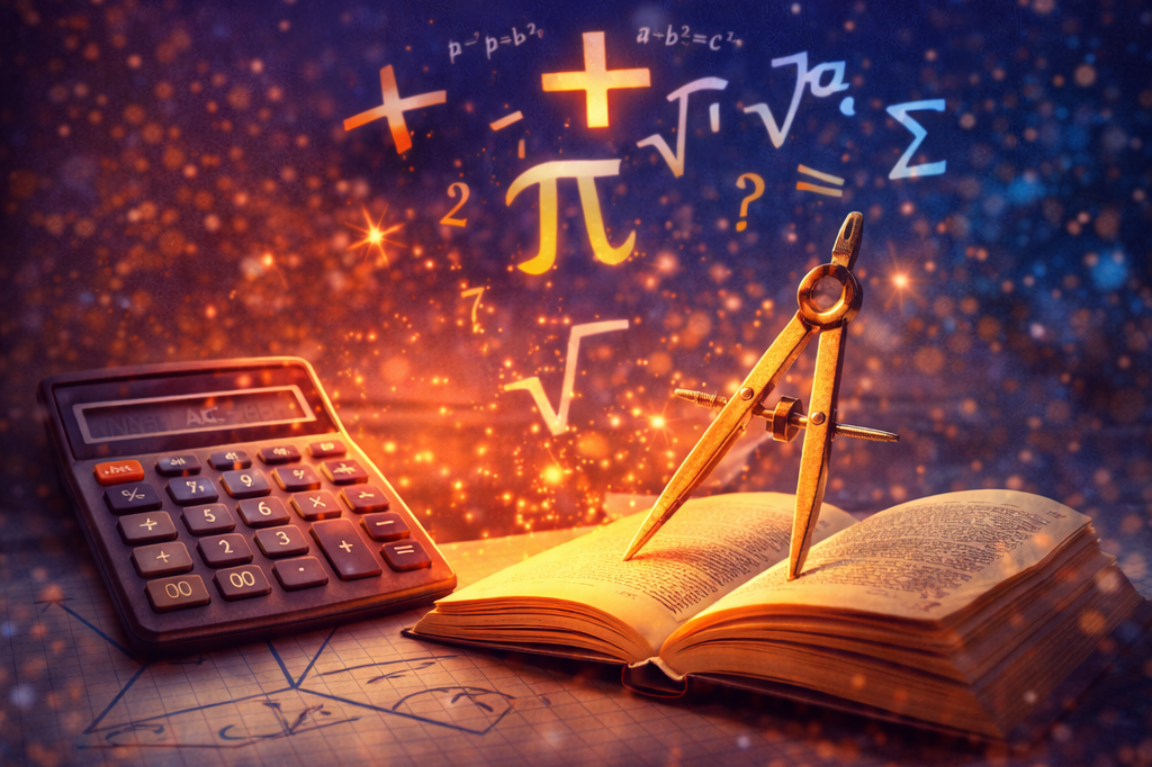
GCSE MATHEMATICS

100 AI PROMPTS

for Smarter Revision *and* Exam Prep

Active recall, exam technique, and mark-scheme thinking — without cheating.



by James R. Martin

This book is an independent educational resource and is not affiliated with, endorsed by, or approved by any examination board or awarding organisation.

The author has made use of artificial intelligence tools to assist with drafting, structuring, and generating example material. All educational guidance, explanations, and exam-related advice have been reviewed, edited, and curated by the author. Any resemblance to specific published materials is unintentional.

This book is intended to support revision and exam preparation. It does not replace formal teaching, textbooks, or official specifications. Students are responsible for ensuring that all work submitted for assessment is their own.

ISBN: 9798248107261

First published 2026

How to Use This Book

For a long time, high-quality tutoring has been a major contributor to elite academic achievement. Used well, AI can now act as a powerful tutor that most students and parents could not previously afford.

This book is a **starting point**, not a rulebook. Each prompt is designed to help you revise, test your understanding, and think more clearly — not to give perfect answers. You are encouraged to **adapt, improve, and remix** these prompts.

You are learning how to think carefully about the questions you ask — a skill that will matter far beyond these exams.

Note on Exam Boards and Syllabi

This book is designed to support GCSE Mathematics across all major UK exam boards, including AQA, Edexcel, and OCR.

Although specifications differ slightly in structure and question style, the core mathematical content remains consistent across exam boards. Students are expected to develop fluency in number, algebra, geometry, ratio, probability, statistics, and problem-solving.

Across all GCSE Mathematics specifications, marks are awarded for:

- Correct mathematical method
- Clear working and logical structure
- Accurate calculation
- Appropriate use of mathematical notation
- Correct interpretation of problem-solving questions

Unlike some subjects, GCSE Mathematics is highly method-dependent. Even when a final answer is incorrect, clear and correct working can earn method marks.

The prompts in this book focus on:

- Strengthening core mathematical fluency
- Developing step-by-step problem-solving structure
- Identifying and correcting common calculation errors
- Improving algebraic reasoning
- Interpreting worded problems accurately
- Practising exam-style thinking under time pressure

Students should always refer to their own specification and teacher guidance for exact topic weighting, formula sheet details, and tier-specific content (Foundation or Higher).

This book is designed to complement classroom teaching and official revision materials. It does not replace formal instruction or exam board specifications.

Contents

Section 9

Final Revision and Exam-Week Prompts

Section 1

Core Number and Arithmetic Fluency

Strong performance in GCSE Mathematics begins with numerical control.

Many higher-level mistakes are not caused by complex algebra or geometry. They are caused by weak foundations in number, arithmetic, and calculator accuracy.

This section strengthens the essential skills that underpin the entire course.

You will revisit:

- Place value and number sense
- Fractions, decimals, and percentages
- Factors, multiples, and prime numbers
- Indices and standard form
- Estimation and rounding
- Mental arithmetic strategies
- Calculator discipline

In GCSE Mathematics, fluency matters.

