## Functions

- Continuity
- Extrema, intervals of increase and decrease
- Power functions
- Average rates of change
- Transformations of graphs
- Piecewise functions
- Operations
- Inverses

Power, Polynomial, and Rational Functions

- Graphs, real zeros, and end behavior
- Dividing polynomial functions
- The Remainder Theorem and bounds of real zeros
- Writing polynomial functions and conjugate roots
- Complex zeros \& Fundamental Theorem of Algebra
- Graphs of rational functions
- Rational equations
- Polynomial inequalities
- Rational inequalities

Exponential and Logarithmic Expressions

- Graphing exponential functions
- Exponential equations not requiring logarithms
- Exponents and logarithms
- Evaluating logarithms
- Logarithms and exponents as inverses
- Properties of logarithms
- Writing logs in terms of others
- Exponential equations requiring logarithms
- Logarithmic equations, simple
- Logarithmic equations, hard
- Graphing logarithmic functions


## - Compound interest

Trigonometry

- Angles and angle measure
- Right triangle trigonometry
- Trig functions of any angle
- Graphing trig functions
- Simple trig equations
- Inverse trig functions
- Fundamental identities
- Equations with factoring and fundamental identities
- Sum and Difference Identities
- Multiple-Angle Identities
- Product-to-Sum Identities
- Equations and Multiple-Angle Identities
- The Law of Sines
- The Law of Cosines

Parametric Equations

- Parametric equations
- Projectile motion

Polar Coordinates

- Polar coordinates
- Graphs of polar equations
- Polar and rectangular forms of equations
- Polar forms of conic section
- Complex numbers and polar form


## Vectors

- Vector basics
- Vector operations
- Dot products

Three-Dimensional Vectors

- 3 D vector basics
- 3D vector operations
- Vector cross products

Matrices and Systems

- Matrix operations
- Matrix inverses and determinants
- Matrix equations
- Cramer's Rule
- Multivariable linear systems and row operations
- Partial fraction decomposition

Conic Sections

- Parabolas
- Circles
- Ellipses
- Hyperbolas
- Rotations of conic sections

Discrete Mathematics

- Sample spaces \& Fundamental Counting Principle
- Permutations
- Combinations
- Permutations vs combinations
- The Binomial Theorem
- Mathematical induction

Probability

- Independent and dependent events
- Mutually exclusive events
- Probability with combinatorics
- Probability with combinatorics - binomial

Sequences and Series

- General sequences and series
- Arithmetic sequences and series
- Geometric sequences and series
- Power series

Introduction to Calculus

- Limits by direct evaluation
- Limits at kinks and jumps
- Limits at removable discontinuities
- Limits at essential discontinuities
- Limits at infinity
- Definition of the derivative
- Instantaneous rates of change
- Power rule for differentiation
- Motion along a line
- Approximating area under a curve
- Area under a curve by limit of sums
- Indefinite integrals

