Plano ISD Honors Precalculus Syllabus 2017-2018

1st semester (80 days)

1st Grading Period (42 days)	2nd Grading Period (38 days)
Non-Trigonometric Functions ❖ Evaluating and using function notation for advanced functions. ❖ Identifying attributes of all functions, such as domain and range, asymptotes, intercepts, extrema, end behavior, intervals of increasing/decreasing, and whether it is one-to-one. ❖ Determining odd and even functions graphically and algebraically. ❖ Graphing and writing equations of all non-trig parent functions and their transformations. + Describing the effects of the $\|f(x)\|$ and $f(\|x\|)$ transformation. ❖ Finding and utilizing quotients with long/synthetic division. ❖ Identifying an appropriate domain for a real-world situation. ❖ Rewriting absolute value functions as piecewise functions. ❖ Graphing and writing equations of polynomial and rational functions. ❖ Using the Remainder Theorem, Factor Theorem and Rational Zero (Root) Theorem to aid in graphing polynomial functions. ❖ Describing end behavior and asymptotic behavior using limit notation. + Using the Intermediate Value Theorem to prove that $f(c)$ is between $f(a)$ and $f(b)$. ***Non-Trigonometric Solving*** ❖ Solving polynomial equations. ❖ Using the properties to simplify/expand logarithmic expressions. ❖ Evaluating logarithmic and exponential expressions. ❖ Solving real-world problems involving exponential, logarithmic, polynomial, rational, and power (radical) functions. **End of grading period: October 20**	***Continue Non-Trigonometric Solving*** ❖ Using sign patterns to solve polynomial and rational inequalities. ❖ Solving polynomial and rational inequalities graphically. ❖ Creating a simplified function rule from the composition of two or more advanced functions. ❖ Decomposing a composite function. ❖ Finding the inverse of a function algebraically and graphically. ❖ Verifying functions are inverses if and only if their compositions are commutative. ❖ Describing the relationship between a function and its inverse in regards to domain, range and transformations. + Finding the domain of a composite function. ***Trigonometric Fundamentals*** ❖ Finding positive and negative radian measures of arc lengths. ❖ Converting angle measures between degrees and radians. ❖ Identifying coterminal and reference angles. ❖ Identifying trigonometric ratios in terms of x, y, and r. ❖ Calculating trig function values with and without a calculator. ❖ Graphing the trig functions and stating their critical attributes. + Transforming all six trigonometric functions ❖ Graphing sinusoidal functions, giving its critical attributes (amplitude, period, phase shift, etc.) and labeling significant points. ❖ Writing an equation of a sinusoidal function given a graph or specific attributes. ❖ Calculating angular and linear velocities. **End of grading period: December 20** **Semester Exams: December 15, 18 - 20**

2nd semester (97 days)

3rd Grading Period (45 days)

Continue Trigonometric Fundamentals

- ❖ Finding the value of inverse trig functions in radians.
- \+ Identifying the principal intervals for all six trigonometric inverse functions.
- ❖ Evaluating compositions of trigonometric functions and inverse trigonometric functions.
- ❖ Writing algebraic expressions from the composition of trigonometric functions and inverse trigonometric functions.
- \+ Graphing all inverse trig parent functions and transformations.
- ❖ Using trigonometric identities to simplify and evaluate expressions.
- ❖ Verifying trigonometric identities.

Trigonometric Solving and Applications

- ❖ Finding general solutions or solutions within a given interval.
- ❖ Finding exact solutions which involve special angles from the unit circle.
- ❖ Using a calculator to find approximate solutions only when necessary.
- ❖ Sketching an appropriate representation for the situation.
- ❖ Labeling the representations appropriately.
- ❖ Using trig identities to solve and verify equations.
- ❖ Using Law of Sines, and Law of Cosines to solve for missing sides and angles of triangles and other applications
- ❖ Using $A = \frac{1}{2}ab\sin(c)$ to find the area of triangles.

Conics, Parametrics, Vectors, and Polar

- ❖ Identifying conic sections from a double-napped cone and their locus definitions.
- ❖ Graphing ellipses, hyperbolas, parametric, and polar equations with and without technology.
- ❖ Finding the attributes of ellipses and hyperbolas.
- ❖ Writing parametric, conic, and polar equations to model situations.
- ❖ Converting between multiple representations.
- ❖ Performing vector operations.

End of grading period: March 9

4th Grading Period (52 days)

Continue Conics, Parametrics, Vectors, and Polar

- ❖ Finding the resultant vector algebraically and graphically.
- ❖ Finding the magnitude and direction of a vector.
- \+ Using dot product to determine if two vectors are orthogonal and to find the angle between two vectors.
- ❖ Representing objects in motion using parametric equations.
- ❖ Using parameter restrictions to determine domain and range.
- ❖ Using the calculator in parametric and polar mode.
- \+ Solving systems of polar equations algebraically.

Sequences and Series

- ❖ Writing recursive formulas for a given arithmetic or geometric sequence.
- ❖ Finding the sum of a finite arithmetic or geometric series.
- ❖ Finding the sum of an infinite geometric series.
- ❖ Writing arithmetic and geometric series using sigma notation.
- ❖ Expanding a binomial expression.

End of grading period: June 1

Semester Exams: May 30 – June 2