GCSE ONLINE TUTORING

IN PARTNERSHIP WITH RS REMOTE TUTORING

HIGHER MATHEMATICS

MASTER COURSE SPECIFICATION & REVISION REFERENCE

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Course at a glance

Course	Higher Mathematics - C847 76 / X847 76
Level	SCQF Level 6 (24 SCQF credit points)
Paper 1	55 marks | 1 h 15 min | non-calculator
Paper 2	65 marks | 1 h 30 min | calculator permitted
Overall	120 marks | grades A-D from combined total

Source basis: [SPEC]. Qualifications Scotland confirms that legacy SQA-branded documents remain current while they are progressively reissued. [COURSE]

How to use this reference

- Use each topic as a mastery checklist rather than a list of headings.
- For each topic, produce evidence: an accurate worked example, an unfamiliar problem, and a short explanation of the key condition or method.
- Paper 1 preparation should prioritise exact values, algebraic manipulation and non-calculator fluency. Paper 2 should add efficient calculator use without replacing mathematical reasoning.
- The question-paper brief indicates approximate overall emphasis of 30-45% algebra, 15-35% geometry and 15-40% calculus. [SPEC]

01. Factorising cubic and quartic polynomial expressions

Area: Algebra

Specification-aligned requirement: Use factor/remainder reasoning and valid polynomial division; communicate why a factor is established.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

02. Laws of logarithms and exponents

Area: Algebra

Specification-aligned requirement: Simplify numerical/algebraic expressions and keep equivalent lines mathematically consistent.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

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03. Addition and double-angle formulae

Area: Trigonometry

Specification-aligned requirement: Select and apply supplied identities accurately; combine them with exact values and algebra.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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04. Trigonometric identities

Area: Trigonometry

Specification-aligned requirement: Manipulate identities rigorously, including National 5 identities that remain assumed knowledge.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

05. Wave function

Area: Trigonometry

Specification-aligned requirement: Convert $a\cos x + b\sin x$ into $k\cos(x \pm a)$ or $k\sin(x \pm a)$, then use amplitude/period/phase information.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

06. Transformations of graphs

Area: Functions

Specification-aligned requirement: Apply kf(x), f(kx), f(x)+k and f(x+k), including multiple transformations and shape preservation.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

07. Derivative graphs

Area: Functions

Specification-aligned requirement: Sketch y=f'(x) from the behaviour and stationary points of y=f(x).

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

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08. Exponential/logarithmic inverse graphs

Area: Functions

Specification-aligned requirement: Recognise inverse relationships and reflected graph structure.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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09. Completing the square with non-unit x^2 coefficient

Area: Algebra

Specification-aligned requirement: Complete the square accurately and use it for graph/coordinate reasoning.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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10. Composite functions

Area: Functions

Specification-aligned requirement: Evaluate and form composites with algebraic, trig, log and exponential functions.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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11. Inverse functions, domain and range

Area: Functions

Specification-aligned requirement: Determine inverses with valid restrictions and communicate domain/range implications.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

12. Cubic and quartic equations

Area: Algebra

Specification-aligned requirement: Use factorisation/division and solve all real solutions demanded by the question.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

13. Discriminant conditions

Area: Algebra

Specification-aligned requirement: Translate nature-of-roots information into =0, >0 or <0 conditions and solve the resulting equation/inequality.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

14. Quadratic inequalities

Area: Algebra

Specification-aligned requirement: Find critical values and use sign/graph reasoning to identify the correct interval(s).

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

15. Logarithmic equations

Area: Logs/Exponentials

Specification-aligned requirement: Convert between logarithmic and exponential form and apply log laws without invalid cancellation.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

16. Exponential equations

Area: Logs/Exponentials

Specification-aligned requirement: Rearrange, take logs where appropriate and solve accurately.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

17. Power/exponential straight-line models

Area: Modelling

Specification-aligned requirement: Linearise y=ax^b or y=ab^x, extract constants and interpret them in context.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

18. Intersections of lines and curves

Area: Algebra/Geometry

Specification-aligned requirement: Form simultaneous equations, solve and report coordinate pairs.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

19. Trig equations in degrees/radians

Area: Trigonometry

Specification-aligned requirement: Use identities/wave form as needed and find every solution in the stated interval.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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20. 3D vector pathways

Area: Vectors

Specification-aligned requirement: Represent directed routes in 3 dimensions and simplify vector expressions.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

21. Collinearity and internal division

Area: Vectors

Specification-aligned requirement: Use scalar multiple/path conditions coherently; determine internal division points.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

22. Scalar product and angles

Area: Vectors

Specification-aligned requirement: Use both scalar-product forms and distinguish vector magnitude from components.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

23. Unit vectors i, j, k

Area: Vectors

Specification-aligned requirement: Express and determine unit vectors and vector magnitudes appropriately.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

24. Differentiate powers of x

Area: Calculus

Specification-aligned requirement: Simplify first where helpful; handle negative/fractional powers.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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25. Differentiate sin and cos

Area: Calculus

Specification-aligned requirement: Use radian-based derivatives and supplied standard derivatives.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

26. Chain rule

Area: Calculus

Specification-aligned requirement: Differentiate composite algebraic/trig functions with complete inner derivative.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

27. Tangent equations

Area: Calculus

Specification-aligned requirement: Find derivative, evaluate gradient at a point, then form a line equation.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

28. Increasing/decreasing intervals

Area: Calculus

Specification-aligned requirement: State and solve $f'(x)>0$ or $f'(x)<0$ as appropriate.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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29. Stationary points and graph sketching

Area: Calculus

Specification-aligned requirement: Find coordinates, classify nature and combine with intercept/end behaviour.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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30. Integrate powers of x

