

MATH 140A

(GQ) **Calculus, Analytic Geometry, Algebra, and Trigonometry (6)** Review of algebra and trigonometry; analytic geometry; functions; limits; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, 140A, and 140B.

Prerequisite: 3-4 years of HS math including trigonometry with satisfactory performance on the FTCAP exam, or satisfactory performance on the algebra and trigonometry math proficiency examination.

Topics

Precalculus

Rational Expressions

Quadratics

Solving Equations

Abs Value, Rational, Polynomial Ineq

Lines

Functions, Basic Graphs, Domain/Range

Transformations, Piecewise Functions

Limits

Tangent & Velocity Problems

Limit of a function

Calculating limits using properties of limits and/or limit laws

Continuity(including the Intermediate Value Theorem)

Derivatives

Limit definition of the derivative(including the definition and concept of differentiability and the derivative as a function)

Differentiation Formulas

Rates of Change in the Natural & Social Sciences

Derivatives of Trigonometric Functions

Chain Rule

Implicit Differentiation

Higher Order Derivatives

Related rate problems

Linear approximations and Differentials

Applications of Differentiation

Maximum and Minimum Values: Local(relative) and global(absolute) extrema and the Extreme Value Theorem

Mean Value Theorem

Local extrema and inflection points

Asymptotes and limits at infinity

Curve sketching

Optimization Problems

Integration

Antiderivatives

Limit definition of area under a graph

Definite Integral

Fundamental Theorem of Calculus

Substitution method of integration

Applications of Integration

Area Enclosed By Two Graphs

Volumes of rotation-Disk method

Volumes of rotation-shell method