

AP Calculus AB: The Mathematics of Change

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Curriculum

Topics covered in accordance with official Course Description for AP Calculus AB. Include function behavior and analysis using the limit operator, investigations with infinity, a rigorous inquiry into continuity, the limit definition of derivative and instantaneous change, tangent line approximations, derivative rules, curve sketching, rectilinear motion and other applications, integration as antidifferentiation and infinite Riemann sum, integral as accumulator and curve area/rotational volume and other applications.

As an AP course, students will be involved in open-ended student-driven investigations, read complex passages to build background and depth, select and integrate appropriate technology into their study, solve challenging, multi-faceted problems, and complete projects relevant to real-world scenarios. Significant time each week will be spent preparing for the AP exam on May 15 2018. Four key concepts: Limits, Derivatives, Integrals, and Integration Techniques/Applications.

Four key approaches to each concept: Be able to explain each skill Verbally, Numerically, Algebraically, and Graphically.

Supplies

- 3-ring binder which always contains:

1 subject notebook for notes loose leaf notebook paper graph paper
3 tab dividers: Handouts, Homework, Assessments pencils/colored pencils

- TI-84+ Calculator (in-class set available); if you have an iOS/Android device, please install the Desmos app

- Textbook: Larson & Edwards. (2014). *Calculus of a Single Variable* (10th ed.). Odd # Solutions: calcchat.com

-**5 dollar math department fee** Preferably paid online.

Taking Notes: Do not use loose-leaf paper. Take calculus notes in a bound 1-subject notebook that you do not use for any other class. This will help you keep organized. You can do your homework in your notebook if you wish.

Rules

1. Always do your homework. Your learning is your responsibility.
2. Arrive to class on time and prepared with materials, homework, and an open mind.
3. Show respect to everyone. Lower your volume when directed.
4. No more than 3 persons may leave the room for bathroom/water in a class period. Do not use up a slot from someone who needs it because you are bored or want to take a break. Agendamate required.
5. No phones or headphones. Do not use your phone calculator in the classroom. Handbook rules enforced.
6. Use only your assigned TI84 calculator (or your own).
7. No food and no drinks except water. I will make you throw it away.
8. Keep your desk and surrounding area clean. There should be nothing on the floor/desk when you leave.
9. Don't be afraid to ask questions.

A typical day

Arrive to class on time with your supplies as listed above. Collect your calculator and take your seat. Copy down goals and homework into Agendamate. Look over homework or start warmup before bell rings. When bell rings and a chime sounds, rise, greet the teacher (“Good afternoon, Mr. Mohyuddin”), take a deep breath, and be seated.

After the warm-up, I display answers to the homework and call for questions. You self-assess your work, marking incorrect answers and making comments as needed. You place your homework in the correct part of your binder. After this, we begin our lesson which may align with a section in the textbook but could focus on a handout or other resource. Some lessons are direct instruction during which you take detailed notes; others are group activities where engagement and involvement is required; and others are investigations where a new problem is presented and the skills to solve it are developed as you work. When the lesson is over, there may be time to work on practice problems or re-take an assessment. At the end of a class, we take a moment to summarize today's learning and clean up the room before the bell rings to dismiss. Please put your chairs atop the desks to assist the custodians when they clean.

Grades

I use a system called Standards Based Grading. Your grade is entirely based on mastery of individual learning targets, which Tennessee, the College Board, and HCDE specify and over which the AP Exam will test. The most recent score on a skills assessment is what is entered in PowerSchool. You may retake an assessment only if you complete the assigned homework for that standard. Retakes are usually done in directed studies. You can retake every grade. It works like this:

1. During a particular week in class, we cover skills X, Y, and Z during lessons and activities. Homework is assigned that goes over these skills.
2. The following Monday (usually), we will have an assessment that covers these (and other) skills. They are graded on a scale of 0-4 (outlined below). Each standard is scored separately, so there will be a score for X, a score for Y, a score for Z, and a score for W (an older standard being assessed again). These assessments may only be 4-5 problems long, though others may be longer. (Usually 1 or 2 questions per standard.)
3. If you score less than a 3, you are required to re-take the assessment (in directed studies or after school). Mastery of a skill is achieved only when you have scored two consecutive 3's or higher. If you score a 4 on a skill the first time it is assessed, but on an assessment a month later you score a 2 on that same standard, the grade you earn is a 2. It is then your responsibility to re-assess until you pass. Every standard will be assessed multiple times throughout the quarter.

Score	Grade in PS
4: Advanced (Complete understanding of the concept. Can apply this concept to situations beyond what is expected.)	96
3: Proficient (Understanding of the concept possibly with minor errors.)	86
2: Basic (Some understanding of the concept with major errors. Needs to remediate this concept.)	66
1: Below Basic (Does not have an understanding of this concept. Intense remediation is necessary.)	50
0: No attempt was made.	0

If a student scores a 4 on their first two assessments, s/he will receive a 5 (or 100) for that standard.

This seems like a more complicated system, but instead of a single test you have more opportunities to show mastery and it is you, not the teacher, who controls the grade. Bottom line: if you learn the material, your grades will show it. More info: <http://mcalc.weebly.com/sbg>

Assessments

Tests will normally be on Mondays. Advance notice is always given for changes. Remember that a score may change, as your most recent score on a skill is what is reflected. Re-assessments require proof of homework completion. Some tests will have calculator and no-calculator sections, just like the AP Test.

Absences/Class Website

The class website, mcalc.weebly.com, has a detailed breakdown of what material is covered *each day* in class along with digital versions of notes, handouts and numerous hand-picked (and sometimes, hand-created) help resources aimed at helping you. This is also where I post solutions to practice tests. Some extra copies are kept in class. You are expected to visit the class website to get the missed assignment and other materials. It is updated every day you have class.

Et cetera

Calculus is difficult, but there are numerous resources online to help you. I have posted some at mcalc.weebly.com/help I am involved with our monthly on-campus mathematics contests. Keep an eye out for competition dates in the near future. Tutoring is available after school: Tuesdays, 4-5p. This is also a good time for retakes if needed.

Student Survey link: <http://bit.ly/calinfo17>

Family Survey link: <http://bit.ly/parentcalc2>

Easy to complete on computers, tablets, and phones!