HPISD Curriculum: Pre Calculus Pre-AP

Title	Estimated Duration	6 Weeks					
Unit 2: Graphing Trigonometric Functions	14 days	**1**	2	3	4	5	6

Unit Overview

Graphing Trigonometric Functions

Generalizations/Enduring Understandings

The student will understand that:	• The equations of the trigonometric functions are directly related to the shape of their corresponding graphs. • There is a relationship between the graphs of trigonometric functions and the graphs of their reciprocals. • Trigonometric graphs are related to the unit circle. • Trigonometric graphs can be used to model real life situations.

Concepts	Guiding/Essential Questions
• graphs • functions	• How can changing one number in the equation of a trigonometric function have an effect on its graph? • Why do the reciprocal graphs of sine and cosine have asymptotes? • How are the graphs of the six trigonometric equations related to the unit circle? • How can a sine or cosine curve represent real life situations?

Learning Targets

Students will graph all six trigonometric functions and choose one to effectively model a real life situation.

Formative Assessments	Summative Assessments

TEKS:	Processes and Skills: What students should be able to DO	Facts: What students should KNOW
Graph exponential, logarithmic, rational, polynomial, power, trigonometric, inverse trigonometric and piecewise defined functions, including step functions. **P.2.F** Graph functions, including exponential, logarithmic, sine, cosine, rational, polynomial, and power functions and their transformations, including $af(x)$, $f(x)+d$, $f(x-c)$, $f(bx)$ for specific values of a, b, c, and d, in mathematical and real-world problems. **P.2.G** Graph arcsin(x) and arcos(x) and describe the limitations on the domain. **P.2.H** Determine and analyze the key features of exponential, logarithmic, rational, polynomial, power, trigonometric, inverse trigonometric, and piecewise defined functions, including step functions such as domain, range, symmetry, relative maximum, relative minimum, zeros, asymptotes, and intervals over which the function is increasing or decreasing. **P.2.I** Develop and use a sinusoidal function that models a situation in mathematical and real-world problems. **P.2.O** Graph points in the polar coordinate system and convert between rectangular coordinates and polar coordinates **P.3.D** Graph polar equations such as cardoids, limacons, or lemniscates by plotting points and using technology. **P.3.E** Generate and solve trigonometric equations in mathematical and real-world problems. **P.5.N**	• Graph all six trigonometric functions. • Determine the domain and range of trigonometric functions from the graph. • Determine the relationship between the equation and graph of the trigonometric function. • Use transformations to change the graph of a trigonometric function from the parent function. • Determine where the asymptotes of tangent and the reciprocal functions occur. • Use trigonometric functions to model real life situations. • Write the trigonometric equation from the graph.	• Periodic functions repeat their graphic behavior after a specific interval (period). • Reciprocal trigonometric functions are cosecant, secant and cotangent. • Sinusoidal axis occurs in the sine and cosine functions. It is the horizontal axis which divides the graph of the functions into half. • Transformations can include changes in amplitude (height), period (interval after which the function repeats), phase shift (left-right shift), and vertical shift (up-down shift). • How the graphs of the trigonometric functions are connected to the unit circle. • There are restrictions on the domain and/or range of all six trigonometric functions.

Topics

Graphing trigonometric functions

Language of Instruction		
amplitude period	periodic functions phase shift	reciprocal functions sinusoidal axis vertical shift

State Assessment Connections	National Assessment Connections

Resources