You must be able to:

- Convert confidently between fractions, decimals, and percentages
- Perform calculations accurately without unnecessary hesitation
- Estimate answers to check reasonableness
- Apply index laws correctly
- Use a calculator efficiently and responsibly

Many students rush through number work because it appears simple. However, small arithmetic errors can cost multiple marks in later multi-step questions.

This section focuses on precision and control.

When working through these prompts:

- Write calculations clearly.
- Check answers using estimation.
- Include units where appropriate.
- Identify where errors occur.

If your number skills are secure, algebra becomes easier, ratio problems become clearer, and geometry calculations become more manageable.

Do not underestimate this section.

Mathematical confidence is built on reliable foundations.

Take your time.
Work carefully.
Aim for accuracy over speed.

Prompt 1: Fraction–Decimal–Percentage Fluency

Copy this prompt into your AI tool:

Give me values in fraction, decimal, and percentage form. Ask me to convert each into the other two forms. Include recurring decimals and improper fractions.

What this helps you practise:
Rapid and accurate number conversion.

How to use it well:
Show working for recurring decimals.

Prompt 2: Order of Operations Discipline

Copy this prompt into your AI tool:

Give me calculations involving brackets, indices, multiplication, division, addition, and subtraction. Ask me to show full working and identify where mistakes commonly occur.

What this helps you practise:
BIDMAS accuracy.

How to use it well:
Do not skip intermediate steps.

Prompt 3: Prime Factors and Indices

Copy this prompt into your AI tool:

Give me numbers and ask me to write them as a product of prime factors in index form. Then ask me to use those factors to find HCF or LCM.

What this helps you practise:
Prime factorisation structure.

How to use it well:
Use index notation correctly.

Prompt 4: Laws of Indices

Copy this prompt into your AI tool:

Give me expressions involving indices (including negative and fractional powers for Higher Tier). Ask me to simplify them step by step.

What this helps you practise:
Index law fluency.

How to use it well:
Write each index rule applied.

Prompt 5: Standard Form Accuracy

Copy this prompt into your AI tool:

Give me numbers to convert into and out of standard form. Include multiplication and division in standard form.

What this helps you practise:
Place value precision.

How to use it well:
Ensure the first number is between 1 and 10.

Prompt 6: Estimation and Bounds

Copy this prompt into your AI tool:

Give me calculations and ask me to estimate the answer by rounding appropriately. Then ask me to compare my estimate with the exact value.

What this helps you practise:
Checking reasonableness.

How to use it well:
Round to sensible values before calculating.

Prompt 7: Calculator Discipline Check

Copy this prompt into your AI tool:

Give me multi-step calculations that require careful use of brackets on a calculator. After I answer, check whether rounding was applied correctly.

What this helps you practise:
Avoiding calculator errors.

How to use it well:
Write the full expression before entering it.

Prompt 8: Percentage Change

Copy this prompt into your AI tool:

Give me values and ask me to calculate percentage increase or decrease. Include decimal answers and ask for correct rounding.

What this helps you practise:
Percentage method control.

How to use it well:
Write the percentage change formula before calculating.

Prompt 9: Reverse Percentages

Copy this prompt into your AI tool:

Give me final values after percentage change. Ask me to find the original value using reverse percentage methods.

What this helps you practise:
Understanding multiplicative structure.

How to use it well:
Use multiplier method clearly.

Prompt 10: Mixed Arithmetic Drill

Copy this prompt into your AI tool:

Test me across fractions, percentages, indices, standard form, and estimation in random order. Require full working for each question.

What this helps you practise:
Switching confidently between number skills.

How to use it well:
Work slowly and neatly.

Prompt 11: Error Detection

Copy this prompt into your AI tool:

Provide a worked arithmetic solution that contains one mistake. Ask me to identify and correct the error.

What this helps you practise:
Spotting common GCSE calculation traps.

How to use it well:
Check every step logically.

Prompt 12: Section 1 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent number answers. Identify:

1. Recurring arithmetic mistakes
2. Weakness in estimation
3. Index or standard form confusion
4. One priority skill to strengthen

What this helps you practise:
Strategic improvement before moving on.

How to use it well:
Focus on your weakest area first.

Section 2

Ratio, Proportion, and Percentages

Ratio and proportion are about relationships between quantities.

Unlike basic arithmetic, these problems require you to think about how values change relative to one another.

Many GCSE students lose marks in this area because they:

- Memorise procedures without understanding why they work
- Confuse direct and inverse proportion
- Struggle with reverse percentages
- Misinterpret worded proportional problems
- Make avoidable calculator errors in compound growth

This section develops proportional reasoning step by step.

You will practise:

- Simplifying and interpreting ratios
- Sharing quantities in a given ratio
- Calculating unit rates and best buys
- Working with direct and inverse proportion
- Solving percentage increase and decrease problems
- Calculating reverse percentages
- Understanding compound growth and decay

Proportion is central to GCSE Mathematics.

It underpins:

- Similar shapes in geometry
- Speed, density, and other compound measures
- Graph interpretation

- Algebraic modelling
- Financial mathematics

When working through this section:

- Write each step clearly.
- Identify what changes and what stays constant.
- Check whether the relationship is direct or inverse.
- Estimate to confirm whether your answer is sensible.

Proportional reasoning is not about speed.
It is about structure.

If you can clearly identify relationships between quantities,
multi-step problems become significantly easier.

Take your time.
Think logically.
Let the method guide you.

Prompt 13: Simplifying Ratios

Copy this prompt into your AI tool:

Give me ratios to simplify, including three-term ratios and ratios involving decimals. Require me to show full working.

What this helps you practise:
Basic ratio structure and simplification.

How to use it well:
Divide all terms by the highest common factor.

Prompt 14: Sharing in a Given Ratio

Copy this prompt into your AI tool:

Give me total amounts and ratios. Ask me to divide the total into parts according to the ratio.

What this helps you practise:
Proportional division method.

How to use it well:
Find the total number of parts first.

Prompt 15: Unit Rate and Best Buy

Copy this prompt into your AI tool:

Give me pricing scenarios. Ask me to calculate the unit rate and determine the best value option, explaining my reasoning clearly.

