Learning Programme – A-Level Mathematics – Upper Sixth

Topic/Teacher	Content/Objectives/Skills	Homework	Assessment	Success Criteria (A-Level grades)	Stretch & Challenge (Thirst for Learning)
	Michaelmas First Half Term				
Rational Functions (A)	Be able to add / subtract, multiply / divide algebraic fractions, and simplify them by cancelling down. Be able to split algebraic fractions (both normal and 'improper') into partial fractions, both by equating co-efficients and substitution. Be able to split algebraic fractions with repeated factors into partial fractions. Be able to perform algebraic division and use the 'degree' of the divisor and quotient to work out the 'degree' of the remainder.	Assessment Homework – Rational Functions		Determined from class work & homework may also be used.	Students will be challenged using extension questions on the topics they are studying, designed to develop their ability to solve multi-staged problems.
Functions (A)	Be able to state the domain and range of a function. Know and use function notation. Form and use composite functions. Be able to form the inverse of a function and show inverse functions graphically.				
Modulus Functions (A)	Understand what is meant by modulus and draw graphs of modulus functions. Understand and use the algebraic and geometric properties of modulus. Solve modulus equations and inequalities.				
Proof by Contradiction (A)	Be able to prove by contradiction the irrationality of √2 and the infinity of primes, and apply to other unfamiliar proofs.	Assessment Homework – Functions			
	Transforming Graphs				

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Michaelmas First Half Term					
Binomial Expansion (B)	Be able to use the Binomial Expansion to multiply $(1 + x)^n$ where n has negative or fraction powers. Be able to use the Binomial Expansion to multiply out expressions of the form $(a + bx)^n$ by writing in the form $a^n(1 + b/ax)^n$. Being able to identify the values of x for which the binomial expansion is valid. Understand how to use expansions to find approximations. Know how to extend the Binomial Expansion method to expand powers other expressions.	Assessment Homework – Binomial Expansion		Determined from class work & homework may also be used.	Students will be challenged using extension questions on the topics they are studying, designed to develop their ability to solve multi-staged problems.
Sequences (B)	Derive the terms of a sequence from both an nth term formula and recursive definition. Derive the nth term formula for an arithmetic sequence and find the sum of an arithmetic series. Understand and use sigma notation with arithmetic series.				
Sequences Geometric (B)	Identify geometric sequences and find the nth term of a geometric sequence. Find the sum of a geometric series and the sum to infinity of a convergent geometric series. Use sigma notation for geometric series.	Assessment Homework – Sequences			
Radians (B)	Convert between degrees & radians and vice versa. Draw graphs of trigonometric functions in radians. Calculate the length of an arc and the area of a sector using radians. Solving trigonometric equations using radians. Be able to use approximate trigonometric values when θ is small and measured in radians.				