

## Comprehensive Pre-Calculus/Trigonometry / Part A

**COURSE DESCRIPTION:** Pre-calculus 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. Topics include linear, quadratic, exponential, logarithmic, radical, polynomial, and rational functions; systems of equations; and conic sections in the first semester. 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.

Cross-curricular connections are made throughout the course to calculus, art, history, and a variety of other fields related to mathematics.

**PREREQUISITES:** Geometry and MTH303: Algebra II (or equivalents)

**COURSE LENGTH:** One Semester

**REQUIRED TEXT:** None

**MATERIALS LIST:** Texas Instruments T1-84 Plus graphing calculator is recommended.

### **COURSE OUTLINE:**

#### **Unit 1: Functions**

- What is a Function?
- Graphing Functions
- Linear Functions
- Arithmetic Sequences and Series
- Linear Equations and Inequalities
- Linear Systems
- Arithmetic of Functions

#### **Unit 2: Quadratic Functions**

- Forms of Quadratic Functions
- Graphing Quadratic Functions
- Transformations

- Solving Quadratic Equations
- Applications of Quadratic Functions

**Unit 3: Polynomial and Rational Functions**

- Polynomial Expressions
- Dividing Polynomials
- Solving Polynomial Equations
- Graphing Polynomial Functions
- Rational Functions

**Unit 4: Exponential and Logarithmic Functions**

- Exponents and Radicals
- Exponential Functions
- Geometric Sequences
- Introduction to Logarithms
- Graphs of Logarithmic Functions
- Applications of Logarithms

**Unit 5: Conic Sections**

- Introduction to Conic Sections
- Ellipse
- Hyperbolas
- Parabolas
- Systems of Conic Sections

**Unit 6: Semester Review**

- Review
- Exam