GCSE Maths Higher - Topic Revision List

Number, Ratio and Algebra

- Addition, subtraction, multiplication and division
- Order of Operations (BIDMAS)
- Positive and Negative Numbers (adding, subtracting, multiplying, dividing)
- Decimals (adding, subtracting, multiplying and division)
- Multiples, factors, prime numbers, prime factors, product of prime factors, factor trees, LCM, HCF
- Rounding (whole numbers, decimal places, significant figures, estimation (including estimating square roots, truncation, error intervals (upper and lower bounds)
- Fractions (equivalent fractions (including simplifying), mixed number and improper, ordering fractions, adding and subtracting (including mixed number and improper), multiplying and dividing (including mixed number and improper)
- Converting fractions, decimals and percentages
- Ratios (simplifying ratios, recipes, using ratios, ratio of amount, ratio and fractions, proportions (including direct and inverse)
- Percentages (increase, decrease, simple interest, compound interest, compound growth, compound decay)
- Expressions (collecting like terms, multiplying variables, expanding brackets (single, double, triple), factorising (including quadratics), difference of two squares, simplifying algebraic fractions, adding and subtracting, multiplying and dividing algebraic fractions)
- Powers and roots (square numbers, cube numbers, roots, indices and index law, negative indices, fractional indices, standard form, adding and subtracting in standard form, adding, subtracting, multiplying and dividing surds, rationalising the denominator
- Formulas (writing formulas, substitution, rearranging, problem solving)
- Equations (solving equations (including single sided, double sided, with brackets and fractions), writing equations, iterative methods, recursive iteration, identities, solving quadratic equations by factorising, completing the square and solving quadratics through completing the square, quadratic formula, simultaneous equations)
- Inqualities (including quadratic inequalities, graphing inequalities, finding inequalities from graphs, linear programming)
- Sequences (term to term rules, shape sequences, nth term (including arithmetic sequences, geometric sequences, quadratic sequences, cubic sequences, arithmetic series)
- Straight line graphs (including gradients, equations of straight-line graphs, parallel and perpendicular lines, line segments (including midpoint, length of line, coordinates and ratio)
- Quadratic graphs (including sketching), cubic graphs, reciprocal graphs, exponential graphs, circle graphs, trigonometric graphs, transforming graphs (including translations, reflections, stretches)
- Interpretating and drawing real-life graphs, solving simultaneous and quadratic equations graphically, gradients of curves, tangents to a circle
- Functions (domain and range, composite functions, inverse functions)
- Differentiation (differentiating powers of x, finding gradients, maximum and minimum points, using differentiation, velocity and acceleration
- Matrices (addition, subtraction, multiplication (including by scalar), inverse matrices and determinants)
- Sets (notation, venn diagrams, unions, intersections, complement of a set,subsets)

Geometry and Measures

- Angles and 2D shapes - angles and lines, vertically opposite and alternate angles, corresponding angles and allied angles, triangles, quadrilaterals (squares, rectangles, parallelograms, rhombuses, kites and trapeziums), polygons (interior angles, exterior angles), symmetry
- Circle Geometry - circle theorems
- Units, Measuring and Estimating - converting metric units (length, mass, volume, area), metric and imperial units, estimating in real life
- Compound measures - speed, distance and time, density, pressure, distance-time graphs (including finding the speed), velocity-time graphs (including finding the acceleration and distance)
- Constructions - scale drawings, bearings, constructions (including constructing a perpendicular bisector, angle bisector, a perpendicular from a point to a line, constructing 90, 45, 60 and 30 degree angles, constructing parallel lines), loci
- Pythagoras and Trigonometry - Pythagoras' Theorem (including in 3D), trigonometry (sin, cos, tan, common trig values, sine and cosine rules, area, 3D trigonometry), Sin, Cos and Tan of larger angles (including obtuse and reflex angles)
- Vectors - vectors and scalars (including adding and subtracting vectors), magnitude of vectors, vector geometry
- Perimeter and area - triangles and quadrilaterals (including parallelograms and trapeziums), circles and sectors (including circumference, area, arcs and sectors of a circle)
- 3D shapes - plans, elevations and isometric drawings, volume (volume of a cuboid, prism), nets and surface area, spheres, cones and pyramids (volume, surface area), rates of flow, symmetry of 3D shapes
- Transformations - reflections, rotations, translations, enlargements, combinations of transformations, matrix transformations
- Congruence and similarity - congruent triangles, similar triangles, area of similar shapes, volumes of similar shapes

Statistics and Probability

- Collecting data - using different types of data, data collection sheets and questionnaires, two-way tables, sampling and bias, random sampling, stratified sampling, systematic sampling
- Averages and range - moving averages, averages for grouped data, interpreting data sets (including choosing the right average, measure of spread - interquartile range and percentiles)
- Displaying data - tables and charts (including two-way tables, bar charts, pie charts), stem and leaf diagrams (including back-to-back stem and leaf diagrams), frequency polygons, histograms (including interpreting), cumulative frequency diagrams, box plots, time series (including moving averages), scatter graphs (including correlation, lines of best fit), displaying data problems, misrepresentation of data
- Probability - calculating probability (including adding to 1), listing outcomes, product rule for counting outcomes, probability from experiments (including relative frequency, expected frequency, frequency trees, fair or biased), the AND rule for independent events, the OR rule (including for mutually exclusive events, the general OR rule), using the AND/OR rules, tree diagrams, conditional probability (including AND rule for dependent events, with venn diagrams)

PLEASE NOTE EVERY SECTION OF NUMBER, RATIO AND ALGEBRA, GEOMETRY AND MEASURES AND STATISTICS AND PROBABILITY INCLUDES WORD PROBLEMS AND CONTEXT QUESTIONS