What this helps you practise:
Comparing proportional costs.

How to use it well:
Convert to the same units before comparing.

Prompt 16: Direct Proportion Structure

Copy this prompt into your AI tool:

Give me direct proportion problems in both numerical and algebraic form. Ask me to show why the relationship is multiplicative.

What this helps you practise:
Understanding direct proportionality.

How to use it well:
Use the form $y = kx$ where appropriate.

Prompt 17: Inverse Proportion Reasoning

Copy this prompt into your AI tool:

Give me scenarios involving inverse proportion. Ask me to explain how one quantity changes when the other doubles or halves.

What this helps you practise:
Recognising inverse relationships.

How to use it well:
Check that the product remains constant.

Prompt 18: Percentage Increase and Decrease

Copy this prompt into your AI tool:

Give me real-world contexts requiring percentage increase or decrease. Ask me to show the multiplier method clearly.

What this helps you practise:
Multiplicative percentage reasoning.

How to use it well:
Write the multiplier before calculating.

Prompt 19: Reverse Percentage Problems

Copy this prompt into your AI tool:

Give me final values after percentage change. Ask me to find the original value using algebraic or multiplier methods.

What this helps you practise:
Reversing multiplicative change.

How to use it well:
Avoid subtracting percentages directly.

Prompt 20: Compound Growth and Decay

Copy this prompt into your AI tool:

Give me scenarios involving compound interest or repeated percentage change. Ask me to write and evaluate the full expression.

What this helps you practise:
Repeated multiplicative change.

How to use it well:
Use (multiplier)^number of periods.

Prompt 21: Proportion in Context

Copy this prompt into your AI tool:

Provide worded problems involving recipes, scaling shapes, or map scales. Ask me to structure the working clearly.

What this helps you practise:
Translating words into proportional reasoning.

How to use it well:
Identify the scaling factor first.

Prompt 22: Mixed Ratio and Percentage Drill

Copy this prompt into your AI tool:

Test me on ratio simplification, proportional division, percentage change, and compound growth in random order. Require full working for each question.

What this helps you practise:
Switching between proportional methods.

How to use it well:
Work methodically and label each step.

Prompt 23: Error Analysis — Proportion Trap

Copy this prompt into your AI tool:

Provide a worked proportional solution containing a common mistake (such as using additive reasoning instead of multiplicative). Ask me to identify and correct the error.

What this helps you practise:
Avoiding common GCSE misconceptions.

How to use it well:
Check whether the reasoning is multiplicative.

Prompt 24: Section 2 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent answers on ratio and percentage problems.
Identify:

1. Weakness in multiplier use
2. Confusion between direct and inverse proportion
3. Calculation errors
4. One priority area to improve

What this helps you practise:
Targeted refinement before algebra.

How to use it well:
Focus on structure over speed.

Section 3

Algebra Foundations and Manipulation

Algebra is the language of GCSE Mathematics.

Instead of working with specific numbers, you now work with symbols that represent numbers. This allows you to generalise patterns, solve unknowns, and model real-world problems.

Many students find algebra difficult because they treat it as a new subject rather than an extension of number skills.

In reality, algebra follows the same rules as arithmetic. The difference is that you must work carefully and logically at every step.

This section develops fluency in:

- Algebraic notation
- Simplifying expressions
- Expanding brackets
- Factorising expressions
- Substitution
- Rearranging formulae
- Working with indices
- Algebraic fractions (Higher Tier)

Success in algebra depends on structure.

When manipulating expressions:

- Work one step at a time.
- Keep both sides of an equation balanced.
- Avoid skipping logical steps.

- Check your final answer by substitution where possible.

Small algebra errors often come from rushing or combining unlike terms incorrectly.

Strong algebra students:

- Recognise patterns quickly.
- Maintain neat, organised working.
- Understand why each step is valid.

This section builds the symbolic fluency required for solving equations, interpreting graphs, and tackling higher-tier reasoning later in the course.

Do not aim for speed.

Aim for control.

Clear structure and disciplined working are the foundations of algebraic confidence.

Prompt 25: Simplifying Expressions

Copy this prompt into your AI tool:

Give me algebraic expressions involving like terms. Ask me to simplify them fully and explain why unlike terms cannot be combined.

What this helps you practise:
Basic algebraic structure.

How to use it well:
Group like terms clearly before simplifying.

Prompt 26: Expanding Single Brackets

Copy this prompt into your AI tool:

Give me expressions involving a single bracket. Ask me to expand and simplify step by step.

What this helps you practise:
Distributive law accuracy.

How to use it well:
Multiply every term inside the bracket.

Prompt 27: Expanding Double Brackets

Copy this prompt into your AI tool:

Give me pairs of binomials to expand. Ask me to show every multiplication step clearly.

What this helps you practise:
Structured expansion.

How to use it well:
Avoid skipping intermediate terms.

Prompt 28: Factorising Expressions

Copy this prompt into your AI tool:

Give me algebraic expressions to factorise, including common factor and simple quadratics (Higher Tier where appropriate).

What this helps you practise:
Reversing expansion.

How to use it well:
Check by expanding your final answer.

Prompt 29: Substitution Accuracy

Copy this prompt into your AI tool:

Give me algebraic expressions and numerical values. Ask me to substitute correctly, including negative numbers and powers.

What this helps you practise:
Careful substitution discipline.

How to use it well:
Use brackets around negative values.

Prompt 30: Rearranging Formulae

Copy this prompt into your AI tool:

Give me formulae to rearrange so that a different variable is the subject. Require full working.

What this helps you practise:
Maintaining equation balance.

How to use it well:
Perform the same operation on both sides.

Prompt 31: Algebraic Fractions (Higher Tier)

Copy this prompt into your AI tool:

Give me simple algebraic fractions to simplify. Ask me to state any restrictions on variable values.

What this helps you practise:
Recognising factors and cancelling correctly.

How to use it well:
Factorise before cancelling.

