AP Calculus BC

Common Mistakes ·

On this exam the points are for COMMUNICATION as much as for calculus: the integral you set up, the units you attach, the theorem you name. Everything below is a rule the readers actually apply.

Presentation – where the points are won and lost

✗ Writing the numerical answer a calculator produced with nothing above it.

✓ **Write the definite integral or the derivative expression first, then the value.**

The guidelines state repeatedly that an answer with no supporting work does not earn the point, even when it is correct.

SG 4 years

✗ Rounding an answer to two decimal places.

✓ **Give three places after the decimal point, by rounding or truncating.**

An inappropriately rounded answer does not earn the point – the three-place rule is on the exam's own instructions.

SG 5 years

✗ Writing the integral, then a different number, and hoping the reader follows.

✓ **Make the line from the integral to the value unbroken.**

The guidelines treat incorrect or unclear communication between the integral and the answer as scratch work, which is not scored.

SG 4 years

✗ Writing a fraction with an ambiguous bar, or omitting brackets.

✓ **Make the fraction bar span exactly what it should, and bracket every substituted expression.**

The guidelines state parentheses must be used correctly and fraction bars clearly and correctly proportioned.

SG 3 years

✗ Crossing nothing out and leaving two attempts on the page.

✓ **Cross out what you do not want read. Scratch work is not scored, but a contradiction is.**

Where a response presents a correct value alongside an incorrect one, the readers are not free to choose the right one.

SG 3 years

✗ Panicking after an arithmetic slip.

✓ **Carry on. A later point can still be earned from an earlier wrong value used correctly.**

The guidelines award subsequent points on consistent use of a candidate's own value, and treat arithmetic slips after a correct solution as scratch work.

SG 3 years

1 · Limits and Continuity

✗ Evaluating a limit by substitution and writing $0/0$ as the answer.

✓ **Recognise the indeterminate form, then factor, rationalise, or apply L'Hospital's Rule.**

The guidelines award a point for USING the rule, separately from the answer, so the method has to be visible.

$0/0$

SG 3 years

✗ Asserting a function is continuous and using a theorem.

✓ **Justify the continuity first – the readers do not accept an unjustified statement.**

A response that simply states a function is continuous without justification does not earn that point.

SG2023

✗ Applying the Intermediate Value Theorem without checking its conditions.

✓ **State that the function is continuous on the closed interval and that the value lies between the endpoints.**

The readers do not require the theorem to be NAMED, but if it is named it must be named correctly and its conditions met.

SG2023

4 · Contextual Applications of Differentiation

✗ Answering a rate question with a number and no units.

✓ **Attach them: cubic metres per minute, degrees per second.**

Units are a scored component in the contextual-application questions, and they are the cheapest point on the paper.

SG 4 years

✗ Saying a quantity is increasing because the derivative is positive, without evaluating it.

✓ **Show the value, then the conclusion: $v(3) = 0.042 > 0$, so the particle is moving right.**

The guidelines award the conclusion point only in the presence of the value that supports it.

SG2023

✗ Reporting a related-rate expression without solving for the rate asked for.

✓ **Differentiate, substitute, then isolate the derivative the question names.**

The guidelines note responses that present an expression and fail to complete it earn only the earlier point.

SG2024

5 · Analytical Applications of Differentiation

✗ Finding a critical point and calling it the maximum.

✓ **Justify it: say why it is a maximum – a sign change, the second derivative, or that it is the only critical point on a closed interval.**

The justification is a separate scored component, and this is the phrasing the guidelines credit.

SG 3 years

✗ Answering an absolute-extremum question without checking the endpoints.

✓ **Compare the critical values with both endpoint values.**

On a closed interval the extremum can sit at an endpoint, and the comparison is what the readers look for.

SG2023

6 · Integration and Accumulation of Change

✗ Writing a Riemann-sum answer with none of the products shown.

✓ **Show the three or four products before you add them.**

The guidelines state a correct value with work that does not show the products does not earn the point.

SG 3 years

✗ Using a left sum where a trapezoidal sum was asked for.

✓ **The trapezoidal sum is the AVERAGE of the left and right sums – check which the question names.**

The readers note the equivalence, and a completely correct sum of the wrong type still earns nothing.

SG2023

✗ Writing $\int f(t)\,\mathrm{d}t$ with no limits.

✓ **A definite integral needs both limits, and the variable of integration must match.**

The guidelines describe responses that never present the definite integrals as a special case that loses the points.

SG 3 years

8 · Applications of Integration

✗ Giving the value of an accumulation question without the initial condition.

✓ **Position is the initial value PLUS the integral of the rate.**

The guidelines set out this exact structure, and an integral alone is not the quantity asked for.

SG 3 years

✗ Setting up an area or volume integral with the curves the wrong way round.

✓ **Sketch first, and subtract the lower from the upper.**

A sign error here produces a negative area, which the readers treat as a wrong answer rather than a slip.

CED 8.4

■ Where a question says JUSTIFY, the sentence explaining why is the point. Where it says SHOW, every interim step must be on the page.

SG 4 years

2 · Differentiation: Definition and Fundamental Properties

✗ Differentiating a product as the product of the derivatives.

✓ $(uv)' = u'v + uv'$ – **write the rule out before substituting.**

The readers award a point for the correct form of the rule, separately from the algebra that follows.

CED 2.8

✗ Simplifying a quotient-rule derivative and dropping a sign.

✓ **Leave it unsimplified if you are unsure – an unsimplified correct answer scores.**

The guidelines state a response presenting a subsequent simplification error does not earn the later point, while an unsimplified correct expression does.

SG2024

3 · Differentiation: Composite, Implicit, and Inverse Functions

✗ Differentiating implicitly and forgetting $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ on the y terms.

✓ **Every y differentiated brings a factor of $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ with it.**

The guidelines award the point for CONSIDERING $\mathrm{d}y/\mathrm{d}x$, so the missing factor loses it at the first line.

dy/dx

SG2024

✗ Answering a tangent-line question with the slope only.

✓ **Give the equation of the line, through the point the question names.**

The question asks for a line; a gradient is not one.

CED 4.1

7 · Differential Equations

✗ Separating a differential equation and never finding the constant.

✓ **Use the initial condition to solve for C, then write y explicitly.**

The particular solution is what the question asks for; a general solution is an earlier point only.

CED 7.7

✗ Leaving the answer as $\ln|y| = \ldots$

✓ **Exponentiate and solve for y, choosing the branch the initial condition sets.**

An implicit answer is not the explicit function the question names.

y

CED 7.7

✗ Sketching a slope field by computing every point.

✓ **Compute a few, and use the structure – where the slope is zero, positive, or undefined.**

The readers score the qualitative features, not the number of segments drawn.

CED 7.3

■ Angle measures are assumed to be in radians, and solutions to equations must be real numbers. Both are stated on the exam's own general scoring notes.

, SG 2 years

✗ Answering a 'how many' or 'at what time' question with the equation you solved.

✓ **Give the value, to three decimal places, with its units.**

The final answer is a separate scored component from the setup that produced it.

SG 3 years

✗ Reporting an interval as an inequality about the wrong variable.

✓ **Check what the question asked for – a time interval, a set of x-values, or a set of function values.**

The guidelines note that endpoint values must be accurate to the required decimal places AND describe the right quantity.

SG2024