GCSE Mathematics Higher Tier 1MA1

Summary Document

Year 10

Half term 1 – Algebra

1. **Algebraic manipulation**
   Simplifying expressions, expanding & factorising, substitution
2. **Forming and solving linear equations**
3. **Rearranging formulae**
4. **Quadratics**
   Expanding, factorising, forming & solving, sketching, graphical solutions, quadratic formula, completing the square
5. **Simultaneous equations**
   Forming and solving two linear simultaneous equations; one linear one non-linear simultaneous equations, graphical solutions

Half term 2 – Number

Assessment

1. **Percentages**
   Percentage increase, decrease, change, reverse percentages
2. **Growth and decay**
   Simple interest, compound interest, repeated percentage change
3. **Fractions, decimals, percentages**
   Conversions, all operations with fractions/decimals, recurring decimals to fractions
4. **Factors, multiples & primes**
   Product of prime factors, LCM/HCF
5. **Powers & roots**
   Index laws, negative and fractional indices
6. **Standard form**
   Conversions, calculations with standard form (multiplying, dividing, addition, subtraction)

Half term 3 – Statistics

1. **Sampling**
   Stratified sampling, capture-recapture
2. **Data presentation**
   Scatter diagrams, time-series graphs, two-way tables, stem & leaf diagrams
3. **Averages**
   Calculations from data sets, tables, reverse means
4. **Cumulative frequency diagrams & boxplots**
   Drawing, interpreting, understanding inter-quartile range
5. **Histograms**
   Index laws, negative and fractional indices
6. **Rounding, estimation & bounds**
   Calculations with bounds, error intervals

Half term 4 – Ratio & proportion, graphs

1. **Ratio & proportion**
   Simplifying, dividing in a ratio, scaling ratios (including map scales), writing ratios as fractions, combining ratios, subdividing ratios, currency conversions

Assessment

2. **Linear graphs**
   Draw & interpret linear graphs, calculate gradient & y-intercept, find the equation of a line, parallel lines, perpendicular lines, mid-points of lines & dividing lines into ratio
3. **Non-linear graphs**
   Recognise, sketch & interpret quadratics, cubic graphs, reciprocal graphs, circular graphs, exponential functions, graphical solutions to equations

Half term 5 – Shape & angles

1. **Area & perimeter**
   Rectangles, triangles, trapezia, parallelograms, circles, composite shapes
2. **Arcs & sectors**
   Areas of sectors, lengths of arcs, calculating missing angles, including in terms of pi
3. **Volume & surface area**
   Prisms (including cylinders), pyramids, spheres & cones, algebraic problems
4. **Angles in parallel line lines**
   Basic angle facts, angles in parallel lines, bearings
5. **Angles in polygons**
   Regular and irregular polygons, interior/exterior angles, tessellation

Half term 6 – Further shape & angles

1. **Transformations**
   Rotation, reflection, translation, enlargement (including negative and fractional scale factors), and combinations of these transformations

Mock Exams

2. **Circle theorems**
   Identify, apply and prove circle theorems
3. **Nets, plans & elevations**
   Draw front & side elevations, plans, use isometric grids, sketch 3D solids
4. **Maps and bearings**
   Use and interpret maps, scale drawings
5. **Congruency of triangles**
   Prove congruency of triangles using congruency proofs

Year 11

Half term 1 – Surds & trigonometry

1. **Surds**
   Simplifying expressions, expanding & factorising, rationalising denominators
2. **Algebraic fractions**
   Simplify, multiply, divide, add & subtract algebraic fractions
3. **Pythagoras' Theorem**
   Calculate missing side lengths; work with problems in 2D and 3D
4. **Right-angled trigonometry**
   Find missing side lengths and angles using SOHCAHTOA; work with problems in 2D and 3D; exact trigonometric values
5. **Non right-angled trigonometry**
   Sine rule, cosine rule, area of non-right angled triangles; sketch & interpret trigonometric graphs

Half term 2 – Probability, compound measures & proportion

1. **Probability**
   Experimental & theoretical probability, probability tree diagrams (including dependent events), Venn Diagrams, two way tables, product rule for counting
2. **Compound measures**
   Speed, distance, time problems; mass, density, volume problems; pressure, force, area problems; units of measure
3. **Real-life graphs**
   Compound measure graphs; tangents to curved graphs to estimate the gradient; area under a graph by using the trapezium rule
4. **Direct & inverse proportion**
   Statements of proportionality; setting up & solving direct and inverse proportion problems involving equations and constants of proportionality

Mock Exams

Half term 3 – Further algebra

1. **Functions**
   Function notation, inverse functions, composite functions
2. **Algebraic proof**
3. **Sequences**
   Arithmetic, geometric and quadratic sequences
4. **Iteration**
   Understand notation; find approximate solutions to equations
5. **Inequalities**
   Linear and quadratic inequalities; solution sets on number lines; graphical inequalities
6. **Similarity & congruence**
   Solve problems involving similar shapes; prove congruency of triangles; use linear/area/volume scale factors

Half term 4 onwards – Final topics + revision

1. **Vectors**
   Column notation, resultant vectors, dividing vectors in a given ratio, geometrical proofs
2. **Loci & construction**
   Perpendicular bisector (including from/at given point), angle bisector
3. **Transformations of graphs**
   Applying reflections and translations to linear, quadratic, cubic & trigonometric graphs