

Learning Programme – A-Level Mathematics – Lower Sixth

Topic/Teacher	Content/Objectives/Skills	Homework	Assessment	Success Criteria (A-Level grades)	Stretch & Challenge (Thirst for Learning)
	Michaelmas Second Half Term				
Integration (A)	<p>Be able to integrate functions by reversing differentiation. Find indefinite integrals of polynomials and be aware of possible exceptions. Find the equation of a function from its derivative and a point on the curve. Evaluate definite integrals, using relevant notation (including using calculator functions). Use definite integration to find areas under curves. Evaluate improper integrals.</p>	Assessment Homework – Integration	Half Term Test (week after October half-term)	<p>Mainly determined from Half-Term test, however, class work & homework may also be used.</p> <p>A-Level Grade boundaries dependent on difficulty of test.</p>	Students will be challenged using extension questions on the topics they are studying, designed to develop their ability to solve multi-staged problems.
Graphs of curves (A)	<p>Be able to plot and sketch graphs (including their vertical and horizontal asymptotes) of quadratic, cubic, quartic, square root, reciprocal (both a/x and a/x^2) and exponential functions. Be able to use a graph to identify the roots of an equation and graph intersections to solve equations. Be able to interpret and use proportionality graphs.</p>				
Transformations of curves (A)	<p>Be able to use function notation and perform single transformations of the type $f(x) + a$, $f(x+a)$, $af(x)$, $f(ax)$, $-f(x)$, $f(-x)$ Be able to form and simplify equations following single transformations. Be able to use column vectors for translations.</p>				
Vectors (A)	<p>Be able to represent vectors using column vectors, components of unit vectors and vector algebra, in two dimensions. Calculate the magnitude and direction of a vector and convert between component form and magnitude/direction form. Add vectors diagrammatically and perform the algebraic operations of vector addition and multiplication by scalars, and understand their geometrical interpretations. Understand and use position vectors; calculate the distance between two points represented by position vectors. Use vectors to solve problems in pure mathematics and in context, (including forces).</p>				

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Binomial Theorem (B)	<p>Be able to understand and use the Binomial Theorem to expand $(x + y)^n$ for any positive integer value of n.</p> <p>Be able to determine the coefficient of a particular term in the expansion of $(x+y)^n$.</p> <p>Have an understanding of the different ways to determine coefficients; i.e. Pascal's triangle, and combinations, (i.e. ${}^n C_r$, button on a calculator, factorials and vector notation).</p> <p>Know that $0!$ is 1.</p>	<p>Assessment Homework – Factors & Binomial Expansion</p>			