Plano ISD Precalculus Syllabus 2023-2024

1st semester (85 days)

1st Grading Period (42 days)	2nd Grading Period (43 days)
Sequences and Series ❖ Write recursive formulas for a given arithmetic or geometric sequence. ❖ Identify whether a sequence converges or diverges. ❖ Find the sum of a finite arithmetic or geometric series. ❖ Find the sum of an infinite geometric series, if it exists. ❖ Write arithmetic and geometric series using sigma notation. ❖ Expand a binomial expression. ❖ Find a specific term of a binomial expansion. ***Non-Trigonometric Functions*** ❖ Identify attributes of all non-trigonometric parent functions (and their transformations), such as domain and range, asymptotes, intercepts, extrema, end behavior, and intervals of increasing/decreasing. ❖ Determine odd and even functions graphically and algebraically. ❖ Graph and write equations of all non-trigonometric parent functions and their transformations. ❖ Describe the effects of the $\|f(x)\|$transformation. ❖ Write transformed non-trigonometric parent functions and piecewise-defined functions using function notation. ❖ Evaluate piecewise-defined functions. ❖ Rewrite absolute value functions as piecewise-defined functions. ❖ Use long/synthetic division to aid in graphing polynomial and rational functions. ❖ Use the Remainder Theorem, Factor Theorem and Rational Zero (Root) Theorem to aid in graphing polynomial functions. ❖ Identify extrema and intervals over which a polynomial is increasing or decreasing. ❖ Graph and write equations of polynomial and rational functions. ❖ Describe end behavior and asymptotic behavior using limit notation. **End of grading period: October 6**	***Continue Non-Trigonometric Functions*** ❖ Identify an appropriate domain for a real-world situation. ***Non-Trigonometric Solving*** ❖ Solve exponential, logarithmic, polynomial, rational, and power (radical) equations and determine the validity of the solution(s) in context. ❖ Solve real-world applications for exponential, logarithmic, and polynomial equations and determine the validity of the solution(s) in context. ❖ Use the properties of logarithms to evaluate or transform logarithmic expressions. ❖ Evaluate logarithmic and exponential expressions. ❖ Manipulate literal equations to isolate a different variable. ❖ Represent polynomial and rational functions with sign patterns. ❖ Solve polynomial and rational inequalities and generate solution(s) in context. ❖ Generate and evaluate composite functions. ❖ Model and solve real-world applications using composite functions. ❖ Decompose a composite function. ❖ Demonstrate that function composition is not always commutative. ❖ Write the inverse of a function when it exists. **End of grading period: December 21** **Semester Exams: December 18 - 21**

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2nd semester (89 days)

3rd Grading Period (41 days)	4th Grading Period (48 days)
Trigonometric Fundamentals ❖ Convert angle measures between degrees and radians. ❖ Identify radian and degree measures on the unit circle. ❖ Identify coterminal and reference angles. ❖ Calculate angular and linear velocities. ❖ Relate special angles (arc measures) to their coordinate pairs. ❖ Relate coordinate pairs of special angles to all six trigonometric ratios. ❖ Graph and identify the attributes of trigonometric parent functions. ❖ Graph and identify the attributes of transformed sine and cosine parent functions. ❖ Write an equation of a sine or cosine function given specific attributes or a graph. ❖ Model and solving real-world situations using sinusoidal functions. ❖ Identify the principal values (restrictions on domain) for sine, cosine, and tangent as they relate to the corresponding inverse functions. ❖ Evaluate and graphing inverse functions for sine, cosine, and tangent. ❖ Evaluate and writing an algebraic expression for compositions containing trigonometric functions and inverse trigonometric functions. ❖ Recognize trigonometric identities. ❖ Simplify trigonometric expressions using trigonometric identities. ❖ Evaluate trigonometric expressions using trigonometric identities. ❖ Verify the equality of two trigonometric expressions using trigonometric identities. ***Trigonometric Solving and Applications*** ❖ Solve trigonometric equations and determining the validity of the solution(s) in context. ❖ Differentiate between general solutions and solutions over specified intervals. **End of grading period: March 8**	***Continue Trigonometric Solving and Applications*** ❖ Solve oblique triangles using Law of Sines in context. ❖ Solve ambiguous case triangles in context. ❖ Solve oblique triangles using Law of Cosines in context. ❖ Calculate the area of any triangle. ***Conics, Parametric, Vectors, and Polar*** ❖ Identify conic sections from a double-napped cone and its locus definition. ❖ Graph and identify the attributes of ellipses and hyperbolas. ❖ Write the equation of an ellipse or a hyperbola given specific attributes or a graph. ❖ Graph parametric equations. ❖ Convert between rectangular and parametric forms of equations. ❖ Solve real-world applications involving projectile motion. ❖ Represent vectors geometrically and algebraically. ❖ Perform vector addition and scalar multiplication geometrically and algebraically in mathematical and real-world problems. ❖ Represent vectors using magnitude and direction, component form or as a linear combination. ❖ Use vectors to model situations involving magnitude and direction. ❖ Use dot product to determine if two vectors are orthogonal. ❖ Represent points using the polar coordinate system. ❖ Convert coordinates between polar and rectangular. ❖ Graph and identify attributes of polar equations. **End of grading period: May 24** **Semester Exams: May 21 - 24**