Area: Calculus

Specification-aligned requirement: Integrate correctly, simplify coefficients and include +c for indefinite integrals.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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31. Integrate (px+q)^n

Area: Calculus

Specification-aligned requirement: Apply reverse-chain structure and coefficient factors accurately.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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32. Integrate p sin(qx+r), p cos(qx+r)

Area: Calculus

Specification-aligned requirement: Use supplied standard integrals with correct reciprocal factors.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

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Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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33. Differential equations dy/dx=f(x)

Area: Calculus

Specification-aligned requirement: Integrate, include constant, then use initial condition.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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34. Definite integrals

Area: Calculus

Specification-aligned requirement: Apply limits accurately, including radians, fractions and surds.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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35. Optimisation

Area: Calculus

Specification-aligned requirement: Model a quantity, differentiate, solve stationary conditions and justify the optimum.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

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36. Greatest/least values on a closed interval

Area: Calculus

Specification-aligned requirement: Check stationary points AND endpoints before concluding.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

37. Rate of change

Area: Calculus

Specification-aligned requirement: Interpret derivative as rate and solve contextual problems.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

38. Areas with integrals

Area: Calculus

Specification-aligned requirement: Set correct upper-lower integrand and treat area below the x-axis as positive geometric area.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

39. Parallel/perpendicular lines

Area: Geometry

Specification-aligned requirement: Use gradients and negative reciprocals; solve intersections.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

40. $m = \tan \theta$

Area: Geometry

Specification-aligned requirement: Use angle from positive x-axis and choose the correct orientation.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

41. Medians, altitudes and perpendicular bisectors

Area: Geometry

Specification-aligned requirement: Translate geometric definitions into line equations and intersections.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

42. Equation of a circle

Area: Circles

Specification-aligned requirement: Use both centre-radius and expanded forms.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

43. Tangency and intersections

Area: Circles

Specification-aligned requirement: Use radius-perpendicular-tangent property and solve line/circle or circle/circle intersections.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

44. Recurrence relations

Area: Sequences

Specification-aligned requirement: Form recurrence relations from contexts and generate terms.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

45. Limits of recurrence sequences

Area: Sequences

Specification-aligned requirement: Find and interpret a limit where it exists; explain non-existence when appropriate.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

46. Strategy selection

Area: Reasoning

Specification-aligned requirement: Identify which combination of algebra, geometry, trig or calculus is justified by the information.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

47. Mathematical communication

Area: Reasoning

Specification-aligned requirement: Use notation, brackets, equal signs, inequalities and conclusions consistently.

Secure performance looks like: You can choose the method without prompting, carry the algebra/notation consistently, identify any restrictions or interval conditions, and check the result against the structure of the problem.

Audit questions: Can I do this without a template? Can I explain why the method is valid? Can I complete it accurately under timed conditions? Can I recognise the same skill when embedded in a multi-step problem?

Evidence to retain: One clean worked solution; one error-corrected solution; one unseen timed question; a one-sentence rule or condition.

Primary source: [SPEC] Higher Mathematics Course Specification, skills/knowledge/understanding tables and course support notes.

Whole-course revision audit

Topic	Confidence	Last timed check	Repair action
Factorising cubic and quartic polynomial expressions	R / A / G	_____	_____
Laws of logarithms and exponents	R / A / G	_____	_____

Addition and double-angle formulae	R / A / G	_____	_____
Trigonometric identities	R / A / G	_____	_____
Wave function	R / A / G	_____	_____
Transformations of graphs	R / A / G	_____	_____
Derivative graphs	R / A / G	_____	_____
Exponential/logarithmic inverse graphs	R / A / G	_____	_____
Completing the square with non-unit x^2 coefficient	R / A / G	_____	_____
Composite functions	R / A / G	_____	_____
Inverse functions, domain and range	R / A / G	_____	_____
Cubic and quartic equations	R / A / G	_____	_____
Discriminant conditions	R / A / G	_____	_____
Quadratic inequalities	R / A / G	_____	_____
Logarithmic equations	R / A / G	_____	_____
Exponential equations	R / A / G	_____	_____
Power/exponential straight-line models	R / A / G	_____	_____
Intersections of lines and curves	R / A / G	_____	_____
Trig equations in degrees/radians	R / A / G	_____	_____
3D vector pathways	R / A / G	_____	_____
Collinearity and internal division	R / A / G	_____	_____
Scalar product and angles	R / A / G	_____	_____
Unit vectors i, j, k	R / A / G	_____	_____
Differentiate powers of x	R / A / G	_____	_____
Differentiate sin and cos	R / A / G	_____	_____
Chain rule	R / A / G	_____	_____
Tangent equations	R / A / G	_____	_____
Increasing/decreasing intervals	R / A / G	_____	_____

Stationary points and graph sketching	R / A / G	_____	_____
Integrate powers of x	R / A / G	_____	_____
Integrate (px+q)^n	R / A / G	_____	_____
Integrate p sin(qx+r), p cos(qx+r)	R / A / G	_____	_____
Differential equations dy/dx=f(x)	R / A / G	_____	_____
Definite integrals	R / A / G	_____	_____
Optimisation	R / A / G	_____	_____
Greatest/least values on a closed interval	R / A / G	_____	_____
Rate of change	R / A / G	_____	_____
Areas with integrals	R / A / G	_____	_____
Parallel/perpendicular lines	R / A / G	_____	_____
m = tan θ	R / A / G	_____	_____
Medians, altitudes and perpendicular bisectors	R / A / G	_____	_____
Equation of a circle	R / A / G	_____	_____
Tangency and intersections	R / A / G	_____	_____
Recurrence relations	R / A / G	_____	_____
Limits of recurrence sequences	R / A / G	_____	_____
Strategy selection	R / A / G	_____	_____
Mathematical communication	R / A / G	_____	_____

References and source notes

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