Prompt 32: Indices in Algebra

Copy this prompt into your AI tool:

Give me algebraic expressions involving index laws. Ask me to simplify step by step.

What this helps you practise:
Combining index rules with algebra.

How to use it well:
State which law you are using.

Prompt 33: Translating Words into Algebra

Copy this prompt into your AI tool:

Give me short worded statements and ask me to write algebraic expressions to represent them.

What this helps you practise:
Moving from language to symbols.

How to use it well:
Define variables clearly before writing expressions.

Prompt 34: Algebra in Context

Copy this prompt into your AI tool:

Provide simple real-world problems requiring algebraic setup before solving. Ask me to structure the solution clearly.

What this helps you practise:
Applying algebra to practical situations.

How to use it well:
Separate setup from solution steps.

Prompt 35: Multi-Step Simplification

Copy this prompt into your AI tool:

Give me expressions requiring expanding, simplifying, and factorising within one question.

What this helps you practise:
Switching between algebraic processes.

How to use it well:
Work line by line.

Prompt 36: Error Detection — Algebra Trap

Copy this prompt into your AI tool:

Provide a worked algebra solution containing a sign error or incorrect simplification. Ask me to identify and correct the mistake.

What this helps you practise:
Spotting common GCSE algebra errors.

How to use it well:
Check each transformation logically.

Prompt 37: Pattern Recognition

Copy this prompt into your AI tool:

Give me sequences of algebraic expressions. Ask me to identify patterns and predict the next term.

What this helps you practise:
Recognising structure in symbolic patterns.

How to use it well:
Look for consistent differences or factors.

Prompt 38: Algebraic Reasoning Challenge

Copy this prompt into your AI tool:

Ask me to explain why two algebraic expressions are equivalent using step-by-step reasoning.

What this helps you practise:
Understanding equivalence.

How to use it well:
Show transformation clearly.

Prompt 39: Mixed Algebra Drill

Copy this prompt into your AI tool:

Test me on simplifying, expanding, factorising, rearranging, and substitution in random order.

What this helps you practise:
Fluency across core algebra skills.

How to use it well:
Write clearly and avoid skipping steps.

Prompt 40: Section 3 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent algebra answers. Identify:

1. Sign errors
2. Incorrect combination of terms
3. Weakness in rearranging formulae
4. One priority algebra skill to strengthen

What this helps you practise:
Targeted algebra improvement.

How to use it well:
Focus on the weakest recurring error.

Section 4

Equations, Inequalities, and Graphs

In this section, algebra becomes purposeful.

Instead of simplifying expressions, you now use algebra to solve problems, model relationships, and interpret graphical information.

Equations allow you to find unknown values.
Inequalities allow you to describe ranges of possible values.
Graphs allow you to visualise relationships between variables.

These skills are central to GCSE Mathematics.

Students often lose marks in this section because they:

- Do not maintain balance when solving equations
- Make sign errors
- Forget to reverse inequality signs when multiplying or dividing by a negative number
- Misread graphs
- Fail to interpret what the solution represents in context

This section strengthens:

- Solving linear equations
- Solving simultaneous equations
- Solving quadratic equations (Higher Tier)
- Working with inequalities
- Plotting and interpreting linear and quadratic graphs
- Translating real-world problems into algebra

When solving equations:

- Keep both sides balanced at every step.

- Show each transformation clearly.
- Avoid skipping logical steps.

When interpreting graphs:

- Identify the variables.
- Check scales carefully.
- Distinguish between solving algebraically and solving graphically.

Graphs are not drawings — they are mathematical models.

Strong students use algebra and graphs together to confirm solutions and interpret meaning.

This section builds the connection between symbolic mathematics and real-world modelling.

Work methodically.
Check signs carefully.
Let logic guide each step.

Prompt 41: Solving Linear Equations

Copy this prompt into your AI tool:

Give me linear equations of increasing difficulty. Ask me to solve them step by step and explain how balance is maintained.

What this helps you practise:
Equation structure and logical steps.

How to use it well:
Perform the same operation on both sides.

Prompt 42: Equations with Brackets

Copy this prompt into your AI tool:

Give me equations that require expanding brackets before solving. Ask me to show full working.

What this helps you practise:
Combining expansion and solving.

How to use it well:
Expand carefully before simplifying.

Prompt 43: Simultaneous Equations

Copy this prompt into your AI tool:

Give me pairs of simultaneous equations. Ask me to solve using elimination or substitution and justify each step.

What this helps you practise:
Structured multi-step solving.

How to use it well:
Keep equations aligned clearly.

Prompt 44: Quadratic Equations (Higher Tier)

Copy this prompt into your AI tool:

Give me quadratic equations to solve by factorising or using the quadratic formula. Ask me to show all steps clearly.

What this helps you practise:
Higher-tier equation fluency.

How to use it well:
Check solutions by substitution.

Prompt 45: Solving Inequalities

Copy this prompt into your AI tool:

Give me linear inequalities to solve. Include at least one example requiring reversal of the inequality sign.

What this helps you practise:
Inequality discipline.

How to use it well:
Reverse the sign when multiplying or dividing by a negative.

Prompt 46: Graph Plotting

Copy this prompt into your AI tool:

Give me equations of straight lines. Ask me to create value tables and describe how the graph would look.

What this helps you practise:
Linking algebra to graphs.

How to use it well:
Choose sensible values for x.

Prompt 47: Interpreting Graphs

Copy this prompt into your AI tool:

Provide a graph and ask me to interpret gradients, intercepts, and solutions.

What this helps you practise:
Reading information from graphs.

How to use it well:
Check axis scales carefully.

Prompt 48: Quadratic Graph Interpretation

Copy this prompt into your AI tool:

Provide a quadratic graph. Ask me to identify roots, turning point, and symmetry.

What this helps you practise:
Visual understanding of quadratics.

How to use it well:
Describe features using correct terminology.

Prompt 49: Inequalities on Graphs

Copy this prompt into your AI tool:

Give me inequalities involving two variables. Ask me to describe the region represented graphically.

