

HPISD Precalculus Pre-AP TAG

The student uses mathematical processes to acquire and demonstrate mathematical understanding.							
The student is expected to:							
Mathematical Process Standards	Six Weeks:	1	2	3	4	5	6
	Apply mathematics to problems arising in everyday life, society, and the workplace. P.1.A.	X	X	X	X	X	X
	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. P.1.B.	X	X	X	X	X	X
	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. P.1.C.	X	X	X	X	X	X
	Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate. P.1.D.	X	X	X	X	X	X
	Create and use representations to organize, record, and communicate mathematical ideas. P.1.E.	X	X	X	X	X	X
	Analyze mathematical relationships to connect and communicate mathematical ideas. P.1.F.	X	X	X	X	X	X
	Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. P.1.G.	X	X	X	X	X	X
The student uses the process standards in mathematics to: <ul style="list-style-type: none"> • explore, describe, and analyze the attributes of functions. • make connections between multiple representations of functions. • algebraically construct new functions. • analyze and use functions to model real-world problems. The student is expected to:							
Functions	Six Weeks:	1	2	3	4	5	6
	Use the composition of two functions to model and solve real-world problems. P.2.A				X		
	Demonstrate that function composition is not always commutative. P.2.B				X		
	Represent a given function as a composite function of two or more functions. P.2.C				X		
	Describe symmetry of graphs of even and odd functions. P.2.D					X	
	Determine an inverse function, when it exists, for a given function over its domain or a subset of its domain and represent the inverse using multiple representations. P.2.E					X	
	Graph exponential, logarithmic, rational, polynomial, power, trigonometric, inverse trigonometric and piecewise defined functions, including step functions. P.2.F	X			X	X	X

	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		X		X	X	X					
	Graph $\arcsin(x)$ and $\arccos(x)$ and describe the limitations on the domain. P.2.H	X										
	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	X			X	X	X					
	Analyze and describe end behavior of functions, including exponential, logarithmic, rational, polynomial, and power functions using infinity notation to communicate this characteristic in mathematical and real-world problems. P.2.J				X	X	X					
	Analyze characteristics of rational functions and the behavior of the function around the asymptotes, including horizontal, vertical, and oblique asymptotes. P.2.K							X				
	Determine various types of discontinuities in the interval $(-\infty, \infty)$ as they relate to functions such as rational and piecewise defined functions and explore the limitations of the graphing calculator as it relates to the behavior of the function around discontinuities. P.2.L					X	X					
	Describe the left-sided behavior and the right-sided behavior of the graph of a function around discontinuities. P.2.M							X				
	Analyze situations modeled by functions, including exponential, logarithmic, rational, polynomial, and power functions, to solve real-world problems such as problems involving growth and decay and optimization. P.2.N				X	X	X					
	Develop and use a sinusoidal function that models a situation in mathematical and real-world problems. P.2.O	X		X								
	Determine the values of the trigonometric functions at the special angles and relate them in mathematical and real-world problems. P.2.P	X										
Relations and Geometric Reasoning	The student uses the process standards in mathematics to: <ul style="list-style-type: none"> model and make connections between algebraic and geometric relations. The student is expected to:											
	Six Weeks:						1	2	3	4	5	6
	Graph a set of parametric equations. P.3.A											
	Convert parametric equations into rectangular relations and convert rectangular relations into parametric equations. P.3.B											
	Use parametric equations to model and solve mathematical and real-world problems. P.3.C											
	Graph points in the polar coordinate system and convert between rectangular coordinates and polar coordinates P.3.D											

Algebraic Reasoning	The student uses the process standards in mathematics to: <ul style="list-style-type: none"> evaluate expressions, describe patterns, formulate models, and solve equations and inequalities using properties, procedures, or algorithms. The student is expected to:											
		Six Weeks:					1	2	3	4	5	6
	Evaluate finite sums and geometric series when possible written in sigma notation. P.5.A											X
	Represent arithmetic sequences and geometric sequences using recursive formulas. P.5.B											X
	Calculate the nth term and the nth partial sum of an arithmetic series in mathematical and real-world problems P.5.C											X
	Represent arithmetic series and geometric series using sigma notation. P.5.D											X
	Calculate the nth term of a geometric series, the nth partial sum of a geometric series, and sum of an infinite geometric series when it exists. P.5.E											X
	Apply Binomial Theorem for the expansion of $(a+b)^n$ in powers of a and b for a positive integer n, where a and b are any numbers. P.5.F											X
	Use the properties of logarithms to evaluate or transform logarithmic expressions. P.5.G								X			
	Generate and solve logarithmic equations in mathematical and real-world problems. P.5.H								X			
	Generate and solve exponential equations in mathematical and real-world problems. P.5.I								X			
	Solve polynomial equations with real coefficients by applying a variety of techniques such as factoring, graphical methods, or technology in mathematical and real-world problems. P.5.J								X			
	Solve polynomial inequalities with real coefficients by applying a variety of techniques such as factoring, graphical methods, or technology and write the solution set of the polynomial inequality in interval notation in mathematical and real-world problems. P.5.K								X			
	Solve rational inequalities with real coefficients by applying a variety of techniques such as factoring, graphical methods, or technology and write the solution set of the rational inequality in interval notation in mathematical and real-world problems. P.5.L								X			
Use trigonometric identities such as reciprocal, quotient, Pythagorean, cofunctions, even/odd, and sum and difference identities for cosine and sine to simplify trigonometric expressions. P.5.M								X				
Generate and solve trigonometric equations in mathematical and real-world problems. P.5.N	X			X								