IB DP MATHS AA · EXAM SPECIAL · AA AND AI · SL & HL · HOW EXAMINERS AWARD EVERY MARK · ~9 MIN READ

IB Maths Command Terms and Markscheme Codes (M1, A1, R1, AG, FT)

What every IB Maths command term asks for, and how examiners award marks: M1, A1, R1, AG, FT, implied marks, misreads, "hence" vs "hence or otherwise", accuracy and the presentation rules that cost students marks.

Command terms | Write down vs find | Show that | Hence | Justify & prove | M, A, R, AG marks | Follow through | Misreads

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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

- **The command term tells you how much to write.** "Write down" needs only the answer; "show that" needs every step; "justify" needs a reason. Misreading it loses marks even when the mathematics is right.
- **Markschemes split marks into types.** M marks reward a method, A marks a correct answer, R marks reasoning. A correct final answer without working doesn't automatically get full marks.
- **This note explains both,** in plain words, using the conventions of the IB Maths markschemes (AA and AI share them).

BY THE END YOU CAN

- Know what each command term requires.
- Understand M1, A1, R1, AG, FT and implied marks.
- Avoid the presentation habits that lose marks.

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1 Command terms

Short-answer terms

Command term	What it asks for	Working needed?
Write down	The answer, with little or no calculation	No; it is usually 1 mark
State	A value, fact or name	No
Find / Calculate / Determine	An answer, with the method that gets it	Yes
Solve	All the values that satisfy an equation or inequality	Yes, and check the domain
Estimate	An approximate value	Show what it is based on
Draw / Plot	An accurate diagram or graph, to scale	Points marked accurately
Sketch	The shape, with the key features labelled (intercepts, turning points, asymptotes, endpoints)	No scale needed; features are
Label	Names or values added to a diagram	No

Reasoning terms

Command term	What it asks for	How it is marked
Show that	Every step from the information given to the stated result	You must work towards the answer, not from it
Verify	Substitute a value and check that it works	Substitution is expected here (unlike "show that")
Prove	A complete, rigorous argument for all cases	Each step and the conclusion carry marks
Justify	A valid reason or evidence for your answer	Usually an R1 mark
Explain	Reasons or causes	One mark per valid point
Deduce	A conclusion that follows from earlier results	Use what you've just found
Hence	**Use the previous result** to answer	Other methods score **zero**
Hence or otherwise	The previous result is the intended route, but any correct method is fine	Full marks for any valid method
Interpret / Comment	What the result means in the context	Context and numbers both needed
Suggest	A sensible idea or explanation (more than one might be right)	Must be plausible and relevant

COMMON MISTAKE

Answering a "write down" question with a page of algebra. If it is worth 1 mark, the answer is either obvious or on your calculator.

"Show that" done right

- **Start from one side** (or from the given facts) and work to the other side. Finish with the given result as the last line.
- **Don't manipulate both sides at once.** Moving terms across an equation you're asked to prove is treated as assuming the result: AA markschemes typically cap this at the first method mark.
- **Don't substitute the answer to check it,** unless the command term is "verify".

WORKED EXAMPLE

Show that $(x + 3)^2 - (x - 3)^2 = 12x$.

1. LHS = $(x^2 + 6x + 9) - (x^2 - 6x + 9)$ [M1 expanding both]
2. $= x^2 + 6x + 9 - x^2 + 6x - 9$ **A1**
3. **$= 12x$ = RHS** **AG**

- **Numerical "show that":** give one more significant figure than the stated value. To show $x \approx 2.4$, write $x = 2.4495... \approx 2.4$.
- **Use it anyway.** Even if you couldn't show the result, use the given value in later parts; you can still earn those marks.

"Hence" done right

WORKED EXAMPLE

(a) Show that $x = 2$ is a root of $p(x) = x^3 - 3x^2 + 4$. (b) Hence factorise $p(x)$ fully.