What this helps you practise:
Graphical interpretation of inequalities.

How to use it well:
State whether boundaries are solid or dashed.

Prompt 50: Algebraic Modelling

Copy this prompt into your AI tool:

Provide a real-world scenario. Ask me to form an equation, solve it, and interpret the solution in context.

What this helps you practise:
Translating words into algebra and back into meaning.

How to use it well:
Clearly define variables first.

Prompt 51: Equation vs Graph Comparison

Copy this prompt into your AI tool:

Give me an equation and its corresponding graph. Ask me to explain how the graph confirms the algebraic solution.

What this helps you practise:
Connecting algebra and geometry visually.

How to use it well:
Match solutions to x-intercepts.

Prompt 52: Gradient and Rate of Change

Copy this prompt into your AI tool:

Provide a linear graph. Ask me to calculate the gradient and interpret it in context.

What this helps you practise:
Understanding slope as rate of change.

How to use it well:
Use change in y over change in x.

Prompt 53: Error Detection — Equation Trap

Copy this prompt into your AI tool:

Provide a worked equation solution containing a sign error or imbalance. Ask me to identify and correct the mistake.

What this helps you practise:
Spotting solving errors.

How to use it well:
Check both sides of the equation carefully.

Prompt 54: Mixed Equation Drill

Copy this prompt into your AI tool:

Test me on linear equations, simultaneous equations, inequalities, and graph interpretation in random order.

What this helps you practise:
Switching between solving methods.

How to use it well:
Write full structured working.

Prompt 55: Multi-Step Modelling Challenge

Copy this prompt into your AI tool:

Provide a problem requiring equation setup, solving, and interpretation. Ask me to explain each stage clearly.

What this helps you practise:
Extended algebra reasoning.

How to use it well:
Separate setup from solving from interpretation.

Prompt 56: Section 4 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent answers. Identify:

1. Sign errors
2. Weak graph interpretation
3. Inequality mistakes
4. One solving skill to strengthen

What this helps you practise:
Targeted improvement before geometry.

How to use it well:
Correct recurring structural mistakes.

Section 5

Geometry and Measures

Geometry requires you to think visually and logically at the same time.

In this section, you will work with shapes, angles, lengths, areas, volumes, and transformations. Unlike algebra, where mistakes often come from manipulation errors, geometry mistakes often come from weak reasoning or misreading diagrams.

GCSE students commonly lose marks because they:

- Forget to justify angle reasoning
- Use incorrect formulae
- Confuse area and volume
- Misapply Pythagoras or trigonometry
- Ignore units
- Rely on what “looks right” instead of proving it

This section develops structured geometric thinking.

You will practise:

- Angle rules and geometric reasoning
- Perimeter, area, and volume calculations
- Circles and sectors
- Pythagoras’ Theorem
- Trigonometry
- Transformations and similarity

In geometry, method marks are often awarded for showing reasoning clearly. Writing “alternate angles” or “corresponding angles” explicitly can earn marks that a silent diagram cannot.

When working in this section:

- Draw diagrams carefully.
- Label values clearly.
- Write reasons for each step.
- Check that your answer matches the units required.

Trigonometry and similarity require proportional reasoning from earlier sections. If your ratio skills are secure, these topics become far more manageable.

Geometry is not about intuition.

It is about structured justification.

Work carefully.
State your reasons.
Let logic, not appearance, guide your conclusions.

Prompt 57: Angle Reasoning

Copy this prompt into your AI tool:

Provide diagrams involving parallel lines and triangles. Ask me to find missing angles and justify each step using correct geometric reasons.

What this helps you practise:
Structured angle justification.

How to use it well:
State the reason for every angle found.

Prompt 58: Polygon Angle Problems

Copy this prompt into your AI tool:

Give me problems involving interior and exterior angles of polygons. Ask me to show full working and explain any formula used.

What this helps you practise:
Understanding angle sum relationships.

How to use it well:
Write the formula before substituting values.

Prompt 59: Perimeter and Area

Copy this prompt into your AI tool:

Give me compound shapes. Ask me to calculate perimeter and area, clearly separating each stage of working.

What this helps you practise:
Breaking shapes into manageable parts.

How to use it well:
Check units carefully.

Prompt 60: Volume and Surface Area

Copy this prompt into your AI tool:

Provide 3D shapes, including compound solids. Ask me to calculate volume or surface area step by step.

What this helps you practise:
Structured multi-stage geometry calculations.

How to use it well:
Label intermediate values clearly.

Prompt 61: Circles and Sectors

Copy this prompt into your AI tool:

Give me problems involving circumference, area of a circle, and area of a sector. Require correct use of π and appropriate rounding.

What this helps you practise:
Circle formula accuracy.

How to use it well:
Keep π in calculations until the final step.

Prompt 62: Pythagoras' Theorem

Copy this prompt into your AI tool:

Provide right-angled triangles in different contexts. Ask me to identify the hypotenuse and apply Pythagoras correctly.

What this helps you practise:
Accurate theorem application.

How to use it well:
Square the correct sides.

Prompt 63: Trigonometry

Copy this prompt into your AI tool:

Give me right-angled triangle problems. Ask me to choose the correct trigonometric ratio and show full working.

What this helps you practise:
SOHCAHTOA selection and calculator discipline.

How to use it well:
Check that the calculator is in the correct mode.

Prompt 64: Similarity and Scale Factor

Copy this prompt into your AI tool:

Provide pairs of similar shapes. Ask me to calculate missing lengths, areas, or volumes using scale factors.

What this helps you practise:
Understanding linear, area, and volume scale relationships.

How to use it well:
Square or cube scale factors where required.

Prompt 65: Transformations

Copy this prompt into your AI tool:

Describe geometric transformations (reflection, rotation, translation, enlargement). Ask me to state the transformation fully and precisely.

What this helps you practise:
Precise geometric language.

How to use it well:
Include centre of rotation or enlargement where needed.

Prompt 66: Bearings and Coordinates

Copy this prompt into your AI tool:

Provide coordinate or bearing problems. Ask me to interpret diagrams and calculate missing angles or distances.

