AP Calculus AB

Common Mistakes · 常见错误

Calculus points are lost to language and to unjustified steps far more than to algebra. Units, a stated theorem, and an interpretation in context are each worth marks that a correct number alone does not earn.
微积分失分多在表述: 单位、定理条件与情境解释都单独计分。

Communication

Giving a rate with no units and no reference point. Write 'the volume increases at 3 cm^3 per second at t = 4'.

Answering 'interpret in context' by restating the calculation. Say what the quantity MEANS for the situation described.

Invoking the Mean Value Theorem or Intermediate Value Theorem without stating that the hypotheses hold. The justification is the mark, not the conclusion.

Writing a chain of equalities that is not true – for example carrying an equals sign across a step where the quantity changes.

Erasing work. Cross out instead: an abandoned correct method can still earn marks, and erased work earns none.

Derivatives

Forgetting the inner derivative in the chain rule.

Reversing the quotient rule's numerator, which flips the sign of the whole answer.

Finding a stationary point and not classifying it. A sign change in f or the sign of f is a separate step.

Claiming a point of inflection wherever f = 0. The second derivative must CHANGE SIGN.

In a related-rates problem, substituting the numerical values before differentiating, which freezes the quantity that was supposed to vary.

Integrals

Omitting + c from an indefinite integral.

Forgetting to change the limits when substituting, or changing them and then substituting back as well.

Treating a definite integral as 'the area' when part of the curve is below the axis. It is the NET signed area.

Saying the integral of a rate is the quantity. It is the NET CHANGE in the quantity over the interval, and the starting value must be added.

Using the Fundamental Theorem on an accumulation function without applying the chain rule when the upper limit is itself a function.

Calculator and setup

Giving a decimal answer to fewer than three decimal places when the question permits a calculator.

Writing only calculator syntax as the ‘work’. Show the integral or derivative in standard notation before the numerical answer.

Leaving the calculator in degrees for a trigonometric calculus problem – everything in this course is in radians.