



RADNOR TOWNSHIP SCHOOL DISTRICT
Course Overview
Calculus - 05040452



General Information

Credits: 1
Unweighted
Prerequisite: Honors Precalculus or
Trigonometry/Discrete Math with a “B” or
teacher recommendation
Length: Year
Format: Meets Daily

Course Description

Traditionally, calculus has been the mathematics course taken by college freshmen. There is currently a growing realization that students need to be better prepared in mathematics and science. This need arises because of the ever-increasing role of computing in all disciplines. This course is focused on the student's understanding of the concepts of calculus from an intuitive point of view. Units from differential and integral calculus provide the main themes of this course, and practical applications of each area will be shown. This course is not intended as preparation for the Advanced Placement Calculus exam. While some students may be eligible for advanced standing in college calculus, all students will be prepared for a beginning college calculus course. A graphing calculator is required.

Course Objectives:

1. To develop the ability to think mathematically.
2. To enhance problem solving ability.
3. To utilize technology appropriately.
4. To be able to work with functions and apply them to the real world.
5. To reason and communicate mathematically.
6. Students should understand the meaning of the derivative in terms of a rate of change and local linear approximation and should be able to use derivatives to solve a variety of problems.
7. Students should understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change and should be able to use integrals to solve a variety of problems.
8. To challenge and expand the inquisitive and logical minds of the accelerated mathematics students.

Common Assessments:

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- Assignment sheets will be distributed periodically throughout the school year. Homework will be assigned on a daily basis. Individual assignments for each chapter can be viewed on the Mathematics Department page of Radnor High School's web site.
- Quizzes and tests will be given each chapter to measure understanding. Homework and classwork assignments will also be graded throughout the course.
- Departmental Midterm and Final Exam.

Major Units of Study:

Marking Period 1:

- Prerequisites: Solving Equations and Inequalities, Graphs of Equations, Linear Equations
- Functions and Graphs: Analyzing, Transformations, Combinations, Inverse Functions, Modeling
- Polynomial & Rational Functions: Quadratic and Higher Degree, Synthetic Division, Complex Numbers, Zeros of Polynomial Functions, Solving Rational Functions

Marking Period 2:

- Limits & Their Properties: Preview of Calculus, Finding Limits Graphically and Numerically, Evaluating Limits Analytically, Continuity & One-Sided Limits, Infinite Limits
- Differentiation: The Derivative & Tangent Line Problem, Basic Rules & Rates of Change, The Product & Quotient Rules

Marking Period 3:

- Differentiation: Higher Order Derivatives, Chain Rule, Implicit Differentiation, Related Rates
- Applications of Differentiation: Extrema on an Interval, Rolle's Theorem, Mean Value Theorem, Increasing & Decreasing Functions, First Derivative Test, Concavity, Second Derivative Test, Limits at Infinity, A Summary of Curve Sketching, Optimization Problems
- Integration: Antiderivatives, Indefinite Integration, Area, Riemann Sums, Definite Integrals

Marking Period 4:

- Integration: The Fundamental Theorem of Calculus, Integration by Substitution, Numerical Integration
- Exponential & Logarithmic Functions and Calculus: Differentiation and Integration
- Trigonometric Functions and Calculus: Differentiation and Integration

Materials & Texts

MATERIALS

Graphing Calculator (preferably TI-84+ model) & Appropriate Software Applications

TEXT

Calculus 1 with Precalculus (a one-year course) – Larson, Hostetler, Edwards
Houghton Mifflin Company Copyright 2002 – ISBN: 0-618-08760-5

Summer Assignment

None