



AP Calculus AB Syllabus & Information

2019-2020 School Year

Teacher: Ms. Carrell
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Conference Period: 6th Period
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Textbook: Calculus 10e AP Edition R. E. Larson, B. H. Edwards CENGAGE Learning

Grades: 25% Daily Work (homework, problem sessions, quizzes, etc.); 75% Tests

Homework: Homework should be completed for your benefit. Will be assigned every night with very few exceptions, and all work is to be kept in an organized manner (problems **are** to be copied) and will be turned in as directed. If you are absent, you are responsible for doing all work that you have missed and including it with your other work. Grades will be calculated on the basis of completeness (80% or more complete = 100%; <80% will be a zero); however, sufficient work (this **includes** true/false) must be shown in order to receive credit for a problem. **Homework will be collected randomly, and multiple homework grades may be taken at one time.** You are therefore encouraged to keep up with all assignments.

Problem Sessions: Problem sessions consist of multi-part, challenging essay-type (AP) questions (or an appropriate number of multiple choice questions) that usually come directly from past Advanced Placement exams. The purposes of the problem sessions are (1) to teach you to present **well-justified** solutions that can be understood by anyone who is asked to grade your paper, (2) to prepare you for the types of problems that will be on the AP exam in May, and (3) to help you to permanently learn the material of the course. Adequate justification is required for all solutions in order to receive full credit for a problem. These problem sessions should be **kept all year** organized in a notebook so that you will have them as a study guide for the AP exam in May.

Quizzes: Quizzes may cover any material; however, the majority of problems will usually refer to recent lessons.

Tests: Major tests are given at the end of each unit and may cover review material from previous units. There will be at least three tests per grading period. **If you are absent only on days of review before a test (meaning you have not missed a lesson before the test), you will be required to take the test with the class.** Major tests can be made up during A lunch on Monday, Wednesday or Friday and during B lunch on Tuesday or Thursday in room B1-162. You must bring a valid ID. A two-week time limit is allowed for make-up of major tests.

AP Exam: The Advanced Placement Exam for AB Calculus will be given Tuesday, May 5, 2020 at 8:00 a.m. **ALL** students are expected to take this exam. (College credit is granted by the individual university. Therefore, students should check with prospective colleges for their particular Advanced Placement policy.) According to the College Board, "each student will be expected to bring to the examination a graphing calculator on which the student can:

- (1) produce the graph of a function within an arbitrary viewing window;
- (2) find the zeros of a function;
- (3) compute the derivative of a function numerically; and
- (4) compute definite integrals numerically.

These capabilities may be either built into the calculator or programmed into the calculator by the student prior to the examination. Calculator memories will not be cleared. Computers, non-graphing scientific calculators, devices with a QWERTY keyboard, and electronic writing pads are not allowed."

Recommended calculator: TI-84+CE or TI-89 Titanium

Google Classroom: All notes and homework solutions will be posted here, as well as quiz solutions. Both students and parents can join the group by creating an account at classroom.google.com. **The class code for our group is: bunby65.**

Remind: Text **@3hf7akk to 81010** to join.

CollegeBoard Classroom: Z76XZV

Extra Assistance: Tutoring is available daily at 7:30 a.m. and other times upon request. In addition, the math department will provide, upon request, a list of private tutors. It is my desire that each student be successful this year. Please feel free to discuss any concerns with me.

First Semester Topics

Limits and Continuity, Derivatives
Application of the Derivative
The Indefinite Integral
Slope Fields

Second Semester Topics

Integration
Transcendental Functions
Applications of Integration
Integration Techniques

AP Calculus AB 1st Semester Objectives

- Evaluate limits of algebraic and trigonometric functions and combinations thereof as x approaches a finite value or at infinity or determine that limits do not exist.
- Evaluate two-sided limits of algebraic and trigonometric functions and combinations thereof and determine continuity in terms of limits.
- Develop the concept of derivative as an instantaneous rate of change and determine a derivative as a limit, as a difference quotient, and from graphs and tables of data.
- Find first and higher order derivatives of elementary functions and their sums, differences, products and quotients.
- Find first and higher order derivatives of composite functions.
- Find derivatives of implicitly and piecewise defined functions.
- Use the first derivative to find increasing and decreasing intervals, determine extrema, and apply the Mean Value Theorem and its geometric consequences.
- Use the first and second derivatives to find intervals of concavity, determine points of inflection, solve rectilinear motion problems and determine extrema using the second derivative test.
- Write equations of tangent and normal lines, and use the tangent line to estimate values of functions.
- Use derivatives to solve optimization and related rate problems.
- Use antiderivatives to evaluate indefinite integrals involving algebraic and trigonometric functions (sine and cosine only), solve first-order separate differential equations and represent the general solution of a differential equation using slope field.

AP Calculus AB 2nd Semester Objectives

- Find indefinite integrals following directly from derivatives of elementary functions and by substitution of variables.
- Find derivatives of exponential, logarithmic, inverse functions, inverse trig functions.
- Find derivatives of inverse trig functions and use both logarithmic differentiation and L'Hospital's Rule.
- Find indefinite integrals following directly from derivatives of logarithmic, exponential and inverse trig functions.
- Apply the indefinite integral to solve separable differential equations (in particular, $y'=ky$ and the exponential growth and decay model) and find specific antiderivatives using initial conditions, including applications of motion along a line.
- Develop the concept of the definite integral by approximations using left, midpoint, and right Riemann Sums and Trapezoidal Rule and using basic properties of definite integrals to evaluate given integrals.
- Apply the definite integral to find total distance traveled given the velocity or acceleration and to find the area of the bounded region.
- Apply the definite integral to find total distance traveled given the velocity or acceleration and find the volume of a solid of revolution.
- Apply the First Fundamental Theorem of Integral Calculus to evaluate definite integrals, find the average value of a function, find the accumulation of a function over an interval given its rate of change, and interpret the meaning of a given definite integral.
- Apply the Second Fundamental Theorem of Integral Calculus to find the derivative of a function defined as a definite integral and identify the characteristics of a function defined as a definite integral.

Parent Survey: tinyurl.com/carrellparent1920