

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. 本科评分看“表达”与“计算”并重: 积分要写出来、单位要带上、定理要点名。

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.

先写式子再写答案

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.

小数保留三位

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.

式子与答案要对得上

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.

括号和分数线要清楚

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.

不要的过程要划掉

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.

算错也要继续做

SG 3 years

1 · Limits and Continuity 极限与连续性

- ✗ 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 要继续处理

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.

连续性要先说明理由

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.

用定理要先验证条件

SG2023

4 · Contextual Applications of Differentiation 微分在实际情境中的应用

- ✗ 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.

变化率要带单位

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.

先算出导数值再下结论

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.

要解出题目要求的那个变化率

SG2024

5 · Analytical Applications of Differentiation 微分的分析性应用

- ✗ 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.

极值要写出判断依据

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.

闭区间要比较端点

SG2023

6 · **Integration and Accumulation of Change** 积分与变化的累积

✗ 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.

黎曼和要写出每一项

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.

看清是左和、右和还是梯形和

SG2023

✗ Writing $\int f(t) dt$ 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.

定积分要写上下限

SG 3 years

8 · **Applications of Integration** 积分的应用

✗ 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.

累积量要加初始值

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.

面积要用上减下

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.

“说明理由”与“证明”都要写过程

SG 4 years

2 · **Differentiation: Definition and Fundamental Properties** 微分: 定义与基本性质

✗ 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.

乘法法则要先写出来

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.

不确定就不要化简

SG2024

3 · **Differentiation: Composite, Implicit, and Inverse Functions** 微分: 复合、隐式与反函数

✗ Differentiating implicitly and forgetting $\frac{dy}{dx}$ on the y terms.

✓ **Every y differentiated brings a factor of $\frac{dy}{dx}$ with it.**

The guidelines award the point for CONSIDERING dy/dx , so the missing factor loses it at the first line.

隐函数求导要带 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.

切线要写出方程

CED 4.1

7 · **Differential Equations** 微分方程

✗ 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.

要用初始条件求出常数

CED 7.7

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

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

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

要解出 y 的显式表达

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.

斜率场看整体特征

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.

角度用弧度, 解必须是实数 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.
最后要给出数值答案 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.
看清区间是关于哪个量 SG2024