

In this subject most lost marks are lost to presentation and accuracy, not to method. Everything below is taken from Cambridge's own examiner reports. The $\times$ line is what candidates do; the $\checkmark$ line is what scores. 这门课失分多在书写与精度, 而非方法。 $\times$ 是常见做法, $\checkmark$ 是能得分的做法。

Accuracy and communication – where most marks go

- $\times$ Writing down the value a calculator produced, with nothing above it.

$\checkmark$ **Show the equation you solved and the substitution you made, then the value.**

The front cover says no marks are given for unsupported answers from a calculator. Examiners have raised it in four consecutive reports.

计算器答案必须有过程ER 6 sessions P3

$\times$ Rounding to three significant figures partway through and using that in the next line.

$\checkmark$ **Work to at least four significant figures throughout, and round only the final answer.**

Three-figure accuracy cannot be justified from three-figure working, so the accuracy mark is lost even when the method was right.

过程留 4 位, 答案给 3 位ER 5 sessions P3

$\times$ Giving an exact answer as a decimal – writing 1.41 for $\sqrt{2}$, or 1.05 for $\frac{\pi}{3}$.

$\checkmark$ **Exact answers exactly, non-exact answers to three significant figures, angles to one decimal place.**

The rubric distinguishes the two, and examiners state that only non-exact answers should be rounded at all.

精确值就写精确值ER 5 sessions P3

$\times$ Evaluating θ when the question gave $\sin \theta = 0.12$ exactly.

$\checkmark$ **Keep it exact and work with $\sin \theta$ and $\cos \theta$ directly.**

Raised in five separate reports: converting an exact angle to a decimal introduces an approximation that costs the accuracy mark later.

角度给了精确值就不要算出来ER 5 sessions P4

$\times$ Spreading a solution across the page, then continuing it somewhere else.

$\checkmark$ **Work down the page in order, and label which part you are answering.**

Examiners describe unclear use of the response space as the reason good work could not be followed, in eleven separate sessions.

按顺序、分区书写ER 11 sessions P5

$\times$ Giving one number where the question asked for the median AND the interquartile range.

$\checkmark$ **Label each answer: median = 27, IQR = 14.**

Where more than one item is demanded, examiners require each to be identified – an unlabelled pair of numbers is ambiguous.

多个答案要分别标明ER 2 sessions P5

A-Level Mathematics · Common Mistakes 常见错误

1

$\times$ Meeting an unstructured final question and not knowing where to start.

$\checkmark$ **Write down what you are given, what you want, and the relationship that connects them. Then work.**

Examiners record candidates unsure where to begin on unstructured questions, and note it was very unclear what many were attempting.

无结构题: 先列已知与所求ER 2 sessions P3

$\times$ Spending so long on one question that later parts are left blank.

$\checkmark$ **Move on when a question stalls, and come back.**

Examiners note there was enough time, but that some candidates did not manage it – unattempted parts are marks nobody could award.

卡住就先跳过ER 7 sessions P5

$\blacksquare$ Basic algebra and trigonometry are where difficult papers are decided. Examiners state plainly that secure manipulation is what separates the responses.

代数与三角是基本功ER 5 sessions P3

$\blacksquare$ Reread the question after finishing. Examiners repeatedly find correct work that answered a slightly different question.

做完再读一遍题ER 2 sessions P3

1 · Pure Mathematics 1 纯数学 1

$\times$ Expanding $80(px)^2$ as $80px^2$.

$\checkmark$ **Square the whole bracket: $80p^2x^2$.**

A named error in a binomial expansion question, where the rest of the method was correct.

括号整体平方ER Jun24 P12

$\times$ Squaring $|3x - 1| = |x + 5|$ and forgetting to square the $3x$ term.

$\checkmark$ **Square both sides completely, or form the two linear equations instead.**

Examiners note that candidates who formed two linear equations had more success, and that the squaring route failed on this exact slip.

两边要完整平方ER Jun23 P11

$\times$ Sketching $y = |x + 7|$ with its vertex in the wrong place.

$\checkmark$ **The graph of $y = |x + a|$ has its vertex at $x = -a$.**

Examiners were surprised how many could not position the line, which then made the whole solution impossible.

顶点在 $x = -a$ ER Nov24 P12

3 · Pure Mathematics 3 纯数学 3

$\times$ Differentiating $\ln(f(x))$ with the power rule.

$\checkmark$ **Use the chain rule: $\frac{d}{dx} \ln f(x) = \frac{f'(x)}{f(x)}$.**

Examiners record incorrect use of the power rule on a logarithm as the common error, with few correct solutions seen.

对数求导用链式法则ER Jun24 P32

A-Level Mathematics · Common Mistakes 常见错误

2

✗ Applying the chain rule and losing the coefficient inside the bracket.

✓ **Multiply by the derivative of the inside as well:** $\frac{d}{dx} \sin 3x = 3 \cos 3x$.

