Programme of Study – AS/A Pure Mathematics 3

	Theme	Overview of key learning to take place	How learning will be assessed
Term 2	Chapter7: Further algebra	**Chapter 7:Further algebra** 7.1 I can simplify rational expressions including factorising and cancelling, algebraic division. 7.2 I can find an appropriate form for expressing rational functions in partial fractions. 7.3 I can use the expansion of ((1 + x) ^n), where n is a rational number and |x| < 1. 7.4 I can use the expansion of ((a + x) ^n), where n is a rational number and |x| < 1. 7.5 I can carry out the decomposition, in cases where the denominator is no more complicated than ((ax + b) (cx + d) (ex + f)), ((ax + b) (cx + d) ^2), ((ax + b) (x^2 + c^2)), and where the degree of the numerator does not exceed that of the denominator.	**Examples of Formative Assessment to be used this term:** Question worksheets Exercise tasks **Summative assessment** Assessment to take place 2 times this term. Week 4 Online informal quiz Week 9- Mock Exam TBC Students will receive a mark for each assessment and personalised next steps for improvement
Term 2	Chapter 8 : Further Calculus	**Chapter 8 :Further Calculus** 8.1 I can extend the idea of 'reverse differentiation' to include the integration of (e^ {ax+b}), (dfrac {1} {ax +b}), (sin (ax + b)), (cos (ax + b)) and (sec^2 (ax + b)). 8.2 I can use trigonometrical relationships (such as double-angle formulae) to facilitate the integration of functions such as (cos^2 x). 8.3 I can integrate rational functions by means of decomposition into partial fractions. 8.4 I can recognise an integrand of the form (dfrac {kf' (x)} {f(x)}), and integrate, for example, (dfrac {x} {x^2 + 1}) or (tan x). 8.5 I can recognise when an integrand can usefully be regarded as a product and use integration by parts to integrate, for example, (x sin 2x, x^2 e^x) or (ln x).	

		8.6 I can Use a given substitution to simplify and evaluate either a definite or an indefinite integral.	
Term 2	Chapter 9 : Vectors	**Chapter 9 :Vectors** 9.1 I can Understand the significance of all the symbols used when the equation of a straight line is expressed in the form (r = a + tb). 9.2 I can determine whether two lines are parallel, intersect or are skew. 9.3 I can find the angle between two lines, and the point of intersection of two lines when it exists. 9.4 I can understand the significance of all the symbols used when the equation of a plane is expressed in either of the forms (ax + by + cz = d) or ((r - a).n = 0). 9.5 I can use equations of lines to solve problems concerning distances, angles and intersections, and in particular find the equation of a line given sufficient information. 9.6 I can find the line of intersection, find the perpendicular distance from a point to a line, and find the angle between two lines.	
Term 2	Chapter 10 : Differential equations	**Chapter 10 : Differential equations** 10.1 I can formulate a simple statement involving a rate of change as a differential equation, including the introduction if necessary of a constant of proportionality. 10.2 I can find by integration a general form of solution for a first order differential equation in which the variables are separable. 10.3 I can use an initial condition to find a particular solution.	
	Chapter 11 : Complex numbers	**Chapter 11 : Complex numbers** 11.1 I can understand the idea of a complex number, recall the meaning of the terms real part, imaginary part, modulus, argument, conjugate, and use the fact that two complex	

		numbers are equal if and only if both real and imaginary parts are equal. 11.2 I can carry out operations of addition, subtraction, multiplication and division of two complex numbers expressed in cartesian form x+iy. 11.3 I can understand in simple terms the geometrical effects of conjugating a complex number and of adding, subtracting, multiplying and dividing two complex numbers 11.4 I can use the result that, for a polynomial equation with real coefficients, any non-real roots occur in conjugate pairs. 11.5 I can represent complex numbers geometrically by means of an Argand diagram. 11.6 I can carry out operations of multiplication and division of two complex numbers expressed in polar form $r(\cos\theta+i\sin\theta)$ 11.7 I can find loci of complex numbers. 11.8 I can find the two square roots of a complex number.	