IB DP MATHS AI · EXAM SPECIAL · SL & HL · FROM THE NOV 2024 AND MAY 2025 SUBJECT REPORTS · ~11 MIN READ

IB Maths AI Exam Traps: Mistakes Examiners Flagged

The mistakes IB examiners flagged in the November 2024 and May 2025 Maths AI subject reports, grouped by topic, each with the fix, plus a last-week checklist.

Accuracy & rounding | Finance (TVM) | Models & functions | Voronoi & geometry | Statistics | Probability | Hypothesis tests | Calculus

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No tag = **SL and HL** HL ONLY HL students only FORMULA BOOKLET given in the exam

M1 A1 how marks are awarded highlight = comes up again and again HANDY worth memorising

Test yourself at the end

IN 30 SECONDS

- **Every trap below was named by IB examiners** in the Maths AI subject reports for November 2024 and May 2025 (all time zones, SL and HL).
- **AI is not "just the calculator".** The May 2025 HL report called it "a wake-up call": core algebra, interpretation and clear working decide the grade.
- **The biggest single loss is accuracy:** answers to 2 significant figures, ignoring "two decimal places" (even when it was in bold) and rounding in the middle of a question.

BY THE END YOU CAN

- Spot the most common ways IB Maths AI students lose marks.
- Replace each one with the habit examiners want to see.
- Use a last-week checklist before every paper.

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1 Accuracy and working

COMMON MISTAKE

2 s.f. answers. The November 2024 SL report is blunt: an unsupported final answer to lower accuracy than instructed gets **zero** marks, because it doesn't show a correct method or answer. **Fix:** write the unrounded value, then 3 s.f.

COMMON MISTAKE

Ignoring the stated accuracy. Money to 2 d.p., "nearest integer", "4 s.f.", "as a percentage" or "nearest minute": all were ignored in May 2025. **Fix:** underline them in reading time.

COMMON MISTAKE

Truncating instead of rounding. 24.28 read as 24.2, or 2.836 written as 2.83.

COMMON MISTAKE

Rounding in the middle. Rounding a normal probability to 0.0339 and then using it in a binomial calculation gave the wrong final answer. **Fix:** keep full GDC values until the end.

COMMON MISTAKE

Too many digits. Giving a distance as 13 865.42462 km (to the nearest cm!) was penalised in May 2025 HL. **Fix:** 3 s.f. unless the context needs more.

COMMON MISTAKE

"Used GDC" as working. Recording button presses is not working; neither is a bare answer. **Fix:** write the equation, the distribution, or the TVM values, then the answer.

COMMON MISTAKE

Degree/radian mode. AI SL trig is in degrees; a GDC that has been reset is usually in radians. HL radian questions done in degrees gave a flat-line graph with "no turning points".

COMMON MISTAKE

Coordinates when only x is asked for (and vice versa). "Write down the x-values" means two numbers, not two points.

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2 Finance (TVM solver)

COMMON MISTAKE

Compound interest formula when there are regular payments. If PMT ≠ 0, use the finance solver.

COMMON MISTAKE

Signs. PV and PMT must have opposite signs for a loan (money in vs money out).

COMMON MISTAKE

N in years instead of payments. A 5-year loan with monthly payments has N = 60, not 5.

COMMON MISTAKE

FV for a repaid loan. It is 0. Many students left it blank or used the loan amount.

COMMON MISTAKE

Early repayment. Find the balance still owed first (FV after the payments made), then answer the new question.

COMMON MISTAKE

Interest vs interest rate. "How much interest" is an amount of money: total paid − amount borrowed.

COMMON MISTAKE

P/Y and C/Y. "Quarterly" compounding means C/Y = 4. Check both values every time. See GDC guide for keystrokes.

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3 Models and functions

COMMON MISTAKE

Interpreting a gradient. "a = 0.362" is not an interpretation. **Fix:** "the population increases by 0.362 **million per year**". Refer to both variables and the units.

COMMON MISTAKE

Function notation. h(d) does not mean h × d, and $f^{-1}(x)$ is the inverse, not the derivative.

COMMON MISTAKE

Inverse functions in context. For $C^{-1}(1270)$, 1270 is the cost, so you're finding the distance that costs 1270.

