

AP AB Calculus

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Text AP Calculus

Demana, Waits, Foley, Kennedy, Boston: Addison Wesley

Prerequisites:

This course will build on the foundation established with the prior study of functions, the properties of functions, the algebra of functions, and the graphs of functions. These functions include linear, polynomial, rational, exponential, logarithmic, logistic, trigonometric, inverse trigonometric, and piecewise-defined functions. Students should know the language of functions (domain, range, periodicity, odd and even, zeros, intercepts...) and know the values of the special trigonometric functions at the numbers 0, $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, and their multiples.

Course Description:

The primary purpose of this course is to develop the students' ability to understand the concepts of calculus and its methods and applications. This course represents a multi-representational approach to calculus with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally.

Evaluation: (subject to change)

65% tests quizzes

15% graded assignments and projects; biweekly problem sets

10% class work

10% homework

Technology:

Students are required to have graphing calculators

Expectations:

Successful mastery of the AP calculus curriculum will transpire only through active participation in class, consistent and persistent efforts to complete homework and project assignments, and thorough preparation for exams so that retention of material including relevant formulas, relevant mathematical terms, and techniques occurs. Students must be both prompt and regular with respect to attendance, and when absent, take responsibility to get relevant notes and assignments, and make arrangements to take exams.

Tutoring :

Extra help is available on a weekly basis by appointment. Morning and afternoon hours are available.

Code of Conduct and Academic Integrity:

Students are expected to abide by the Philadelphia School District's and J.R. Masterman's Codes of Conduct with respect to cheating, plagiarizing, use of electronic devices, and classroom behavior.

Late Policy:

Homework:

Homework is due on the following day. You may receive half credit for homework that is one day late (assuming you were not absent on due date). After one day, homework is not accepted for credit unless there are compelling reasons for an extension (i.e. extended illness).

Projects and Special Assignments:

There is a 10% penalty for each day a project or special assignment is late. After 5 days, the assignment will receive a zero (unless there are compelling reasons for an extension).

Tests:

Students who are absent on the day of the test must make the test up the following day. Failure to do so will result in a 10% penalty. If a student is absent for several days, leading up to and including the test day, then the student is required to meet with me to arrange a suitable time to take the exam.

Syllabus:

1st Quarter:

Chapters 1-3.4
Quarterly Exam-end of October

2nd Quarter

Chapters 3.5-4
Midterm Exam- mid January

3rd Quarter

Chapters 5-6
Quarterly Exam – End of March

4th Quarter

Selected topics in chapter 7, review
AP Exam- date to be announced

Course Topical and Chapter Outline

Chapter 1 – Prerequisites

- 1-3 through 1-6: Exponential Functions, Parametric Equations, Functions and Logarithms, Trigonometric Functions (3)
- Test covering summer review and topics in chapter 1
- Sub-Total Days (4)

Chapter 2 – Limits and Continuity

- 2-1 Rates of Change and Limits 3
- 2-2 Limits Involving Infinity 2
- 2-3 Continuity 2
- 2-4 Rates of Change and Tangent Lines 2
- Review, Test covering chapter 2 (2)
- Sub total days (11)

Chapter 3 – Derivatives (SC2)

- 3-1 Derivative of a Function (4)
- 3-2 Differentiability (1)
- 3-3 Rules for Differentiation (4)
- Review and test: 3-1 through 3-3 (2)

- 3-4 Velocity and Other Rates of Change (2)
- 3-5 Derivatives of Trigonometric Functions (3)
- 3-6 Chain Rule (4)
- Review and test 3-4 to 3-6 (2)

- 3-7 Implicit Differentiation (2)
- 3-8 Derivatives of Inverse Trigonometric Functions (2)
- 3-9 Derivatives of Exponential and Logarithmic Functions
- Review and test 3-7 to 3-9 (2)

Subtotal for chapter 3: (28)

Chapter 4 – Derivatives: Applications (SC3)

- 4-1 Extreme Values of Functions (2)
- 4-2 Mean Value Theorem (3)
- 4-3 Connecting f' and f'' with graph of f (3)
- Review and test 4-1 to 4-3 (2)
- 4-4 Modeling and Optimization (5)
- 4-5 Linearization: Newton's Method not included (1)
- 4-6 Related Rates (4)
- Review and test 4-4 to 4-6 (2)

Sub-Total Days 22

Chapter 5 – The Definite Integral

- 5-1 Estimating with Finite Sums (3)
- 5-2 Definite Integrals (4)
- 5-3 Definite Integrals and Antiderivatives (4)
- 5-4 Fundamental Theorem of Calculus (4)
- 5-5 Trapezoidal Rule (3)
- Review and Test (2)

Sub-Total Days 20

Chapter 6 – Differential Equations and Mathematical Modeling

- 6-1 Slope Fields and Euler's Method Separation of variables (4)
- 6-2 Antidifferentiation by Substitution (5)
- 6-4 Exponential Growth and Decay (4)

Review and Test 3

Sub-Total Days 16

Chapter 7 – Definite Integrals: Applications

- 7-1 Integral as Net Change (3)
- 7-2 Areas in the Plane (3)
- 7-3 Finding volumes with discs only (3)
- 7-4 Lengths of Curves (3)
- 7-5 Applications for Science and Statistics (3)

Sub-Total Days 15

AP Exam Review 30 days, as time permits

Additional Topics (after AP exam) as time permits:

- 6-3 Integration by Parts 3
 - 6-5 Logistic Curve 2
 - 7-3 Volumes: Shell Method 2
 - 7-5 Work Problems 2
- Project involving finding volumes using disc/shell method (5)
Days: 14+

Please sign below indicating that you have read and that you understand the course requirements as stated above.

Student

Parent