF.3 MGSE9-12.F.TF.4 MGSE9-12.F.TF.5 MGSE9-12.F.IF.7, 7e MGSE9-12.F.IF.4
	Modeling with Sinusoidal Functions (DOE Task)	<ul style="list-style-type: none"> Create tables of values and equations to model real world scenarios Use sinusoidal equations to find values related to the scenario. 	MGSE9-12.F.TF.5
	Additional Resources:		
Inverse Trig Functions	Inverse of Trigonometric Functions (DOE Task)	<ul style="list-style-type: none"> Explore the meaning of inverse function numerically, algebraically, and graphically. Solve some basic trigonometric equations using inverse functions. 	MGSE9-12.F.BF.4, 4d MGSE9-12.F.TF.6 MGSE9-12.F.TF.7

Additional Resources:
8-1 Solving Trigonometric Equations using Inverses
Pearson enVision pg. 415 – 422

Personalized Learning and Differentiation

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

- SWD/504- Accommodations provided
- ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports
- Intervention Support- Re-teaching Activities in Small Groups with Progress Monitoring
- Extensions- Enrichment Tasks and Projects

Resources

DOE Framework Tasks
Pearson enVision Textbook and Pearson Realize Online Resources