What this helps you practise:
Diagram interpretation and angle reasoning.

How to use it well:
Draw supporting lines if needed.

Prompt 67: Mixed Geometry Drill

Copy this prompt into your AI tool:

Test me on angle reasoning, area, volume, trigonometry, and similarity in random order.

What this helps you practise:
Switching confidently between geometric methods.

How to use it well:
Write clear working and include units.

Prompt 68: Justification Challenge

Copy this prompt into your AI tool:

Provide a geometry solution missing reasoning steps. Ask me to complete the justification clearly.

What this helps you practise:
Exam-style written reasoning.

How to use it well:
Use correct geometric terminology.

Prompt 69: Error Detection — Geometry Trap

Copy this prompt into your AI tool:

Provide a worked geometry solution containing a formula or unit error. Ask me to identify and correct the mistake.

What this helps you practise:
Spotting common GCSE geometry errors.

How to use it well:
Check formula choice and units carefully.

Prompt 70: Section 5 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent geometry answers. Identify:

1. Missing justifications
2. Formula misuse
3. Unit errors
4. One geometric skill to strengthen

What this helps you practise:
Targeted refinement before statistics.

How to use it well:
Focus on recurring weaknesses.

Section 6

Probability and Statistics

Probability and statistics require careful interpretation.

Unlike pure calculation topics, these areas test your ability to read information accurately, interpret data correctly, and justify conclusions logically.

Many GCSE students lose marks in this section because they:

- Misread scales on graphs
- Confuse frequency with probability
- Forget that probabilities must add to 1
- Misuse tree diagrams
- Interpret averages incorrectly
- Make assumptions without checking the data

This section strengthens both calculation and reasoning.

You will practise:

- Calculating mean, median, mode, and range
- Interpreting tables and statistical diagrams
- Constructing and analysing frequency diagrams
- Working with probability rules
- Using tree diagrams and Venn diagrams
- Interpreting data in context

In probability, structure matters.

Always:

- Identify the total number of possible outcomes.
- Check whether events are independent or dependent.
- Ensure probabilities are between 0 and 1.

In statistics, clarity matters.

- Label axes carefully.
- Check units.
- Interpret results in context rather than repeating numbers.

Examiners often reward interpretation rather than calculation alone. Being able to explain what a result means is as important as finding the result itself.

Do not rush.

Read carefully.
Check totals.
Think logically about what the numbers represent.

Prompt 71: Averages and Range

Copy this prompt into your AI tool:

Provide sets of data. Ask me to calculate the mean, median, mode, and range. Then ask me to interpret which average is most appropriate in context.

What this helps you practise:
Statistical calculation and interpretation.

How to use it well:
Write values in order before finding the median.

Prompt 72: Grouped Data Mean

Copy this prompt into your AI tool:

Provide grouped frequency tables. Ask me to calculate the estimated mean using midpoints and show full working.

What this helps you practise:
Structured grouped-data method.

How to use it well:
Multiply midpoint by frequency before summing.

Prompt 73: Histograms (Higher Tier)

Copy this prompt into your AI tool:

Provide class intervals with unequal widths. Ask me to calculate frequency density and interpret the histogram.

What this helps you practise:
Understanding frequency density.

How to use it well:
Use frequency ÷ class width.

Prompt 74: Interpreting Statistical Graphs

Copy this prompt into your AI tool:

Provide bar charts, pie charts, or cumulative frequency graphs. Ask me to extract information and interpret it in context.

What this helps you practise:
Careful graph reading.

How to use it well:
Check axis scales before answering.

Prompt 75: Basic Probability Rules

Copy this prompt into your AI tool:

Give me probability questions requiring addition and subtraction rules. Ask me to explain why probabilities must lie between 0 and 1.

What this helps you practise:
Core probability structure.

How to use it well:
Check that total probabilities sum correctly.

Prompt 76: Tree Diagrams

Copy this prompt into your AI tool:

Provide probability scenarios requiring tree diagrams. Ask me to calculate combined probabilities and show the multiplication clearly.

What this helps you practise:
Structured probability sequencing.

How to use it well:
Multiply along branches and add where required.

Prompt 77: Independent vs Dependent Events

Copy this prompt into your AI tool:

Provide probability scenarios. Ask me to determine whether events are independent or dependent and justify my reasoning.

What this helps you practise:
Conceptual probability understanding.

How to use it well:
Check whether previous outcomes affect later ones.

Prompt 78: Venn Diagrams

Copy this prompt into your AI tool:

Provide two- or three-set Venn diagram problems. Ask me to fill in missing regions and calculate required probabilities.

What this helps you practise:
Logical region reasoning.

How to use it well:
Start with the intersection.

Prompt 79: Mixed Data Interpretation Challenge

Copy this prompt into your AI tool:

Provide a real-world dataset involving averages and probability. Ask me to interpret the results and justify conclusions clearly.

What this helps you practise:
Combining statistical reasoning with context.

How to use it well:
Refer to specific values when explaining.

Prompt 80: Section 6 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent answers. Identify:

1. Graph-reading errors
2. Mistakes in probability structure
3. Weakness in grouped data method
4. One key statistical skill to improve

What this helps you practise:
Targeted refinement before multi-step problems.

How to use it well:
Focus on the weakest recurring mistake.

Section 7

Multi-Step Problem Solving

In GCSE Mathematics, the most demanding questions are rarely about a single skill.

Instead, they require you to combine number, ratio, algebra, geometry, or probability within one structured problem.

These questions test:

- Interpretation
- Planning
- Logical sequencing
- Accuracy across multiple steps

Students often lose marks here because they:

- Start calculating before understanding the problem
- Miss important information in the question
- Fail to structure their working
- Do not check whether the final answer is reasonable
- Panic when multiple topics appear together

This section develops structured problem-solving habits.

When approaching multi-step questions:

1. Read the entire problem carefully.
2. Identify what is being asked.
3. Highlight relevant information.
4. Decide which mathematical tools are needed.
5. Work methodically, one step at a time.
6. Check whether the final answer makes sense.

