ADVANCED HIGHER COURSE PLAN

TERM 1 August - October	**Partial Fractions**	Decomposing a rational function into a sum of partial fractions (denominator of degree at most three)
	Binomial Theorem	Expanding expressions using the binomial theorem
	Differential Calculus	Differentiating functions using the chain rule
		Differentiating functions given in the form of a product and in the form of a quotient
		Differentiating exponential and natural logarithmic functions
		Differentiating inverse trigonometric functions
		Finding the derivative where relationships are defined implicitly
		Finding the derivative where relationships are defined parametrically
		Applying differentiation to problems in context
	Functions	Finding the asymptotes to the graphs of rational functions
		Investigating features of graphs and sketching graphs of functions

TERM 2 October - December	Integral Calculus	Integrating expressions using standard results
		Integrating by substitution
		Integrating by parts
		Applying integration to problems in context
	ODE's	Solving first-order differential equations with variables separable
		Solving first-order linear differential equations using an integrating factor
		Solving second-order differential equations

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TERM 3 January - April	**Sequences**	Finding the general term and summing arithmetic and geometric progressions
		Applying summation formulae
		Using the Maclaurin expansion to find specified terms of the power series for simple functions
	Matrices	Using Gaussian elimination to solve a 3 ´ 3 system of linear equations
		Understanding and using matrix algebra
		Calculating the determinant of a matrix
		Finding the inverse of a matrix
		Using transformation matrices
	Vectors	Calculating a vector product
		Working with lines in three dimensions
		Working with planes

TERM 4 April - May	**Complex Numbers**	Performing algebraic operations on complex numbers
		Performing geometric operations on complex numbers
	Proof	Disproving a conjecture by providing a counterexample
		Using indirect or direct proof in straightforward examples
		Using proof by induction
		Using Euclid's algorithm to find the greatest common divisor of two positive integers