

Mathematics 8A: Introduction to College Mathematics

A study of functions and their graphs, with application to the sciences (including linear and polynomial functions, zeroes, inverse functions exponential, logarithmic and trigonometric functions and their inverses); counting (including elementary probability); and arithmetic/geometric progression emphasizing induction and critical thinking.

Prerequisites and Algebraic Notation

- P.1 Real Numbers and Their Properties
- P.2 Integral Exponents and Scientific Notation
- P.3 Rational Exponents and Radicals
- P.4 Complex Numbers
- P.5 Polynomials
- P.6 Factoring Polynomials
- P.7 Rational Expressions

Equations, Inequalities, and Modeling

- 1.1 Equations in One Variable
- 1.2 Constructing Models to Solve Problems
- 1.3 Equations and Graphs in Two Variables
- 1.4 Linear Equations in Two Variables
- 1.6 Quadratic Equations
- 1.7 Linear and Absolute Value Inequalities

Functions and Graphs

- 2.1 Functions
- 2.2 Graphs of Relations and Functions
- 2.3 Families of Functions, Transformations, and Symmetry
- 2.4 Operations with Functions
- 2.5 Inverse Functions
- 2.6 Constructing Functions with Variation

Polynomial and Rational Functions

- 3.1 Quadratic Functions and Inequalities
- 3.2 Zeros of Polynomial Functions
- 3.3 Theory of Equations
- 3.5 Graphs of Polynomial Functions
- 3.6 Rational Functions and Inequalities

Exponential and Logarithmic Functions

- 4.1 Exponential Functions and Their Applications
- 4.2 Logarithmic Functions and Their Applications
- 4.3 Rules of Logarithms

The Trigonometric Functions

- 5.1 Angles and Their Measurements
- 5.2 The Sine and Cosine Functions
- 5.3 The Graphs of the Sine and Cosine Functions

- 5.4 The Other Trigonometric Functions and Their Graphs
- 5.5 The Inverse Trigonometric Functions

Trigonometric Identities and Conditional Equations

- 6.1 Basic Identities
- 6.2 Verifying Identities

Applications of Trigonometry

- 7.1 Law of Sines
- 7.2 Law of Cosines

Systems of Equations and Inequalities

- 8.1 Systems of Linear Equations in Two Variables
- 8.2 Systems of Linear Equations in Three Variables
- 8.5 Inequalities and systems of Inequalities in Two Variables

The Conic Sections

- 10.1 The Parabola
- 10.2 The Ellipse and the Circle
- 10.3 The Hyperbola

Sequences, Series, and Probability

- 11.1 Arithmetic Sequences
- 11.2 Arithmetic Series
- 11.3 Geometric Sequences and Series
- 11.4 Counting and Permutations
- 11.5 Combinations and the Binomial Theorem
- 11.6 Elementary Probability
- 11.7 Mathematical Induction