

Advanced Higher Mathematics Course Outline		St Thomas of Aquin's High School
Month	Topic	Website Links
June	Partial Fractions	Notes - Partial Fractions Examples – Partial Fractions
	Binomial Theorem including general term	Notes – Binomial Theorem Examples – Binomial Theorem
	Differentiation (chain, product, quotient, trig, exp & log, higher derivatives)	Notes – Differentiation Examples – Differentiation
Summer break		
Aug	Differentiation (first principles, inv trig, implicit, logarithmic, parametric, motion in a plane)	Notes – Further Differentiation Examples – Further Differentiation
Progress test		
Sept	Sequences & Series (inc. Maclaurin)	Notes – Sequences and Series Examples – Sequences and series Notes - Maclaurin Examples - Maclaurin
	Intro Proof - direct & induction	Notes/Examples – Methods of Proof
Oct	Integration (standard integrals, substitution, partial fractions - long div, inv trig, by parts)	Notes – Integration 1 Notes – Integration 2 Examples – Integration
	Differential equations (seperable, specific, 1st & 2nd order homogeneous)	Notes – First Order Differential Equations Examples – First Order Differential Equations
November Mini Prelim		
Nov	Graphing functions (asymptotes), odd/even functions, Modulus graphs, Inverse functions/graphs, non-stationary points of inflection	Notes – Functions and Graphs HSN – Functions Questions – Functions and Graphs
	Calculus in context (distance/speed/velocity), Volume of solid of revolution	Notes – Volume of Solid of Revolution (last few pages)
Intro Matrices and issue Matrices 1 & 2 as Homework		
Dec	Euclidian algorithm, Different bases	Notes – Number Theory
	Matrices (Gaussian elim, operations, determinants, inverses, transformations)	Notes – Matrices Notes – Transformation Matrices Examples – Matrices HSN – Matrices
	Vectors (3D straight lines, planes, vector product, intersection of planes)	Notes – Vectors (Lines) Notes – Vectors (Planes) Examples – Vectors
Christmas break		
Jan	Prelim Revision	Past Paper Practice
January Prelim		
Feb	Complex numbers (add, subtract, multiply, divide, modulus/argument, De Moivre's, roots, identities and Locus)	Notes – Complex Numbers Examples – Complex Numbers
	Proof (language, counter-example, various direct & indirect)	Notes/Examples – Methods of Proof
March	Differential equations (2nd order non-homogeneous), Mathematical models	HSN – Differential Equations Summary Notes
	Revision and preparation for exam	Past Paper Practice
Easter break		