Higher Maths – Course Plan

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| **Topic** | **Component Parts** |
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| 1. **Straight Line**
 | Gradients and Straight-Line Equations$$m=tanθ$$CollinearityPerpendicular GradientsMedians of TrianglesAltitudes of TrianglesPerpendicular BisectorsDistance Formula |
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| 1. **Sets and Functions**
 | Function NotationComposite Functions Inverse FunctionsGraphs of Inverse Functions |
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| 1. **Graphs of Functions**
 | Graph Transformations |
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| 1. **Trig Graphs and Functions**
 | Drawing Trig GraphsTransformations of Trig GraphsExact Value TrianglesSolving Trigonometric EquationsCompound Angle Equations  |
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| 1. **Differentiation**
 | Differentiation in Two NotationsRate of ChangeEquations of TangentsIncreasing / Decreasing FunctionsStationary PointsClosed IntervalsGraphs of Derived Functions Standard FunctionsOptimisation |
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| 1. **Integration**
 | Definite and Indefinite IntegralsRules of IntegrationStandard IntegralsArea Under a CurveArea Above and Below the X-AxisArea Between Two CurvesDifferential Equations |
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| 1. **Further Calculus**
 | Differentiation / Integration of $sinx$ and $cosx$Chain RuleIntegrating $\left(ax+b\right)^{n}$Integrating $\sin(\left(ax+b\right))$ and $cos⁡(ax+b)$  |
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| 1. **Quadratics**
 | Revision of Graph Sketching (N5)Completing the SquareDiscriminants of Quadratics with Variable TermsCondition for Tangency |
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| 1. **Polynomials**
 | Synthetic Division Finding Polynomial CoefficientsSolving Polynomial EquationsCurve Sketching |
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| 1. **Addition Formula**
 | Formula for $sin⁡(A\pm B)$Formula for $cos⁡(A\pm B)$Trigonometric Identities (N5)Formulae Involving $2α$Trigonometric Equations Formulae for $sin^{2}x$ and $cos^{2}x$ |
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| 1. **Circle**
 | Equation of a Circle The Equation of Circles with Centres at OriginThe Equation of Circles with Other CentresThe Equation of a Circle with Centre (a,b) and Radius rThe Expanded Form of a Circle EquationThe General EquationIntersection of Circles and Straight LinesTangents Equations of Tangents |
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| 1. **Exponentials and Logs**
 | Exponentials Exponential Growth and DecayGraphs of ExponentialsLaws of LogsLogarithmic EquationsNatural LogsFormulae from Experimental Data |
|  | Graphs of Exponential and Log Functions (from 3) |
| 1. **Wave Function**
 | Adding Two WavesThe Difference of Two WavesMaximum and Minimum Values Solving Equations |
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| 1. **Recurrence Relations**
 | Linear Recurrence RelationsConvergence and DivergenceLimits of Recurrence RelationsSolving Recurrence Relations to Find a and bSpecial Sequences (Half Live etc.) |
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| 1. **Vectors**
 | Vectors and Magnitudes (N5)Operations with Vectors (N5)3D Coordinates and Vectors (N5)Unit VectorsCollinearitySection FormulaThe Scalar ProductAngles Between VectorsProperties of the Scalar Product |