1. (a) $p(2) = 8 - 12 + 4 = 0$ **A1**
2. (b) "Hence": use $x = 2$, so $(x - 2)$ is a factor **M1**
3. **$p(x) = (x - 2)(x^2 - x - 2) = (x - 2)^2(x + 1)$ [A1A1]**

COMMON MISTAKE

Ignoring "hence" and starting again from scratch. Even a correct answer then scores nothing, unless the question says "hence or otherwise".

2 How the marks work

Mark types

Code	Awarded for	Key rule
M	Attempting a correct **method** (e.g. substituting into the right formula)	A marks that follow usually need this M mark first
A	A correct **answer** or accurate working	No A without the M before it (M0 A1 is generally impossible)
R	Clear **reasoning** or justification	Often only available if earlier marks were earned
AG	The answer was **given** in the question	No mark for writing it; the marks come from the steps
(M1), (A1)	**Implied** marks, in brackets	Earned if a correct later answer implies the step
FT	**Follow through**	A wrong earlier answer used correctly later still scores

Rules worth knowing

- **A correct answer can lose marks without working.** Marks are awarded for what you write, and many A marks depend on a method being seen.
- **Implied marks rescue you on a GDC paper:** if the final answer is correct, bracketed marks for the steps are implied. On Paper 1 (no GDC) the working is expected.
- **Follow through needs working.** With a wrong value from part (a), you can still get full marks in part (b), but usually only if the examiner can see your method.
- **No follow through for impossible answers.** A probability above 1, $\sin\theta = 1.4$, or a non-integer where an integer is needed loses the answer mark.
- **No follow through after a failed "show that"** if you then use your own (wrong) value instead of the given one. Use the value printed in the question.
- **Misreads are penalised once.** If you copy a number wrongly from the question, you lose the first mark but can earn the rest.
- **Only the first answer is marked** if you give two. Crossed-out work isn't marked at all, so don't cross anything out until you have something better.
- **Correct, then wrong:** once a correct answer is seen, later wrong working is usually ignored, unless you use the wrong version in a later part.

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3 Accuracy and form

- **Exact or 3 s.f.:** unless the question says otherwise, give numerical answers exactly or to 3 significant figures.
- **Simplify what simplifies to an integer:** write 2, not 10/5. A fraction such as 10/4 is acceptable as long as top and bottom are integers.
- **Finish the arithmetic:** $4e^{2x} \times e^{3x}$ must become $4e^{5x}$. Factorising or expanding isn't required unless asked.
- **No calculator notation** in final answers: write 3.2×10^{-4}, not 3.2E−4.
- **Degrees or radians:** an answer in the wrong unit usually loses the final A mark.
- **Extra solutions:** a wrong extra answer (often outside the domain) can cost the final A1. Check each solution against the domain.

4 Habits from the markscheme notes

- **Line equations need "r =".** A vector equation written without r = typically loses a mark.
- **Probability in context:** write P(late | rain), not just P(A|B), to earn the method mark.
- **Induction:** "let n = k" or "n = k is true" isn't an assumption. Write "**assume** the statement is true for n = k".
- **Final reasoning marks need earlier marks.** In proofs, the concluding R1 is often only awarded if most previous marks were earned, so a lucky conclusion doesn't score.
- **Sketches:** put multiple curves on the same axes when asked; show intercepts, turning points and asymptotes with their values.
- **Transformations:** name the type, the direction and the factor or vector ("vertical stretch, scale factor 3"; "translation by the vector (2, 0)").

LINKING QUESTION

See these rules in action in the AA exam traps, the AI exam traps and the AI answer templates.

Test yourself — cover the answers first

QUICK CHECK

1. What does AG mean in a markscheme?
2. Can you get an A mark without the M mark before it?
3. What is the difference between "hence" and "hence or otherwise"?
4. Should you substitute the given answer in a "show that"?
5. You give two different answers to one part. Which is marked?
6. Is 3.2E−4 acceptable as a final answer?

Show answers

1. the answer is given in the question, so no mark is awarded for writing it
2. generally no
3. "hence" requires the previous result; "or otherwise" allows any valid method
4. no, only in a "verify" question
5. only the first
6. no; write 3.2×10^{-4}

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