Richmond Tutoring

GCSE Maths topic checklist

Colour each box as you revise: **red** = can't do it yet, **amber** = getting there, **green** = confident. Revise the reds first. Topics marked H are Higher tier only.

Number

- Place value, ordering, negative numbers
- Four operations with integers, decimals and fractions
- Order of operations (BIDMAS)
- Factors, multiples, primes, HCF and LCM
- Prime factor decomposition
- Powers, roots and the laws of indices
- Fractional and negative indices H
- Standard form
- Surds: simplify and rationalise denominators H
- Fractions, decimals and percentages
- Recurring decimals to fractions H
- Rounding, significant figures, estimating
- Error intervals
- Upper and lower bounds in calculations H
- Counting strategies (systematic listing, product rule)

Ratio, proportion and rates of change

- Ratio: simplify, share in a ratio
- Direct and inverse proportion
- Proportion equations ($y = kx^2$, $y = k/x$) H
- Percentage change, reverse percentages
- Simple and compound interest, growth and decay
- Speed, density, pressure
- Converting units, including compound units
- Scale diagrams and maps
- Best buys and value for money

Algebra

- Notation, simplifying, substitution
- Expanding brackets and factorising
- Expanding and factorising quadratics
- Solving linear equations
- Rearranging formulae
- Linear inequalities and the number line
- Quadratic inequalities H
- Solving quadratics by factorising
- Quadratic formula and completing the square H
- Simultaneous equations (linear)
- Simultaneous equations: one linear, one quadratic H
- Algebraic fractions H
- Sequences: nth term of linear sequences
- nth term of quadratic sequences H
- Arithmetic, geometric and Fibonacci-type sequences
- Straight-line graphs, $y = mx + c$
- Parallel lines; perpendicular lines
- Quadratic, cubic and reciprocal graphs
- Exponential and trigonometric graphs H
- Transformations of graphs H
- Equation of a circle and its tangent H
- Real-life graphs (distance–time, speed)
- Gradients and areas under graphs H
- Functions: inverse and composite H
- Iteration H
- Show that / identities
- Algebraic proof H

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GCSE Maths topic checklist (continued)

Geometry and measures

- Angle rules, parallel lines, polygons
- Properties of 2D shapes and 3D solids
- Constructions and loci
- Bearings
- Perimeter and area, including circles
- Arcs and sectors
- Volume and surface area (prisms, cylinders)
- Spheres, cones and pyramids
- Pythagoras' theorem
- Trigonometry: SOHCAHTOA
- Exact trig values
- Sine rule, cosine rule, ½ab sin C H
- 3D Pythagoras and trigonometry H
- Transformations: reflect, rotate, translate, enlarge
- Enlargement with a negative scale factor H
- Congruence and similarity
- Similar shapes: area and volume H
- Circle theorems H
- Vectors: column vectors
- Vector proofs H
- Plans and elevations

Probability

- Probability scale, mutually exclusive events
- Relative frequency and expected outcomes
- Sample space diagrams
- Frequency trees
- Venn diagrams and set notation
- Tree diagrams (independent events)
- Conditional probability H

Statistics

- Averages and range
- Averages from frequency tables (including grouped)
- Charts: bar, pie, line, two-way tables
- Scatter graphs and correlation
- Time series
- Sampling and bias
- Cumulative frequency and box plots H
- Histograms with unequal class widths H

How to use it: after each past paper, mark the topics you dropped marks on as red. Our free GCSE Maths Check also gives you a topic list in 25 minutes: richmondtutoring.co.uk/tools/gcse-maths-check

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