**GCSE Level 2 Further Mathematics**

**Exam Board: AQA**

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| **Term** | **INTENT** | **IMPLEMENTATION** | **IMPACT** |
| **Substantive Knowledge**  This is the specific, factual content for the topic, which should be connected into a careful sequence of learning. | **Disciplinary Knowledge (Skills)**  This is the action taken within a particular topic in order to gain substantive knowledge. | **Assessment opportunities**  What assessments will be used to measure student progress?  Evidence of how well students have learned the intended content. |
| **Year 10 Set 1**  **Spring Term**  **2B** | **Algebra** Simplifying and solving equations  Expanding brackets  Binomial expansion  Factorising and rearranging formulae  Simplifying and solving algebraic fractions  Completing the square  **Number**  Surds  Product Rule | * Expand and simplify brackets * Use Pascal’s triangle to work out the coefficient of xn term * Factorise expressions fully * Manipulate rational expressions * Manipulate formulaes * Knowledge and use of numbers and the number system including fractions, decimals, percentages, ratio, proportion and order of operations are expected * Work out how many 5-digit odd numbers can be formed using the digits 1 3 4 6 8 with no repetition of any digit * Operations of surds * Rationalise and simplify | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Year 10**  **Summer Term**  **3A** | **Algebra** Functions  Graphs of functions and linear equations  Equations of lines  Graphs of quadratics, exponentials and inverse functions  Graphs of functions with partial domains  Equation of a circle with centre (a,b)  Tangents of circles | * Notation f (x) will be used, e.g. f (x) = x2 – 9 * Domain may be expressed as, for example,x > 2, or ‘for all x, except x = 0’ and range may be expressed as f (x) > – 1 * The result of two or more functions, say f and g, acting in succession. fg (x) is g followed by f * The inverse function of f is written f-1 * Domains will be chosen for f to make f one-one * Graphs could be linear, quadratic, exponential and restricted to no more than 3 domains * Exponential graphs will be of the form y = abx and y = ab-x , where a and b are rational numbers * Sketch the graph of a quadratic * Solutions of quadratics to include solution by factorisation, by graph, by completing the square or by formula * Problems will be set in a variety of contexts, which result in the solution of linear or quadratic equations * Algebraic and graphical solution of simultaneous equations in two unknowns, where the equations could both be linear or one linear and one second order | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Year 10**  **Summer Term**  **3B** | **Geometry**  Circle Theorems  Trigonometry  Trigonometric Identities  Sine Rule  Cosine Rule  Lines and planes in three dimensions  **Algebra** Factor Theorem  Algebraic proof  Sequences  Simultaneous equations with three unknowns | * Understand and construct geometrical proofs using formal arguments * Sine and cosine rules in scalene triangles; area of a triangle = 0.5absinC * Use of Pythagoras’ theorem in 2D and 3D * Be able to apply trigonometry and Pythagoras’ theorem to 2 and 3 dimensional problems * Sketch and use graphs of y = sin x, y = cos x and y = tan x for angles of any size * Be able to use the definitions sin θ, cos θ and tan θ, for any positive angle up to 360°(measured in degrees only) * Knowledge and use of 30°, 60°, 90° triangles and 45°, 45°, 90° triangles * Know and use tanθ =sinθ /cos θ = and sin2θ=2sinθcosθ * Solution of simple trigonometric equations in given interval * Use of the factor theorem for rational values of the variable for polynomials * Completing the square * Drawing and sketching of functions Interpretation of graphs * Algebraic solution of linear equations in three unknowns | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments  Y10 End of Year Trial Exams |
| **Year 11 Autumn Term 1A** | **Calculus**  Differentiation  Tangents and Normals  Increasing and decreasing functions  Stationary Points  **Matrices**  Multipling matrices  Transformations  Identity Matrix and the unit square  Combining transformations | * Know that the gradient function dy/d x gives the gradient of the curve and measures the rate of change of y with respect to x * Know that the gradient of a function is the gradient of the tangent at that point * Differentiation of kxn where n is an integer, and the sum of such function * The equation of a tangent and normal at any point on a curve * Increasing and decreasing functions * Understand and use the notation d2y/dx2 * Use of differentiation to find maxima and minima points on a curve * Using calculus to find maxima and minima in simple problems * Sketch/ interpret a curve with known maximum and minimum points * Multiplication of matrices * The identity matrix **I** * Transformations of the unit square in the x – y plane * Combination of transformations | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments  Y11 Trial Exams |