Examiners note errors with the coefficients among the few candidates who used the chain rule at all.

链式法则别丢系数

ER Nov23 P32

✗ Starting part (b) from scratch when part (a) produced the result it needs.

✓ **Look back: if (a) gives an identity, (b) is usually the integral of it.**

Examiners state that few candidates connected the integrand in (b) to the result in (a); those who did found it straightforward.

后一问常用前一问的结果

ER Jun23 P33

✗ Using synthetic division and dropping the leading factor.

✓ **Use algebraic long division, or track the factor of 3 through the synthetic method.**

Examiners note the most successful solutions used long division, and that the synthetic route lost the factor.

综合除法别丢首项系数

ER Jun24 P31

✗ Evaluating a complex-number expression on a calculator and writing the answer.

✓ **Show the algebra – the multiplication by the conjugate, the real and imaginary parts.**

Examiners remind candidates that calculators cannot be used in complex-number questions, because the working is what is being marked.

复数题必须写过程

ER 2 sessions P3

✗ Answering an iteration question by substituting the two values and stopping.

✓ **State that the sign changes between them, so a root lies in the interval – then iterate.**

Examiners report very few correct methods, with candidates recognising the sign change but not saying what it proves.

变号说明区间内有根

ER Nov24 P32

4 · Mechanics 力学

✗ Using $v = u + at$ where the acceleration is given as a function of time.

✓ **Integrate: the constant-acceleration formulae do not apply.**

Examiners state this directly in five sessions. Using *suvat* on a variable acceleration is a method mark lost immediately.

变加速必须用微积分

ER 5 sessions P4

✗ Writing a Newton's second law equation without drawing the forces first.

✓ **Draw and annotate the force diagram, then write one equation per body.**

Named in seven reports as the way to make sure every term is included – omitted terms are the commonest mechanics error.

先画受力图

ER 7 sessions P4

✗ Writing all three possible equations for connected particles and using the wrong two.

✓ **Choose the two that contain the unknown you want, and say which body each is for.**

Examiners describe the main errors as arising from the combination chosen, not from the physics.

选对两个方程

ER 2 sessions P4

✗ Resolving on an inclined plane without checking which component takes $\sin \theta$.

✓ **Component down the slope is $mg \sin \theta$; perpendicular to it is $mg \cos \theta$.**

Examiners recommend an annotated diagram for inclined planes specifically, because the terms are what candidates omit.

沿斜面用 $\sin$, 垂直用 $\cos$

ER 2 sessions P4

5 · Probability & Statistics 1 概率与统计 1

✗ Drawing a tree diagram with the branches in the wrong order and answering from it.

✓ **Build the tree first and check the branch probabilities sum to 1 at every node.**

Examiners state that candidates whose tree was incorrectly structured were unlikely to answer the question at all.

树状图结构要先检查

ER 2 sessions P5

✗ Writing only the final value of $E(X)$ and $\text{Var}(X)$.

✓ **Show the unsimplified sum first: $E(X) = \sum xp$, with the products written out.**

Examiners commend the full unsimplified calculation because it is the evidence the method mark is for.

先写展开式再算

ER 2 sessions P5

✗ Estimating from a cumulative frequency graph by eye to the nearest whole square.

✓ **Read carefully against the scale, and quote the accuracy the question expects.**

Examiners describe a standard statistics question as challenging purely because of the accuracy expected in reading the diagram.

统计图要读准

ER 2 sessions P5

6 · Probability & Statistics 2 概率与统计 2

✗ Approximating a binomial with another binomial, or approximating without checking the conditions.

✓ **Check n and p first: large n with small np goes to Poisson; large n with np and nq both over 5 goes to Normal.**

Examiners state that a binomial approximation gained no credit because it is not a suitable approximation, however correctly it was evaluated.

先判断该用哪种近似

ER 3 sessions P6

✗ Using a Normal approximation to a discrete distribution without a continuity correction.

✓ **Shift by 0.5: $P(X \geq 20)$ becomes $P(Y > 19.5)$.**

Examiners describe the best solutions as recognising the continuity correction explicitly; omitting it changes the answer.

离散近似要加连续性校正

ER 3 sessions P6

- ✗ Reaching for the formula without sketching the Normal curve.
- ✓ **Sketch it and shade the region – the sketch tells you whether z should be positive or negative.**

Examiners note good solutions used a sketch to identify the magnitude and sign of the expected z -value.

先画正态曲线草图 ER 2 sessions P6

- ✗ Summing three monthly means and forgetting to scale the variance the same way.
- ✓ **For a total over three months, add the means and add the variances; for three times ONE month, multiply the mean by 3 and the variance by 9.**

The two cases look alike and give different answers; examiners set out the correct handling of each.

分清是相加还是乘倍数 ER Jun23 P62

- State the distribution you are using, with its parameters, before you use it – for example $Po(0.025)$.
Examiners look for the justification, not just the arithmetic.

先写清分布与参数 ER Nov24 P62