



Bow High School - Course Overview

Course Title: AP Calculus I
Department: Mathematics
Credits: 1
Grades: 11-12

Course Description:

- Teacher recommendation is suggested for this course. Summer work is required. In this course we will build conceptual understanding of topics by combining graphical, numerical, and algebraic viewpoints. This strategy will permeate all areas of study so that you will gain a deep and useful understanding of the topics of differential and integral calculus. The spectrum of applications will be broad, ranging from the life & social sciences to business & economics to science & engineering. Topics will include limits and continuity; derivatives of algebraic, trigonometric, and transcendental functions; applications of the first and second derivative; integrals of algebraic, trigonometric, and transcendental functions; applications of integrals; and separable differential equations. Students are expected to successfully conquer the AP Calculus AB exam in May. Students should own a TI-84 Plus graphing calculator.

School Competencies:

- Readiness (Awareness - Foundational)
- Applied Mathematical Modeling (Problem Solving & Analysis - Foundational)
- Critical Thinking (Problem Solving & Analysis - Foundational)
- Interpretation (Problem Solving & Analysis - Foundational)
- Logical Processing (Problem Solving & Analysis - Foundational)
- Viable Technological Usage (Problem Solving & Analysis - Foundational)
- Analytical Application (Problem Solving & Analysis - Advanced)
- Cognitive Flexibility (Problem Solving & Analysis - Advanced)
- Innovation (Problem Solving & Analysis - Advanced)
- Multi-Disciplinary Technological and Scientific Understanding (Problem Solving & Analysis - Advanced)
- Technical Design (Problem Solving & Analysis - Advanced)
- Technological & Science Understanding (Problem Solving & Analysis - Advanced)

Course Competencies:

- Given a mathematical scenario, determine the appropriate property of limits that should be applied, determine whether the limit exists and if it does not, describe the conditions that make it non-existent



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- Ascertain a derivative of a function and develop a complete graph to determine solutions
- Assess the most viable method to find a function's derivative
- Construct an appropriate method to construct a function's derivative
- Given problems involving area bound by curves, apply techniques utilizing rectangles, trapezoids, Simpson's Rule and properties of definite integrals to find the area
- Given an illustration for a function of a single variable, examine the two complementary ideas of Calculus, (definition of derivative and integral) to construct the Fundamental Theorem of Calculus
- Given a specific function, $f(x)$, illustrate and analyze derivatives and antiderivatives using analytic tools