AP Exam Prep Ideas (2011)

- Take old AP Free response questions and time yourself. Grade them using the Scoring Guidelines.
- Look at the Sample Responses and the Scoring Commentaries. These let you see past student's responses and they describe why they got the grade they received.
- Look at the multiple choice questions on the AP Calculus AB Course Description.

Do not forget…

1. Slope fields are easy, so do not forget to review them.

2. Limit process to find derivatives is that long ugly method with $\lim\limits_{\Delta x \to 0}$.

3. Piecewise-defined functions are when you use several functions to create a single function.

4. $y' = ky$ leads to $y = Ce^{kt}$ which is also were $A = Pe^{rt}$ comes from.

5. With volume problems, know when to use Disk, Washer, and Perpendicular Cross Sections.

6. Riemann sums: Left, Right, Midpoint, Trapezoid (Numerical Approximations).

7. Knowing how to sketch f and f'' if you are given the graph or table of values for f'.

8. Understand the relationships between position, velocity, and acceleration.

   a. Speed = |v(t)| , Total Distance = $\int_a^b |v(t)|\,dt$ and Position = Initial Position + $\int_a^b v(t)\,dt$.

9. 2nd Fund. Theorem of Calculus is the derivative of an integral. $\dfrac{d}{dx}\int_a^{x^3} (t^2 - 2t)\,dt = \left(\left(x^3\right)^2 - 2\left(x^3\right) \right)\left(3x^2\right)$

10. Remember that $\int_b^a f(t)\,dt = -\int_a^b f(t)\,dt$.

11. Understand how to manipulate symbolic concepts since not all problems are asking you to just solve things.

12. Be careful not to integrate when you are supposed to derive and vice versa.

13. When finding the definite integral of a derivative (Rate) function, you are finding the total change (sum of the change) from a to b.

14. Whenever you see a function increasing/decreasing, you are taking the derivative of that function.

15. Be careful on chain problems with multiple steps.

16. Don't forget to check endpoints with absolute extrema.

17. Remember extrema and points of inflections are where the sign changes.

18. You MUST understand all the small details of every major concept. Ex: Differentiability implies continuity, but continuity does not imply differentiability.

19. Review the Chapters 3 and 4 Overview sheets I gave you earlier in the year.

On the multiple choice sections…

- Put an answer, because you **do not** lose points for guessing.
- Look at the answers before you start solving anything. They can guide you or give you hints.
- Skip hard problems and come back to them. Don't make small mistakes. They love to hook you with "Pretty" answers.

On the free response sections…

1. If you use your calculator to solve something, don't forget to write out the setup. Use the graphing calculator to only do the following four Calculus functions, otherwise show your work. 1) Graph functions in an arbitrary window. 2) Calculate zeros of a function. 3) Calculate the derivative of a function. 4) Calculate the integral of a function. (Example: You need to show your work for finding max/min and not just the calculator button. The calculator can check you answer though.)

2. Answers must be correct to 3 decimal places.

3. Sign charts are not sufficient for justifying extrema with 1st Derivative Test.

4. In order to best fit your graphs on your calculators, first adjust the domain(x-values) and then press ZoomFit.

5. You do not need to show intermediate steps. If you show them and make a mistake, but get the right answer, then you can lose points.

6. You do not need to simplify expressions.

7. Values are only the y, while the coordinate is (x,y).

8. When justifying, don't use the word "it". Be specific. Ex: State which function or the exact interval.

9. Don't forget + c on indefinite integrals.

10. Don't forget dx or dy on integrals.

11. Don't forget to write $\lim_{x \to c}$ for each step when solving a limit.

Global Tips for Your Students by Dan Kennedy , Baylor School; Chattanooga, Tennessee

http://apcentral.collegeboard.com/apc/members/exam/exam_tips/4045.html

Show all work.
Remember that the grader is not really interested in finding out the answer to the problem. The grader is interested in seeing if you know how to solve the problem.

Do not round partial answers.
Store them in your calculator so that you can use them unrounded in further calculations.

Do not let the points at the beginning keep you from getting the points at the end.
If you can do part (c) without doing (a) and (b), do it. If you need to import an answer from part (a), make a credible attempt at part (a) so that you can import the (possibly wrong) answer and get your part (c) points.

If you use your calculator to solve an equation, write the equation first.
An answer without an equation might not get full credit, even if it is correct.

If you use your calculator to find a definite integral, write the integral first.
An answer without an integral will not get full credit, even if it is correct.

Do not waste time erasing bad solutions.
If you change your mind, simply cross out the bad solution after you have written the good one. *Crossed-out work will not be graded.* If you have no better solution, leave the old one there. It might be worth a point or two.

Do not use your calculator for anything except:
(a) graph functions, (b) compute numerical derivatives, (c) compute definite integrals, and (d) solve equations. In particular, do not use it to determine max/min points, concavity, inflection points, increasing/decreasing, domain, and range. (You can explore all these with your calculator, but your solution must stand alone.)

Be sure you have answered the problem.
For example, if it asks for the maximum value of a function, do not stop after finding the x at which the maximum value occurs. Be sure to express your answer in correct units if units are given.

If you can eliminate some incorrect answers in the multiple-choice section, it is advantageous to guess.
Otherwise it is not. Wrong answers can often be eliminated by estimation, or by thinking graphically.

If they ask you to justify your answer, think about what needs justification.
They are asking you to say more. If you can figure out why, your chances are better of telling them what they want to hear. For example, if they ask you to justify a point of inflection, they are looking to see if you realize that a sign change of the second derivative must occur.

Top Ten Student Errors

1. $f''(x) = 0 \iff (x, f(x))$ is a point of inflection.
2. $f(x)$ is a maximum (minimum) $\iff f'(x) = 0$.
3. Average rate of change of f on [a, b] is $\dfrac{f'(a) + f'(b)}{2}$
4. Volume by washers is $\int_a^b \pi(R - r)^2\, dx$.
5. Separable differential equations can be solved without separating the variables.
6. Omitting the constant of integration, especially in initial value problems.
7. Graders will assume the correct antecedents for all pronouns used in justifications.
8. If the correct answer came from your calculator, the grader will assume your setup was correct.
9. Universal logarithmic antidifferentiation: $\int \dfrac{1}{f(x)}\, dx = \ln|f(x)| + C$.
10. $\dfrac{d}{dx} f(y) = f'(y)$ and other Chain Rule errors.