E^3 STEM ADADEMY
Engage-Enhance-Excel

Precalculus- Course Outline

Unit 1: Functions

- Analyzing graphs of functions and relations
- Continuity, end behavior, and limits
- Extrema and average rates of change
- Parent functions and transformations
- Function operations and composition of functions
- Inverse relations and functions

Unit 2: Power, Polynomial, and Rational Functions

- Power and radical functions
- Polynomial functions
- Remainder and factor theorems
- Zeros of polynomial functions
- Rational functions

Unit 3: Exponential and Logarithmic Functions

- Exponential functions
- Logarithmic functions
- Properties of logarithms
- Exponential and Logarithmic equations
- Modeling with non-linear regression

Unit 4: Sequences and Series

- Definition Sequences
- Definition Series
- Sum of a Series (Sigma Notation)
- Arithmetic Sequences and Partial Sums
- Geometric Sequences and Series
- Binomial Theorem

Unit 5: Introduction to Trigonometric Functions

- Right triangle trigonometry
- Degrees and radians
- Trigonometric functions on the unit circle
- Graphing sine and cosine functions
- Graphing other trigonometric functions
- Inverse trig functions
- Law of sines and cosines

Unit 6: Trigonometric Identities and Equations

- Trig Identities
- Verifying trig identities
- Solving trig equations
- Sum and difference identities
- Multiple-Angle and product-to-sum identities

Unit 7: Conic Sections and Parametric Equations

- Parabolas
- Ellipses
- Circles
- Hyperbolas
- Parametric equations

Unit 8: Vectors

- Vectors
- Dot products and projections
- Polar Coordinates and Complex Numbers
- Polar Coordinates and graphs