Precalculus is a comprehensive course that weaves together previous study of algebra, geometry, and functions into a preparatory course for calculus. The course focuses on the mastery of critical skills and exposure to new skills necessary for success in subsequent math courses. The first semester includes linear, quadratic, exponential, logarithmic, radical, polynomial, and rational functions; systems of equations; and conic sections. The second semester covers trigonometric ratios and functions; inverse trigonometric functions; applications of trigonometry, including vectors and laws of cosine and sine; polar functions and notation; and arithmetic of complex numbers.

Within each Precalculus lesson, students are supplied with a post-study Checkup activity that provides them the opportunity to hone their computational skills in a low-stakes problem set before moving on to formal assessment. Additionally, connections are made throughout the Precalculus course to calculus, art, history, and a variety of other fields related to mathematics.

The course is built to the National Council of Teachers of Mathematics (NCTM) standards and is aligned with state standards.

Length: Two semesters

UNIT 1: FUNCTIONS
- Lesson 1: What Is a Function?
- Lesson 2: Graphing Functions
- Lesson 3: Linear Functions
- Lesson 4: Arithmetic Sequences and Series
- Lesson 5: Linear Equations and Inequalities
- Lesson 6: Linear Systems
- Lesson 7: Arithmetic of Functions
- Lesson 8: Functions Wrap-Up
- Lesson 9: Diagnostic

UNIT 2: QUADRATIC FUNCTIONS
- Lesson 1: Forms of Quadratic Functions
- Lesson 2: Graphing Quadratic Functions
- Lesson 3: Transformations
- Lesson 4: Solving Quadratic Equations
- Lesson 5: Applications of Quadratic Functions
- Lesson 6: Quadratic Functions Wrap-Up
- Lesson 7: Diagnostic

UNIT 3: POLYNOMIAL AND RATIONAL FUNCTIONS
- Lesson 1: Polynomial Expressions
- Lesson 2: Dividing Polynomials
- Lesson 3: Solving Polynomial Equations
- Lesson 4: Graphing Polynomial Functions
- Lesson 5: Rational Functions
- Lesson 6: Polynomial and Rational Functions Wrap-Up
- Lesson 7: Diagnostic

UNIT 4: EXPONENTIAL AND LOGARITHMIC FUNCTIONS
- Lesson 1: Exponents and Radicals
- Lesson 2: Exponential Functions
Lesson 3: Geometric Sequences
Lesson 4: Introduction to Logarithms
Lesson 5: Graphs of Logarithmic Functions
Lesson 6: Applications of Logarithms
Lesson 7: Exponential and Logarithmic Functions Wrap-Up
Lesson 8: Diagnostic

UNIT 5: CONIC SECTIONS
Lesson 1: Introduction to Conic Sections
Lesson 2: Ellipses
Lesson 3: Hyperbolas
Lesson 4: Parabolas
Lesson 5: Systems of Conic Sections
Lesson 6: Conic Sections Wrap-Up
Lesson 7: Diagnostic

UNIT 6: PRECALCULUS SEMESTER 1 REVIEW AND EXAM
Lesson 1: Preparing for the Semester Exam

UNIT 7: INTRODUCTION TO TRIGONOMETRY
Lesson 1: Right Triangles
Lesson 2: Angles and Radians
Lesson 3: Trigonometric Ratios and the Unit Circle
Lesson 4: Introduction to Trigonometry Wrap-Up
Lesson 5: Diagnostic

UNIT 8: TRIGONOMETRIC FUNCTIONS
Lesson 1: Graphs of Sine and Cosine
Lesson 2: Graphs of Other Functions
Lesson 3: Simple Transformations of Sinusoids
Lesson 4: General Transformations of Periodic Graphs
Lesson 5: Trigonometric Functions Wrap-Up
Lesson 6: Diagnostic

UNIT 9: WORKING WITH TRIGONOMETRIC FUNCTIONS
Lesson 1: Inverse Trigonometric Functions
Lesson 2: Solving Trigonometric Equations
Lesson 3: Modeling Simple Harmonic Motion
Lesson 4: Working with Trigonometric Functions Wrap-Up
Lesson 5: Diagnostic

UNIT 10: TRIGONOMETRIC IDENTITIES
Lesson 1: Identities and Proof
Lesson 2: Trigonometric Identities
Lesson 3: Applications of Identities
Lesson 4: Trigonometric Identities Wrap-Up
Lesson 5: Diagnostic

UNIT 11: APPLICATIONS OF TRIGONOMETRY
Lesson 1: Law of Cosines
Lesson 2: Law of Sines
Lesson 3: Vectors
Lesson 4: Applications of Trigonometry Wrap-Up
Lesson 5: Diagnostic

UNIT 12: COMPLEX NUMBERS
Lesson 1: Polar Coordinates
Lesson 2: Graphs of Polar Functions
Lesson 3: Polar Form of Complex Numbers
Lesson 4: Arithmetic of Complex Numbers
Lesson 5: Powers and Roots of Complex Numbers
Lesson 6: Complex Numbers Wrap-Up
Lesson 7: Diagnostic

UNIT 13: PRECALCULUS SEMESTER 2 REVIEW AND EXAM
Lesson 1: Preparing for the Semester Exam