IGCSE Mathematics

Most marks lost on this paper are lost to working that was never written down, or to an answer given to the wrong accuracy. Everything below comes from Cambridge's own examiner reports. The × line is what candidates do; the ✓ line is what scores. ,× ,✓

Working, accuracy and reading the question

✗ Writing only the final answer in the answer space.

✓ **Show the formula, the substitution and the calculation, then the answer.**

Named in six separate reports: with no working, a candidate who makes one slip usually scores nothing at all instead of the method marks.

ER 6 sessions P2

✗ Rounding a value to 3 significant figures in the middle of a longer method.

✓ **Keep intermediate values to at least four significant figures, and round only the final answer.**

Examiners state this in six reports. Rounding early moves the final answer outside the accepted range.

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ER 6 sessions P2

✗ Giving an answer that is impossible for the context – a negative length, or a probability above 1.

✓ **Check the answer is sensible, and in the form the question asked for.**

Examiners tell candidates to check both, because an obviously wrong value is usually a visible slip.

ER 2 sessions P4

✗ Skipping a topic because it was not on the last paper.

✓ **Cover the whole syllabus. Formulae have to be recalled, not looked up.**

The single most repeated key message across 13 sessions: success requires the complete syllabus and the formulae from memory.

ER 13 sessions P4

■ Read the instruction words: 'give an exact answer', 'leave in terms of π', 'correct to 2 decimal places'. Examiners raise instructions and key words in five separate reports.

ER 5 sessions P1

1 · Number

✗ Writing $2 \times 10^6 \times 100$ as 201×10^6 or 2×10^8.

✓ **Put the number back into standard form: $a \times 10^n$ with $1 \le a < 10$.**

All three of those wrong forms are recorded as common errors in the same question.

$1 \le a < 10$

ER 2 sessions P2

✗ Giving the bounds of 37.84 as $37 \le h < 38$ or $37.79 \le h < 37.89$.

✓ **Half a unit of the last digit each way: $37.835 \le h < 37.845$.**

Examiners record bounds as challenging with few correct answers, and list exactly these wrong forms.

ER 2 sessions P4

✗ Evaluating 2^5 as 10, or 4^{-2} as -16.

✓ **An index is repeated multiplication; a negative index is a reciprocal.**

Examiners list 16, 64 and 10 as the common wrong answers arising from 2×5.

ER 3 sessions P2

2 · Algebra and graphs

✗ Simplifying $y^3 \times y^5$ to y^{15}, or $(y^3)^5$ to y^8.

✓ **Multiplying adds the indices; a power of a power multiplies them.**

Examiners list y^2, y^8, y^{15} and $y^{0.6}$ as the common incorrect answers to one index question.

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ER 2 sessions P2

✗ Substituting $x = -2$ into a quadratic and squaring the minus sign away.

✓ $(-2)^2 = +4$**, and** $-2^2 = -4$**. Use brackets when you substitute.**

Examiners name this as the common error in completing a table of values, which then ruins the graph drawn from it.

ER 3 sessions P4

✗ Expanding three brackets by expanding all three at once.

✓ **Expand the first pair, tidy up, then multiply the result by the third bracket term by term.**

Examiners note candidates expanding the first pair correctly and then making errors combining it with the third.

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ER 2 sessions P2

✗ Joining plotted points with straight lines, or drawing a flat top between two equal values.

✓ **Draw a single smooth curve through the points, and let it turn between them.**

Examiners record candidates joining $(2, -8)$ and $(3, -8)$ with a horizontal line, which misses the true minimum.

ER 2 sessions P4

✗ Solving an equation from a graph by reading where the curve crosses the x-axis, whatever the equation is.

✓ **Rearrange the equation so one side matches the plotted curve, then draw the line the**

other side gives.

Examiners describe this as challenging, with only the strongest candidates determining which line to draw.

, ER 2 sessions P4

✗ Giving the line of symmetry of a parabola as 2.5, or as $y = 2.5$.

✓ **It is a vertical line: $x = 2.5$.**

Examiners list 2.5, $x = 2$, $x = 3$ and $y = 2.5$ among the common errors here.

x = ER 3 sessions P4

2 · Algebra and graphs

✗ Finding an inverse function and leaving the answer in terms of y.

✓ **Rearrange, then swap the letter: write $f^{-1}(x) = \ldots$ in terms of x.**

Examiners list leaving it in y, sign errors when rearranging, and ambiguous final answers as the common faults.

x ER 2 sessions P4

✗ Rearranging $y = mx + c$ for x as $my + c$ or $(y + c)/m$.