Strong problem solvers do not rely on instinct.
They rely on structure.

You will practise:

- Translating words into algebra
- Breaking large problems into smaller steps
- Connecting topics confidently
- Checking answers through estimation or substitution
- Identifying where marks are available

In longer GCSE questions, clear layout can earn marks even if the final answer is incorrect.

Organisation matters.

Clarity matters.

Logical sequencing matters.

This section strengthens your ability to stay calm and methodical when faced with unfamiliar or extended problems.

Take your time.
Plan your approach.
Let the structure guide you.

Prompt 81: Structured Word Problem

Copy this prompt into your AI tool:

Provide a multi-step GCSE word problem combining at least two topics (for example, ratio and algebra, or geometry and trigonometry). Ask me to structure my working clearly before calculating.

What this helps you practise:
Planning before solving.

How to use it well:
Write a short plan before starting calculations.

Prompt 82: Breaking Down a Complex Question

Copy this prompt into your AI tool:

Provide an extended problem. Ask me to break it into smaller steps before solving and explain why each step is necessary.

What this helps you practise:
Deconstructing large problems logically.

How to use it well:
Number each stage clearly.

Prompt 83: Translating Words into Algebra

Copy this prompt into your AI tool:

Provide a contextual problem. Ask me to define variables clearly, form equations, solve them, and interpret the solution.

What this helps you practise:
Full modelling process.

How to use it well:
Separate variable definition, equation setup, solving, and interpretation.

Prompt 84: Multi-Topic Integration

Copy this prompt into your AI tool:

Provide a problem that requires number work, algebra, and geometry within the same question. Ask me to explain how I identified which methods to use.

What this helps you practise:
Recognising method selection.

How to use it well:
State why each mathematical tool is appropriate.

Prompt 85: Reasonableness Check

Copy this prompt into your AI tool:

Provide a multi-step problem. After solving it, ask me to check whether the answer is sensible using estimation or substitution.

What this helps you practise:
Answer verification.

How to use it well:
Round values to estimate quickly.

Prompt 86: Mark Scheme Awareness

Copy this prompt into your AI tool:

Provide a 5–6 mark GCSE-style question. After I answer, respond as an examiner and identify where method marks would be awarded.

What this helps you practise:
Understanding mark allocation.

How to use it well:
Show every logical stage clearly.

Prompt 87: Error Analysis Challenge

Copy this prompt into your AI tool:

Provide a fully worked multi-step solution containing one structural mistake. Ask me to identify where the reasoning fails and correct it.

What this helps you practise:
Spotting breakdowns in logical flow.

How to use it well:
Check transitions between steps carefully.

Prompt 88: Section 7 Diagnostic Review

Copy this prompt into your AI tool:

Review my recent multi-step answers. Identify:

1. Planning weaknesses
2. Calculation slips
3. Poor interpretation
4. One structural habit to improve

What this helps you practise:
Strategic refinement before Higher Tier stretch.

How to use it well:
Focus on structure, not speed.

Section 8

Higher-Tier Reasoning and Algebraic Stretch

This section is designed to extend your mathematical thinking beyond standard procedures.

Higher-tier GCSE questions often require more than correct calculation. They require justification, reasoning, and proof.

In this section, you will encounter:

- Algebraic proof
- Iteration
- Functions and composite functions
- Quadratic graph reasoning
- Advanced ratio and proportional modelling
- Multi-step algebraic arguments

These topics test whether you understand why methods work, not just how to apply them.

Students often struggle here because they:

- Memorise procedures without understanding structure
- Avoid proof questions
- Rush through reasoning without clear explanation
- Fail to justify each step logically

When working in this section:

- Write full logical steps.
- Justify statements clearly.
- Avoid skipping reasoning.
- Check that each step follows from the previous one.

Algebraic proof, for example, is not about numbers. It is about showing that a statement is true for all valid values.

Iteration requires disciplined substitution and careful rounding.

Function questions require clarity about input and output relationships.

These topics reward patience and logical precision.

This section is not about speed.

It is about control and clarity.

Work carefully.
Justify fully.
Let logic lead every step.

Prompt 89: Algebraic Proof

Copy this prompt into your AI tool:

Provide a statement involving even and odd numbers (or algebraic expressions). Ask me to prove it algebraically step by step.

What this helps you practise:
Structured algebraic proof.

How to use it well:
Start by defining variables clearly.

Prompt 90: Proof of Divisibility

Copy this prompt into your AI tool:

Give me a statement about divisibility (for example, a number expression being a multiple of 3 or 5). Ask me to prove it using algebra.

What this helps you practise:
General proof reasoning.

How to use it well:
Factorise fully to show structure.

Prompt 91: Iteration Method

Copy this prompt into your AI tool:

Provide an equation that requires solving by iteration. Ask me to show each substitution clearly and round correctly.

What this helps you practise:
Careful repetitive substitution.

How to use it well:
Write each iteration step clearly.

Prompt 92: Functions and Composite Functions

Copy this prompt into your AI tool:

Provide two functions f(x) and g(x). Ask me to calculate fg(x), gf(x), and interpret the result.

What this helps you practise:
Understanding input–output structure.

How to use it well:
Substitute carefully.

Prompt 93: Quadratic Graph Reasoning

Copy this prompt into your AI tool:

Provide a quadratic expression and ask me to describe how changes to coefficients affect the graph.

What this helps you practise:
Linking algebra to graphical behaviour.

How to use it well:
Refer to roots and turning points clearly.

Prompt 94: Advanced Ratio Modelling

Copy this prompt into your AI tool:

Provide a complex proportional problem involving algebra. Ask me to set up equations and justify the modelling decisions.

What this helps you practise:
Combining ratio with algebraic reasoning.

How to use it well:
Define variables before forming equations.

Prompt 95: Multi-Step Higher-Tier Challenge

Copy this prompt into your AI tool:

Provide a challenging GCSE-style question combining algebra, geometry, and reasoning. Ask me to structure my answer clearly and justify each stage.

