

Northampton Area School District

“Year at a Glance” Honors Pre-Calculus

Board Approval Date: August 26, 2019

Textbook/Basal Resource: Pre-Calculus 9e / Ron Larson



**NORTHAMPTON AREA
SCHOOL DISTRICT**

Learn, Listen, and Lead

Common Units of Study with Sample Lesson Topics	Textbook Chapter(s)	Estimated % of Course Time	Estimated Time	Big Idea (s)	PA Academic Standard(s)
Unit 1: Functions and their graphs <ul style="list-style-type: none"> Algebra and functions, implicit and explicit functions, domain and range, critical points, extrema, points of inflection, increasing and decreasing intervals, end behavior, intro to limits at infinity, continuity, average rate of change, and piecewise functions 	<p style="text-align: center;">1 [1.3, 1.4, 1.5]</p>	<p style="text-align: center;">10 %</p>	<p style="text-align: center;">18 days</p>	Analyze the graphs of functions. Determine the domain & range. Determine intervals on which functions are increasing or decreasing. Determine relative maximum and relative minimum values.	CC.2.2.HS.C.2 CC.2.2.HS.C.4 CC.2.2.HS.D.4
Unit 2: Polynomial and Rational Functions <ul style="list-style-type: none"> Power functions with negative and rational exponents, factoring review, dividing polynomials using long and synthetic division, graphing rational functions, vertical/horizontal/slant asymptotes, missing points 	<p style="text-align: center;">2</p>	<p style="text-align: center;">12.2 %</p>	<p style="text-align: center;">22 days</p>	Use long division to divide polynomials. Use synthetic division to divide polynomials by binomials. Find vertical, horizontal and slant asymptotes of rational functions.	CC.2.1.HS.F.1 CC.2.2.HS.D.4 CC.2.2.HS.D.6 CC.2.2.HS.D.3
Unit 3: Trigonometric Functions <ul style="list-style-type: none"> Angles in standard form, degrees, radians decimal degrees, degrees, minutes, seconds, arc length, area of a sector, linear & angular speed Trigonometric functions and right triangles, the six trigonometric functions and special right triangles, trigonometric functions of any angle The Unit Circle and reference angles 	<p style="text-align: center;">4 [4.1, 4.2, 4.4]</p>	<p style="text-align: center;">20 %</p>	<p style="text-align: center;">36 days</p>	Use radian and degree measure. Evaluate trigonometric functions using the unit circle. Evaluate trigonometric functions of acute angles using right triangle trigonometry. Find reference angles.	CC.2.1.HS.C.7 CC.2.2.HS.C.8 CC.2.3.HS.A.7
Unit 4: Graphs of Trigonometric Functions <ul style="list-style-type: none"> Graphs of sine and cosine, transformations and applications, graphs of other trigonometric functions Inverse trigonometric functions Modelling using sine and cosine 	<p style="text-align: center;">4 [4.5,4.6,4.7,4.8]</p>	<p style="text-align: center;">22.2 %</p>	<p style="text-align: center;">40 days</p>	Sketch graphs of basic sine and cosine functions. Sketch translations of the graphs of sine and cosine functions. Sketch the graphs of tangent,	CC.2.2.HS.C.4 CC.2.2.HS.C.8 CC.2.1.HS.C.7

				cotangent, secant and cosecant functions. Evaluate and graph the inverse sine and cosine functions.	
Unit 5: Exponential Functions <ul style="list-style-type: none"> Exponential functions and their graphs, Logarithmic functions and their graphs, properties of logarithms, solving exponential and logarithmic equations 	3	6.6 %	12 days	Recognize and evaluate exponential functions with base a and base e. Recognize and evaluate logarithmic functions.	CC.2.2.HS.C.5 CC.2.2.HS.D.8 CC.2.2.HS.D.10
Unit 6: Analytic Trigonometry <ul style="list-style-type: none"> Fundamental Identities, verifying Trigonometric Identities, solving Trigonometric equations, sum and difference formulas, multiple angle formulas, product-to-sum formulas, Law of Sines, Law of Cosines Introduction to Conics - circles, parabolas, ellipses 	5 and 6	15.6 %	28 days	Use fundamental trigonometric identities to evaluate functions and simplify trigonometric expressions. Verify trigonometric identities. Use algebraic techniques to solve basic and quadratic type trigonometric equations. Use sum and difference formulas to evaluate trigonometric functions, verify identities and solve trigonometric equations. Solve triangles using the Law of Sines and the Law of Cosines. Find the area of oblique triangles.	CC.2.1.HS.C7 CC.2.2.HS.C.8 CC.2.2.HS.C.9 CC.2.2.HS.D.8 CC.2.2.HS.D.10 CC.2.3.HS.A.10
Unit 7: Limits and an Introduction to Calculus <ul style="list-style-type: none"> Introduction to limits (review), techniques for evaluating limits, the tangent line problem, limits at infinity (review), and infinite limits (review) 		13.4 %	24 days	Use limit notation to describe end behavior of a function. Evaluate limits at infinity. evaluate the limit of the difference quotient. Use the limit definition of the derivative to find the slope of the tangent line.	(no PA common core standards exist)

**You may add other columns if needed to make a more meaningful and thorough document for your particular course.*