✓ $x = \dfrac{y - c}{m}$ **– subtract first, then divide the WHOLE side.**

All three wrong forms are recorded together as common errors in one rearrangement question.

, ER Jun23 P22

3 · Coordinate geometry

✗ Finding a gradient by subtracting the coordinates in a different order top and bottom.

✓ $m = \dfrac{y_2 - y_1}{x_2 - x_1}$**, with the same point first in both.**

Examiners name inconsistent subtraction, and dividing the wrong way round, as the common errors in finding the equation of a line.

ER 2 sessions P4

✗ Drawing $x = 6$ when the question asked for $y = 6$.

✓ $x = 6$ **is vertical;** $y = 6$ **is horizontal.**

Recorded as a common error in a graph question, where everything else was correct.

x = ER 2 sessions P4

4 · Geometry

✗ Answering an isosceles-triangle angle question with 42, or with $(180 - 42 - 42) \div 2$.

✓ **Decide first which angles are equal, then subtract from 180 once.**

Both are listed as the common incorrect answers to the same question – the second divides when it should not.

ER 3 sessions P2

5 · Mensuration

✗ Measuring a length on a scale drawing and giving the measurement as the answer.

✓ **Multiply by the scale: a 7.2 cm line at 1 : 50 is 360 cm.**

Examiners record candidates who measured accurately and then did not apply the scale at all.

ER 2 sessions P4

7 · Transformations and vectors

✗ Identifying a transformation as an enlargement and stopping.

✓ **Give all three parts: enlargement, scale factor 2, centre** $(1, 3)$**.**

The most repeated question-level finding in this subject, across six sessions: the type is recognised, the components are not.

ER 6 sessions P4

✗ Naming a rotation without its angle, direction and centre.

✓ **Rotation, 90° anticlockwise, about the origin – all three, every time.**

Examiners repeat the same finding for rotations across four sessions.

: ER 4 sessions P4

✗ Drawing a translation with only one component of the vector applied, or with both reversed.

✓ $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ **means 3 right and 2 DOWN. Count both, then check the direction.**

Examiners record exactly these errors – one component right, or the directions reversed – in two separate sessions.

ER 2 sessions P4

6 · Trigonometry

✗ Measuring a bearing anticlockwise, or from the wrong end of the line.

✓ **Measure clockwise from NORTH at the point you are standing, and give three figures: 067°.**

Examiners record 67°, 113°, 157° and 293° as the frequent wrong answers to one bearing question.

, ER 2 sessions P4

8 · Probability

✗ Writing a probability as '2 out of 5'.

✓ **Write it as a fraction, decimal or percentage: $\frac{2}{5}$, 0.4 or 40%.**

Examiners state that answers in words were not accepted, even though the reasoning was right.

ER Jun24 P22

✗ Giving the probability of the wrong outcome – the black ball when the question asked about the white one.

✓ **Reread which event the question names before writing the fraction.**

Named as the most common error in a question almost everyone could otherwise do.

ER Nov23 P12

9 · Statistics

✗ Giving the mode as the largest frequency instead of the value that has it.

✓ **The mode is the DATA VALUE that occurs most often, not how often it occurs.**

Examiners list the median, the largest number and the mean among the wrong answers to a mode question.

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ER 2 sessions P4

✗ Giving the median of a grouped table as the middle of the range.

✓ **Find the middle ITEM: the $\left(\frac{n+1}{2}\right)$th value in order.**

Examiners record 35 – the midpoint of the age range – as the most common incorrect answer, and some answers over 100 years old.

ER Jun24 P42

✗ Estimating the mean of grouped data from the class boundaries.

✓ **Use the MIDPOINT of each class, multiply by its frequency, and divide by the total frequency.**

Examiners record slips with a midpoint value, or with the division, in three separate sessions – the method is known, the detail is not.

ER 3 sessions P4

✗ Dividing by the number of classes instead of the total frequency.

✓ **Divide by $\sum f$, the total number of items.**

Named among the incorrect methods for the mean of grouped data.

ER 2 sessions P4

■ When reading a value from a graph, check the scale first. Misreading the scale is listed as a common error in three separate sessions.

ER 3 sessions P4

2 · Algebra and graphs

✗ Solving simultaneous equations by adding when the signs are the same.

✓ **Match the coefficients first, then decide: same sign, subtract; different sign, add.**

Examiners describe most candidates gaining some credit but the sign choice as the most common error.

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ER 4 sessions P4

✗ Transposing terms and losing a sign – reaching $4x = 11$ and then dividing wrongly.

✓ **Do one operation to both sides at a time and write each line out.**

Examiners note that candidates correctly reached the first step and then made the error in the division that followed.

ER 2 sessions P2