

MONROE COUNTY COMMUNITY SCHOOL CORPORATION
CURRICULUM GUIDE

PRE-CALCULUS

PROFICIENCY 1: THE LEARNER WILL DEMONSTRATE PROFICIENCY IN USING SCIENTIFIC CALCULATORS AND GRAPHING TECHNOLOGY

- 1.1 Graph functions and relations
- 1.2 Analyze functions (zeros, domain, range, asymptotes, etc.)
- 1.3 Solve equations
- 1.4 Evaluate trigonometric and inverse trigonometric functions
- 1.5 Verify trigonometric identities
- 1.6 Convert radians/degrees

PROFICIENCY 2: THE LEARNER WILL DEVELOP AN UNDERSTANDING OF POLYNOMIAL, RATIONAL, AND ALGEBRAIC FUNCTIONS

- 2.1 Construct functions to model and solve real world problems
- 2.2 Find domain, range, intercepts, asymptotes, and points of discontinuity for polynomial, rational, and algebraic functions
- 2.3 Combine functions by composition
- 2.4 Define, determine, and verify inverse functions for polynomial, rational, and algebraic functions
- 2.5 Identify odd and even functions and implications for their graphs
- 2.6 Graph polynomial, rational, and algebraic functions and analyze graphs of functions
- 2.7 Make connections between table, equation, and graphical representations of polynomial, rational, and algebraic functions
- 2.8 Analyze functions defined piecewise
- 2.9 Apply translations and reflections to polynomial, rational, and algebraic functions
- 2.10 Make connections among a problem situation, its model as a function in symbolic form, and the graph of that function

PROFICIENCY 3: THE LEARNER WILL BROADEN HIS/HER ABILITY TO SOLVE AND INTERPRET EQUATIONS

- 3.1 Solve real world problems involving applications of equations
- 3.2 Put equations of circles, parabolas, ellipses, and hyperbolas in standard form
- 3.3 Analyze and graph conics
- 3.4 Define and use parametric equations

PROFICIENCY 4: THE LEARNER WILL DEVELOP AN UNDERSTANDING OF LOGARITHMIC AND EXPONENTIAL FUNCTIONS

- 4.1 Solve real world problems involving applications of exponential and logarithmic functions
- 4.2 Find domain, range, intercepts, and asymptotes of logarithmic and exponential functions
- 4.3 Define, determine, and verify inverse functions for logarithmic and exponential functions
- 4.4 Graph logarithmic and exponential functions and analyze graphs of functions, using a variety of bases
- 4.5 Solve logarithmic and exponential equations and inequalities

PROFICIENCY 5: THE LEARNER WILL APPLY TRIGONOMETRY TO PROBLEM SITUATIONS INVOLVING TRIANGLES

- 5.1 Solve real world problems involving right and oblique triangles
- 5.2 Define trigonometric functions using right triangles
- 5.3 Apply the laws of sines and cosines to the solution of application problems
- 5.4 Define vectors and use in solving real world problems

PROFICIENCY 6: THE LEARNER WILL DEVELOP AN UNDERSTANDING OF TRIGONOMETRIC FUNCTIONS

- 6.1 Solve real world problems involving applications of trigonometric functions
- 6.2 Develop the relationship between degree and radian measures
- 6.3 Define trigonometric functions using the unit circle
- 6.4 Learn exact sine, cosine, and tangent values for multiples of π , $\pi/2$, $\pi/3$, $\pi/4$, $\pi/6$ and 0

- 6.5 Find domain, range, intercepts, periods, amplitudes, and asymptotes of the trigonometric functions
- 6.6 Identify odd and even functions and the implications for their graphs
- 6.7 Graph trigonometric functions and analyze graphs of trigonometric functions
- 6.8 Define and evaluate inverse functions
- 6.9 Analyze and graph translations of trigonometric functions
- 6.10 Make connections among the right triangle ratios, trigonometric functions, and the circular functions

PROFICIENCY 7: THE LEARNER WILL SOLVE TRIGONOMETRIC EQUATIONS AND VERIFY TRIGONOMETRIC IDENTITIES

- 7.1 Solve real world problems involving application of trigonometric equations
- 7.2 Apply the fundamental trigonometric identities
- 7.3 Use the fundamental trigonometric identities to verify simple identities
- 7.4 Use graphing technology for solving trigonometric equations

PROFICIENCY 8: THE LEARNER WILL UNDERSTAND THE CONNECTIONS BETWEEN TRIGONOMETRIC FUNCTIONS AND POLAR COORDINATES AND COMPLEX NUMBERS

- 8.1 Define polar coordinates and relate polar to Cartesian coordinates
- 8.2 Graph equations in the polar coordinate plane
- 8.3 Define complex numbers and convert to trigonometric form
- 8.4 State and use DeMoivre's Theorem

PROFICIENCY 9: THE LEARNER WILL DEVELOP AN UNDERSTANDING OF SEQUENCES AND SERIES

- 9.1 Solve real world problems involving applications of sequences and series
- 9.2 Define arithmetic and geometric sequences and series
- 9.3 Use summation notation
- 9.4 Find specific terms of arithmetic and geometric series

- 9.5 Find partial sums of arithmetic and geometric series
- 9.6 Find the sum of infinite geometric series
- 9.7 Use recursion to describe a sequence
- 9.8 Define and use the mathematical induction method of proof

PROFICIENCY 10: THE LEARNER WILL DEMONSTRATE AN UNDERSTANDING OF COUNTING PRINCIPLES AND PROBABILITY

- 10.1 Apply the fundamental counting principle, permutations, and combinations to real world problems
- 10.2 Use experimental or theoretical probability to represent and solve problems