Higher Maths – Course Plan

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| **Topic** | **Component Parts** |
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| 1. **Straight Line** | Gradients and Straight-Line Equations  Collinearity  Perpendicular Gradients  Medians of Triangles  Altitudes of Triangles  Perpendicular Bisectors  Distance Formula |
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| 1. **Sets and Functions** | Function Notation  Composite Functions  Inverse Functions  Graphs of Inverse Functions |
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| 1. **Graphs of Functions** | Graph Transformations |
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| 1. **Trig Graphs and Functions** | Drawing Trig Graphs  Transformations of Trig Graphs  Exact Value Triangles  Solving Trigonometric Equations  Compound Angle Equations |
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| 1. **Differentiation** | Differentiation in Two Notations  Rate of Change  Equations of Tangents  Increasing / Decreasing Functions  Stationary Points  Closed Intervals  Graphs of Derived Functions  Standard Functions  Optimisation |
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| 1. **Integration** | Definite and Indefinite Integrals  Rules of Integration  Standard Integrals  Area Under a Curve  Area Above and Below the X-Axis  Area Between Two Curves  Differential Equations |
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| 1. **Further Calculus** | Differentiation / Integration of and  Chain Rule  Integrating  Integrating and |
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| 1. **Quadratics** | Revision of Graph Sketching (N5)  Completing the Square  Discriminants of Quadratics with Variable Terms  Condition for Tangency |
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| 1. **Polynomials** | Synthetic Division  Finding Polynomial Coefficients  Solving Polynomial Equations  Curve Sketching |
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| 1. **Addition Formula** | Formula for  Formula for  Trigonometric Identities (N5)  Formulae Involving  Trigonometric Equations  Formulae for and |
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| 1. **Circle** | Equation of a Circle  The Equation of Circles with Centres at Origin  The Equation of Circles with Other Centres  The Equation of a Circle with Centre (a,b) and Radius r  The Expanded Form of a Circle Equation  The General Equation  Intersection of Circles and Straight Lines  Tangents  Equations of Tangents |
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| 1. **Exponentials and Logs** | Exponentials  Exponential Growth and Decay  Graphs of Exponentials  Laws of Logs  Logarithmic Equations  Natural Logs  Formulae from Experimental Data |
|  | Graphs of Exponential and Log Functions (from 3) |
| 1. **Wave Function** | Adding Two Waves  The Difference of Two Waves  Maximum and Minimum Values  Solving Equations |
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| 1. **Recurrence Relations** | Linear Recurrence Relations  Convergence and Divergence  Limits of Recurrence Relations  Solving Recurrence Relations to Find a and b  Special Sequences (Half Live etc.) |
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| 1. **Vectors** | Vectors and Magnitudes (N5)  Operations with Vectors (N5)  3D Coordinates and Vectors (N5)  Unit Vectors  Collinearity  Section Formula  The Scalar Product  Angles Between Vectors  Properties of the Scalar Product |