

Pre-Calculus

Year at a Glance

Pre-Calculus	Duration	Assessed Standards	Big Ideas	Essential Questions	End of Unit Assessment
Unit 1: Visual Representations of Functions	9 days	HSF.IF.4 HSF.BF.3 HSF.IF.2 HSF.IF.7 HSA.REI.7 HSF.TF.2 HSF.TF.5 HSS.ID.6	<ul style="list-style-type: none"> Given certain visual characteristics, such as continuity, number of turns, rates of change, etc. one can identify the family to which a function belongs. Graph the sine and cosine functions given the understanding of the values of the unit circle. 	<ul style="list-style-type: none"> How does the modeling of a function allow for the exploration, comparison, and prediction? 	<ul style="list-style-type: none"> Department-generated Unit Assessment
Unit 2: Algebraic Representations of Functions	10 days	HSA.REI.3 HSA.REI.4 HSA.REI.5 HSA.REI.6 HSA.REI.7 HSF.IF.9 HSF.BF.4 HSF.BF.5 HSF.LE.1	<ul style="list-style-type: none"> Identify the family to which a function belongs given certain algebraic characteristics, such as parity and sign of coefficients, etc. Solve equations and systems of equations using a variety of methods, such as using linear methods, factoring, completing the square, the quadratic formula, inverse functions, and graphing. Graph and analyze linear, quadratic, and absolute value functions and their inverses using various methods and characteristics, such as intercepts, zeroes, degree, leading coefficient, etc. Model exponential growth and decay. Relate all algebraic models back to graphical models from Unit 1. 	<ul style="list-style-type: none"> How do you identify and model a functional relationship algebraically, graphically, numerically, and verbally? How does the modeling of a function allow for the exploration, comparison, and prediction? 	<ul style="list-style-type: none"> Department-generated Unit Assessment
Unit 3: Advanced Functions and Trigonometry	19 days	HSA.APR.2 HSA.APR.6 HSA.REI.2 HSF.IF.7 HSF.TF.2 HSF.TF.7 HSG.SRT.8	<ul style="list-style-type: none"> Graph and analyze polynomial functions using various methods and characteristics such as parity and sign of leading coefficient, degree of the function, and the zeroes of the function (and their respective multiplicities). Graph and analyze radical and rational functions using various methods and characteristics, such as identifying asymptotes, points of discontinuity, and end behavior. Analyze basic trigonometric functions using various characteristics, such as amplitude, period, phase shift, and vertical shift. 	<ul style="list-style-type: none"> How do you identify and model a functional relationship algebraically, graphically, numerically, and verbally? How does the modeling of a function allow for the exploration, comparison, and prediction? 	<ul style="list-style-type: none"> Department-generated Unit Assessment

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Unit 4: Advanced Trigonometry	18 days	HSF.BF.1 HSF.BF.3 HSF.IF.7 HSF.TF.6 HSF.TF.7 HSF.TF.8 HSF.TF.9	<ul style="list-style-type: none"> Analyze advanced trigonometric functions using various characteristics, such as amplitude, period, phase shift, and vertical shift. Solve trigonometric equations over a defined interval using various methods, including the use of linear methods, the unit circle, factoring, and identities. 	<ul style="list-style-type: none"> How do I analyze functions with periodicity and how can I use them to model periodic phenomenon? How can math fluency help to simplify/solve complex math expressions/equations? 	<ul style="list-style-type: none"> Department-generated Unit Assessment
Unit 5: Applications of Trigonometry	14 days	HSG.SRT.11 HSN.VM.1 HSN.VM.2 HSN.VM.4 HSN.CN.4	<ul style="list-style-type: none"> Solve oblique triangles using the Law of Sines and Law of Cosines. Model and explain phenomena using applications of trigonometry, including vectors, parametric functions, and polar functions. 	<ul style="list-style-type: none"> How can magnitude and direction be used to model real world situations. How can we represent functions and non-standard relations in equivalent forms? 	<ul style="list-style-type: none"> Department-generated Unit Assessment
Unit 6: Further Topics in Pre-Calculus	10 days	HSG.GMD.4 HSG.GPE.2 HSG.GPE.3 HSF.BF.2 HSA.APR.5 HSN.VM.8 HSN.VM.10	<ul style="list-style-type: none"> Decompose partial fractions to prepare for advanced work leading to calculus. Explain and model phenomena using the cross sections of a cone. Write and analyze sequences and series. Expand binomials of degree n using the binomial expansion formula. Analyze limits of a function using graphs. Analyze and operate on matrices. 	<ul style="list-style-type: none"> How can we use equations to represent relations that are not functions? How can patterns math fluency help to simplify/solve complex math expressions/equations? 	<ul style="list-style-type: none"> Department-generated Unit Assessment