A LEVEL MATHS 9709 · EXAM SPECIAL · AS & A LEVEL · ALL PAPERS · ~6 MIN READ

A Level Maths 9709: Exam Technique and the MF19 Formula List

How 9709 is examined: the paper routes, timings and marks, the accuracy rules (3 s.f., angles to 1 d.p.), what the MF19 formula list gives you and what you must learn, calculator rules, and the errors the examiner reports flag most.

Paper routes | Timings & marks | Accuracy rules | Exact answers | MF19: given formulae | Formulae to learn | Calculator rules | "Show that" questions

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Paper tag = **where it is examined** FORMULA LIST (MF19) given in the exam M1 A1 B1 how marks are awarded

highlight = comes up again and again HANDY worth memorising Test yourself at the end

IN 30 SECONDS

- **Two pure papers plus two applied papers** make the full A Level: Papers 1 and 3 (Pure), plus either Papers 4 and 5 (Mechanics + Probability & Statistics 1) or Papers 5 and 6 (both statistics papers).
- **Accuracy rule:** non-exact answers to 3 significant figures, angles in degrees to 1 decimal place, unless the question says otherwise. Keep more figures in working.
- **MF19 gives you many formulae,** but not the basics: the quadratic formula is there, but the equation of a circle, the arc length and sector area, and the laws of logs aren't. Learn those.
- **Working earns most of the marks.** A correct answer with no method can score nothing, especially in "show that" and "solve" questions.

BY THE END YOU CAN

- Know the structure, timing and weighting of each 9709 paper.
- Apply the accuracy rules and give exact answers when asked.
- Know exactly which formulae MF19 provides, and learn the rest.
- Avoid the errors the examiner reports flag every session.

Riyaz Sir

1 The papers

Routes and timings

Paper	Content	Time	Marks	Weight (A Level)
1	Pure Mathematics 1	1 h 50 min	75	30% (60% of AS)
2	Pure Mathematics 2 (AS only)	1 h 15 min	50	not used for A Level
3	Pure Mathematics 3	1 h 50 min	75	30%
4	Mechanics	1 h 15 min	50	20%
5	Probability & Statistics 1	1 h 15 min	50	20%
6	Probability & Statistics 2	1 h 15 min	50	20%

- **AS Level** is Paper 1 plus one of Papers 2, 4 or 5. **A Level** is Papers 1, 3, 4, 5 or Papers 1, 3, 5, 6. Paper 6 needs the Paper 5 content.
- **Timing:** roughly 1.4 minutes per mark on every paper. A 7-mark question deserves about 10 minutes; move on if you're stuck and come back.
- **Pure 3 assumes Pure 1.** Questions on Paper 3 freely use quadratics, coordinate geometry and Paper 1 trigonometry.

2 Accuracy and exact answers

The rules

- **3 significant figures** for non-exact answers; **1 decimal place** for angles in degrees. Answers given to fewer figures, or rounded from rounded values, lose the accuracy mark.
- **Keep at least 4 s.f. in working.** Early rounding is the commonest cause of a wrong final digit.
- **"Exact" means no decimals:** leave π, surds, e and ln in the answer, simplified (e.g. ½ ln 5, $(2e^3 + 1)/9$, π/8 + ¼).
- **Radians** are expected in calculus with trig. If an answer is an angle and the question is in radians, give radians.
- **"Show that" (AG):** the answer is given, so every step must be visible. Finish with a clear statement that matches the given result.

COMMON MISTAKE

Approximating midway through a "show that" or quoting the given answer without a full derivation. Both lose the final mark at least.

3 The MF19 formula list

Given or not?

Topic	Given in MF19	Learn yourself
Algebra	quadratic formula; AP and GP sums; binomial (integer and rational n)	factor and remainder theorems; discriminant; modulus rules; partial fraction forms
Trigonometry	$\sin^2 + \cos^2$ identities in reciprocal forms; addition and double-angle formulae	exact values of 30°, 45°, 60°; CAST; arc length $r\theta$; sector area $\frac{1}{2}r^2\theta$
Differentiation	table of derivatives including $\tan^{-1}x$; product and quotient rules; parametric dy/dx	tangent and normal equations; stationary point tests
Integration	standard integrals including $1/(x^2 + a^2)$, f'/f; by parts	area and volume of revolution set-ups; trapezium rule layout
Vectors	scalar product	vector equation of a line method; skew test
Mechanics	suvat equations	$F = ma$; $P = Fv$; momentum; $F \leq \mu R$; work–energy method
Statistics	mean, variance, binomial, geometric, Poisson, sample mean, linear combination formulae	conditions for each model; continuity corrections; hypothesis test structure

- **Normal tables** ($\Phi(z)$ and critical values) are printed in MF19, at the back.
- **Coordinate geometry isn't given:** gradient, midpoint, distance and the circle $(x - a)^2 + (y - b)^2 = r^2$ must be memorised.

COMMON MISTAKE

Looking up a formula during the exam and misreading it. Practise with MF19 beside you, so you know where everything is.

4 Calculators

What you may and may not do

- **Allowed:** scientific calculators are permitted on all 9709 papers (graphing calculators and those with symbolic algebra are not).
- **Solving equations:** you may use the calculator to solve a quadratic, but must show the method for anything that needs factorising (e.g. a cubic, via the factor theorem), and for any "show that" or "hence" question.
- **Integrals:** a numerical answer from the calculator scores nothing if the question asks you to integrate. Show the antiderivative and substitute the limits.
- **Degree/radian mode:** check it at the start of every trig question.

5 The traps examiners report most

Pure Mathematics

- **Not changing limits** in a substitution, and losing dx terms (2024 Paper 3).
- **Sign errors** in the quotient rule and in integration by parts ($uv - \int v\,du$).
- **Not adjusting the interval** when solving $\sin(\theta + \alpha) = k$, so a solution is missed.
- **Quadrant errors** for arguments of complex numbers; giving arguments in degrees.
- **Not rejecting** impossible roots ($e^x = -1$, ln of a negative, $\sin x = 2$).

Mechanics and statistics

- **$R \neq mg$** when other forces have vertical components; friction in the wrong direction.
- **Momentum signs** dropped for particles moving the other way.
- **Hypothesis-test conclusions** with no context, or stated as definite ("this proves").
- **Continuity corrections** missing, or in the wrong direction; σ^2 used as σ.
- **Var(X − Y) = Var(X) − Var(Y)**: variances never subtract.

LINKING QUESTION

Topic notes: Quadratics to Complex numbers for pure; Forces and equilibrium to Energy, work and power for mechanics; Representation of data to Hypothesis tests for statistics.

Test yourself — cover the answers first

QUICK CHECK

1. Give the accuracy rule for angles in degrees.
2. Is the equation of a circle given in MF19?
3. Is integration by parts given in MF19?
4. Which papers make up A Level with mechanics?
5. May you solve a cubic on your calculator without working?

Show answers

1. 1 decimal place
2. no
3. yes
4. 1, 3, 4 and 5
5. no, show the factorisation

Stuck on a question?

Send it to me on WhatsApp. I read every message.

Want regular help? Send this to your parent →

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