What this helps you practise:
Integrated higher-tier reasoning.

How to use it well:
Separate setup, calculation, and justification.

Prompt 96: Error Detection — Higher-Tier Trap

Copy this prompt into your AI tool:

Provide a worked higher-tier solution containing a reasoning flaw. Ask me to identify where the logic fails and correct it.

What this helps you practise:
Spotting structural reasoning errors.

How to use it well:
Check every algebraic transition.

Section 9

Final Revision and Exam-Week Prompts

In the final days before your GCSE Mathematics exam, your goal is not to relearn the entire course.

Your goal is to secure marks.

At this stage, success depends on:

- Accuracy
- Method
- Careful reading
- Clear working
- Avoiding avoidable mistakes

Many students lose marks in Mathematics not because they do not understand the topic, but because they:

- Misread the question
- Miss negative signs
- Forget units
- Skip logical steps
- Rush calculations
- Fail to check answers

This section is designed for short, focused revision sessions.

You will practise:

- Rapid topic recall across the full specification
- Structured calculation drills
- Mini exam-style question sets
- Identifying and correcting common mistakes
- Checking answers logically

In Mathematics, even small errors can cost multiple marks.

Before the exam, ensure that you can:

- Show clear working for every calculation
- Use correct mathematical notation
- Interpret worded problems carefully
- Check whether answers are reasonable
- Manage time calmly

Avoid last-minute cramming.

Instead:

- Review core methods.
- Practise a small number of mixed questions.
- Reflect on recurring mistakes.

Approach the exam methodically:

Read carefully.
Plan your steps.
Work clearly.
Check thoroughly.

If you have worked through this book carefully, your foundations are secure.

Confidence in Mathematics comes from structure and control.

Stay calm.
Trust your method.
Work logically.

Prompt 97: Rapid Whole-Spec Sweep

Copy this prompt into your AI tool:

Test me quickly across GCSE Mathematics topics including number, ratio, algebra, equations, geometry, and probability. Ask short questions in random order and identify any hesitation or weak areas.

What this helps you practise:
Checking overall coverage efficiently.

How to use it well:
Keep this session short and focused. Note weak topics immediately.

Prompt 98: Calculation and Accuracy Drill

Copy this prompt into your AI tool:

Give me four short questions:

1. A percentage or ratio calculation
2. An algebraic manipulation
3. A geometry calculation
4. A probability question

Set a short time limit and evaluate my working, rounding, and notation.

What this helps you practise:
Accuracy under light time pressure.

How to use it well:
Show full working even when questions feel simple.

Prompt 99: Mini Mock Simulation

Copy this prompt into your AI tool:

Create a short GCSE Mathematics mini-test including:

- One multi-step algebra question
- One geometry reasoning problem
- One data or probability interpretation task
- One higher-tier reasoning question (if appropriate)

After I answer, respond as an examiner and identify where marks are awarded.

What this helps you practise:
Handling mixed question types calmly.

How to use it well:
Attempt without notes.

Prompt 100: Final Readiness Check

Copy this prompt into your AI tool:

Ask me to summarise:

1. The key methods I must follow when solving equations
2. The most common mistakes to avoid in calculations
3. How to check whether an answer is reasonable

Then ask me one final structured question to confirm exam readiness.

What this helps you practise:
Entering the exam confident and organised.

How to use it well:
Keep answers concise and precise.

Final Closing Note

You have now worked through 100 prompts designed to help you think more clearly, revise more effectively, and prepare more confidently for your GCSE.

Remember: the goal was never to rely on AI for answers. The goal was to use it as a tool to test, challenge, and strengthen your own understanding.

The strongest students are not those who avoid difficulty, but those who engage with it deliberately. Each mistake you identified, each explanation you improved, and each gap you filled has strengthened your thinking.

As you continue your studies, aim to depend less on prompts and more on your own judgement. AI can support you — but your reasoning, clarity, and persistence are what earn marks.
Approach your exams calmly. Think carefully. Write clearly.
You are more prepared than you think.

Using AI Beyond This Book

The prompts in this book are starting points, not final forms.

As you grow more confident, begin modifying them:

- Add constraints (for example, “limit to three key points”).
- Increase difficulty gradually.
- Ask the AI to challenge your reasoning.
- Request alternative explanations.
- Ask it to critique your thinking rather than provide answers.

The most powerful use of AI is not asking it to tell you things — it is asking it to test and refine your thinking.

In the future, those who understand how to use tools intelligently will have an advantage. Treat AI as a tutor, not a shortcut. The skill of asking better questions will continue to matter long after your exams are over.

About the Author

James R. Martin holds an MSci in Physics from the University of Bristol and a PGCE with a Physics focus from the University of Oxford. He has over a decade of experience teaching and tutoring students aged 11–18 across a range of subjects, including Physics, Biology, Chemistry, Mathematics, Economics, and Electronics.

He has worked with multiple syllabi, including GCSE, A-Level, KS3, and the International Baccalaureate Diploma Programme (IBDP), supporting students of varying abilities to develop clarity, confidence, and exam success.

His work focuses on effective revision strategies, independent thinking, and the responsible use of artificial intelligence as a tool to strengthen — not replace — understanding.

Other Titles in This Series

The *100 AI Prompts for Smarter Revision* series supports students across GCSE, A-Level, and IBDP subjects.

GCSE
• English Language
• English Literature
• Mathematics
• Physics
• Biology
• Chemistry
• Geography
• History
• Computer Science
• Economics
• Business Studies
• Religious Studies
• Psychology
• French
• Spanish
• German

A-Level
• Mathematics
• Further Mathematics
• Physics
• Chemistry
• Biology
• Economics
• History
• Geography
• English Literature
• Psychology
• Computer Science

• Politics
• Business

IBDP

• Mathematics: Analysis & Approaches
• Mathematics: Applications & Interpretation
• Physics
• Chemistry
• Biology
• Economics
• Geography
• History
• English A: Literature
• English A: Language & Literature
• Psychology
• Business Management
• Computer Science