COMMON MISTAKE

Ignoring the context. An answer below 8.5 m when the dolphin was given as still above the water at 8.5 m. **Fix:** ask "is this realistic?" before you move on.

COMMON MISTAKE

Piecewise models. Confusing < and ≤ at the boundary, or substituting a value outside the piece's domain.

COMMON MISTAKE

Sinusoidal models. The amplitude is (max − min)/2, not the max; the principal axis is a **horizontal line** y = d; the period is twice the time from a maximum to the next minimum, not 365 because the graph "looks like" a year.

COMMON MISTAKE

Time answers. 14.6 hours after midnight is 14:36. Convert decimal hours and give a clock time when asked.

COMMON MISTAKE

Sequences in context. Using n = 10 when the account starts at n = 0, and "complete years" means rounding **down**.

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4 Voronoi diagrams and geometry

COMMON MISTAKE

The boundary between two sites is the **perpendicular bisector** of the segment joining them, not the line through them.

COMMON MISTAKE

Midpoints as two numbers. Write the midpoint as a coordinate pair (4, 3).

COMMON MISTAKE

Calculating every distance when the Voronoi diagram already tells you the nearest site. Use the diagram.

COMMON MISTAKE

Coverage questions. "Is the whole region within 3 km?" needs an explicit comparison: 2.83 < 3, so yes.

COMMON MISTAKE

Area units. If 1 unit = 2.5 km, areas scale by **$2.5^2 = 6.25$**, not 2.5.

COMMON MISTAKE

Non-right triangles. Don't assume a right angle or an isosceles triangle. Use the cosine rule when the sine rule doesn't have enough information.

COMMON MISTAKE

Shortest distance from a point to a line is the **perpendicular** distance, not the distance to a midpoint or along an angle bisector.

COMMON MISTAKE

"AB" means the length, not the vector. About a third of HL students misread this in May 2025.

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5 Statistics

COMMON MISTAKE

Spearman's rank with labels. Sheepdogs A, B, C are names, not ranks. Rank the scores, and give tied values the mean of their ranks.

COMMON MISTAKE

Pearson's r to 2 s.f. r = 0.99 lost a mark; give 3 s.f. (0.993).

COMMON MISTAKE

Outliers. Use $Q_1 - 1.5 \times \text{IQR}$ and $Q_3 + 1.5 \times \text{IQR}$ (not the median), mark each outlier separately on the box plot, and end the whisker at the last value that isn't an outlier.

COMMON MISTAKE

Mean from a frequency table by hand. Slow and error-prone. Use 1-variable statistics with a frequency list; check whether you need σ_x or s_x.

COMMON MISTAKE

Extrapolation. A prediction outside the data range is unreliable, whatever the correlation coefficient. Checking the model at one point doesn't make it reliable.

COMMON MISTAKE

Sampling methods. Stratified, systematic, quota and convenience were confused in several reports. State a specific disadvantage, not just "biased".

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6 Probability and distributions

COMMON MISTAKE

Binomial conditions. Say them in context: a fixed number of trials, two outcomes, constant probability, independent trials.

COMMON MISTAKE

"At least 4". $P(X \geq 4) = 1 - P(X \leq 3)$, not $P(X \leq 4)$.

COMMON MISTAKE

The normal distribution is continuous. $P(X > 45)$ is not $P(X \geq 46)$.

COMMON MISTAKE

Discrete distributions. Don't assume all outcomes are equally likely, and don't use $E(X) = np$ unless X is binomial.

COMMON MISTAKE

Fair games. Fair means the expected **gain** (winnings − cost) is 0.

COMMON MISTAKE

Normal sketches. Bell-shaped, symmetric, labelled with the mean, the region shaded. invNorm gives the value to the **left** of the area.

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7 Hypothesis tests

COMMON MISTAKE

χ^2 hypotheses. "No relationship" or "doesn't influence" is wrong. Write: **H_0: A and B are independent.** H_1: they are not independent.

COMMON MISTAKE

Conclusions without context. "Reject H_0" alone loses the mark. Say what it means for the situation.

COMMON MISTAKE

Wrong comparison. Compare the p-value with the significance level, or χ^2_calc with the critical value. Don't compare a p-value with a critical value.

