

MATH 40

Algebra, Trigonometry, and Analytic Geometry (5) Concepts of algebra; equations; inequalities; functions; graphs; polynomial and rational functions; exponential and logarithmic functions; trigonometry; analytic geometry; complex numbers.

Prerequisite: satisfactory performance on the mathematics proficiency examination

TOPICS

BASIC ALGEBRAIC CONCEPTS

The Real Number Systems
Order Properties and Absolute Value
The Arithmetic of Rational Numbers
Exponents and Radicals
The Arithmetic of Polynomials
Factoring
Rational Fractions and Fractional Expressions

EQUATIONS AND INEQUALITIES OF THE FIRST AND SECOND DEGREE

Linear Equations
Quadratic Equations
Completing the Square and the Quadratic Formula
Complex Numbers
Equations That Are Convertible to Linear or Quadratic Forms
Linear Inequalities
Inequalities and Absolute Value
Quadratic and Other Nonlinear Inequalities
Applications

FUNCTIONS AND GRAPHS

The Cartesian Coordinate System and Graphs of Equations
The Function Concept
Graphs of Functions
Combinations of Functions
One-to-One Functions and Inverses

LINEAR AND QUADRATIC FUNCTIONS

Equations of Lines
Properties of Lines and Line Segments
Linear Functions
Quadratic Functions
Parabolas with Horizontal Axes; Circles

HIGHER-DEGREE POLYNOMIAL AND RATIONAL FUNCTIONS

The Remainder Theorem and the Factor Theorem
Synthetic Division
The Fundamental Theorem of Algebra and Its Corollaries
Rational and Irrational Roots
Graphing Polynomial Functions
Rational Functions

EXPONENTIAL AND LOGARITHMIC FUNCTIONS

The Exponential Function
Inverses of Exponential Functions
Properties of Logarithms
Applications of Exponential and Logarithmic Functions

THE TRIGONOMETRIC FUNCTIONS

Measurement of Angles
Special Angles
Trigonometric Functions of Angles
Trigonometric Functions of Real Numbers
Trigonometric Identities
The Addition of Formulas for Sine and Cosine
Double-Angle, Half-Angle, and Reduction Formulas
Trigonometric Equations
Graphs of the Trigonometric Functions
The Inverse Trigonometric Functions

THE SOLUTION OF TRIANGLES

Right Triangle Trigonometry
The Law of Sines
The Law of Cosines
Areas of Triangles

SYSTEMS OF EQUATIONS AND INEQUALITIES

Linear Systems
Nonlinear Systems

THE CONIC SECTIONS

The Parabola
The Ellipse
The Hyperbola