COMMON MISTAKE

Degrees of freedom. Contingency table: $(r - 1)(c - 1)$. Goodness of fit: categories − 1, minus 1 more for each parameter estimated from the data (HL).

COMMON MISTAKE

Expected frequencies below 5. Combine categories before testing.

COMMON MISTAKE

t-tests. Choose one-tailed or two-tailed from the wording of H_1 ("greater" vs "different"); state the assumptions (normal populations). See AI write-up templates.

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8 Calculus

COMMON MISTAKE

Derivatives of terms like $5/x^2$. Rewrite as $5x^{-2}$ first.

COMMON MISTAKE

"Increasing at x = 3.5". You must state that the gradient is **positive** there, not just give the number.

COMMON MISTAKE

The constant of integration. Find it from the context (for example V = 0 when w = 0) and include it.

COMMON MISTAKE

Maximum of a function vs maximum of its derivative. The optimum is where the derivative is 0, not where the derivative is largest.

COMMON MISTAKE

Trapezoidal rule brackets. $\frac{1}{2} \times h \times [(y_0 + y_n) + 2(y_1 + \ldots + y_{n-1})]$: the large bracket matters.

COMMON MISTAKE

Percentage error. Divide by the **exact** value; the approximate value goes in the numerator difference only.

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9 HL only HL

COMMON MISTAKE

Matrices. Order of multiplication in composite transformations; using the inverse matrix to reverse a transformation; reflection and rotation matrices skipped by some schools.

COMMON MISTAKE

Markov chains. $s_n = T^n s_0$ (not T^{n-1}); each column of T adds to 1; give the steady state as a **vector**, the eigenvector for $\lambda = 1$.

COMMON MISTAKE

Graph algorithms. Show the method for Prim's (order of edges, stop after n − 1 edges); don't confuse it with nearest neighbour; for the deleted vertex bound, add the **two** shortest edges.

COMMON MISTAKE

Adjacency matrices. Closed walks of length 4: add the diagonal of A^4; a zero entry in A^3 means no walk of length 3.

COMMON MISTAKE

Coupled and second-order DEs. Find eigenvectors in the form (1, k); write Euler steps with the question's variables, show the first step.

COMMON MISTAKE

Separation of variables. Missing the minus sign when integrating 1/(1 − P), and substituting L = 0 instead of $L = L_0$.

COMMON MISTAKE

Confidence intervals. Use t (not z) when σ is unknown; write the interval as $a < \mu < b$; s^2_{n-1} is in the formula booklet.

COMMON MISTAKE

Linear combinations. Var(X − Y) = Var(X) + Var(Y). Variances add even when you subtract.

COMMON MISTAKE

Sample means. $\bar{X} \sim N(\mu, \sigma^2/n)$; forgetting the √n.

COMMON MISTAKE

Type I and II errors. A Type I error rejects a true H_0; its probability is the actual significance level of the critical region.

COMMON MISTAKE

Hypotheses in words. HL reports prefer symbols: H_0: μ = 25, H_1: μ > 25, or H_0: ρ = 0.

10 Last-week checklist

- **Before each paper:** angle mode set (degrees for most SL trig); finance app found; lists cleared; spare batteries.
- **During:** about **1 minute per mark**; attempt every part; use the given answer to re-enter; write all GDC inputs.
- **Every answer:** stated accuracy; units; context in conclusions; a reality check.

LINKING QUESTION

For calculator steps see the GDC guide; for model answers to interpretation questions see AI write-up templates; for how much these marks are worth see the grade boundaries.

Test yourself — cover the answers first

QUICK CHECK

1. A loan lasts 4 years with monthly payments. What is N?
2. What is the boundary between two Voronoi sites?
3. 1 grid unit is 2 km. A cell is 7 square units. What is its area?
4. Write H_0 for a χ^2 test on gender and sport choice.
5. $X \sim N(50, 4^2)$. Is $P(X > 45)$ the same as $P(X \geq 46)$?
6. HL How do you find the variance of $X - Y$ for independent X and Y?

Show answers

1. 48
2. the perpendicular bisector of the segment joining them
3. 28 km²
4. gender and sport choice are independent
5. no; the normal distribution is continuous
6. Var(X) + Var(Y)

Stuck on a question?

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