	Term 1	Term 2	Term 3
Unit Title	 Functions Differentiation Parametric Equations Integration Trigonometry Sequences & Series Algebra Proof Vectors 	 Differentiation applications & Implicit Differentiation. Differential Equations Kinematics Forces & Motion Moments Of Forces Revision & Mock Exams Projectiles Statistical Distributions Statistical Hypothesis Testing 	 A model for Friction Numerical Methods Revision for Exams
Approximate Number of Lessons	28 Double Lessons	24 Double Lessons	16 Double Lessons
Curriculum			
Content	 Terminology e.g. Range and domain, learn how to find composite & inverse functions. Modulus functions- graph & solve equations & inequalities involving these. Inverse Trig. Funtions. Extension of year 12 differentiation- differentiate trig. & log functions. Use chain, product & quotient rules. Learn what parametric equations are, sketch curves and differentiate parametric equations. Extension of year 12 integration- integrate trig. functions. Use of 	 Extension of turning points to include stationary & non-stationary points of inflection. Implicit differentiation & applications. Forming differential equations from rates of change problems. Solving first order differential equations using separation of variables. Numerical methods to solve equations: bisection method, decimal search, Newton-Raphson method & fixed point iteration. Trapezium rule for approximations to integrals. Variable acceleration for objects in 2 and 3 dimensions. Extend Year 12 forces and motion to include slopes and strings at angles. 	 Coulomb's model for friction and apply this to forces problems. Numerical methods to solve equations: bisection method, decimal search, Newton-Raphson method & fixed point iteration. Trapezium rule for approximations to integrals. Revision of all content covered in the 2 years and exam practice.

	 substitution and integration by parts. Further trig. Identities including compound and double angle formulae. Using these to solve further equations and prove more complex trig. Identities. Notation & terminology. Arithmetic & geometric series- find terms, sums of terms & sums to infinity where appropriate. Further binomial expansion with fractional and negative powers. Algebraic fractions, expressing fractions as the sum of partial fractions and using this to integrate further expressions and approximate using binomial expansion. Extension of proof from year 1 to include proof by contradiction. 	 Revision of all work covered in years 1 & 2 so far for mock exams. Projectile motion- use of constant acceleration formulae in 2 dimensions to solve a variety of problems. Discrete random variables- notation and diagrams. The Normal distribution- notation, calculating probabilities & approximating the binomial distribution. Learn how to carry out a Normal distribution hypothesis test and a PMCC test for correlation in bivariate data. 	
Links to prior earning	 Function notation and composite functions from GCSE. Year 12 differentiation-differentiate polynomials and use to find equations of tangents & normal to curves, find stationary points and their nature. Year 12 integration- integrate polynomial expressions both definite and indefinite. Use of 	 Calculus from year 12 and last term. Rates of change & forming expressions for these when given in words. Differentiation from year 1 and last term. Cartesian equations and sketching graphs. Use of calculus to solve variable acceleration problems in 1 dimension in year 1. 	 Forces, equilibrium, constant acceleration, connected objects and Newton's laws covered so far. Use of calculators for iterative formulae and use of trial & improvement methods to solve equations from GCSE maths. All content from the 2 year course.

	 integration to find areas between curves and the x-axis. Year 12 Trigonometry- trig. Identities including reciprocal trig.functions and solving trig. Equations in both degrees and radians. GCSE sequences and nth terms. Should be confident at +/-/x/÷ and simplifying fractions. Binomial expansion from year 12. Proof from year 1- proof by direct argument, proof by exhaustion and disproof by counter-example. Vectors in 2 dimensions from year 12 including magnitudes and finding vectors joining 2 points. 	 Newton's laws of motion, equilibrium, equations of motion & connected objects from year 1 Mechanics. All content from the course so far to be included in the mock exams. Constant acceleration formulae and acceleration due to gravity from year 1. Binomial Distribution and calculating probabilities from Year 1. Understand bivariate data and illustrating this using scatter diagrams. 	
Cultural Capital Opportunities	 Ritangle Competition in early December (problem solving): https://integralmaths.org/ritangle/ Book: The Man Who Knew Infinity by Robert Kanigel. Film: The Man Who Knew Infinity 	 Visit Bletchley Park Film: The Imitation Game Book: Things to Make and Do in the Fourth Dimension by Matt Parker. (Mrs Smith has a copy you can borrow). Book: Fermat's last Theorem by Simon Singh 	
Assessment Focus	Private Study: Topic quiz/testsChapter Assessments	 Private Study: Topic quiz/tests Chapter Assessments Mock Exams 	Private Study: Topic quiz/testsChapter Assessments

Mrs Mantle's Lessons (2.5 hours)

Unit	Chapter	Торіс	Weeks	Integral Link	Scheme of Learning Link
Pure	2	Trigonometry	2	<u>Trigonometry</u>	<u>Trigonometry</u>
		Autumn Term Year 13			
Pure	4	Functions Including Inverse Trig. Functions	4	<u>Functions</u>	Trigonometric Functions
Pure	Some of 5 & 9	Differentiation Rules	4	Differentiation	Differentiation
				Further differentiation	Further Differentiation
Pure	10	Integration	5	Integration	Integration
Pure	Some of 5 & 9	Differentiation Applications	1	Differentiation	Differentiation
				Further differentiation	Further Differentiation
		Spring Term Year 13	-		
Pure	Some of 5 & 9	Differentiation Applications & Implicit Differentiation	3	Differentiation	Differentiation
				Further differentiation	Further Differentiation
Pure	13	Differential Equations	2	Differential equations	Differential Equations
Revision		Revision & Mock Exams	2		
Statistics	16	Statistical Distributions	2	Statistical distributions	Probability Distributions
Statistics	17	Statistical Hypothesis Testing	3	Statistical hypothesis testi	r <u>Hypothesis Testing</u>
	Summer Term Year 13				
Pure	14	Numerical Methods	3	Numerical methods	Numerical Methods
	Pure		<u>Revision</u>		
	Comprehension		Comprehension		

Mrs Smith's Lessons (2.5 hours)

	Summer Term Year 12				
Unit	Chapter	Торіс	Weeks	Integral Link	Scheme Of Learning Link
Pure	6	Trigonometric Functions (Not Inverse Trig. Functions & Graphs)	3	Trigonometric functions	Trigonometric Identities
		Autumn Term Year 13			
Pure	8	Trigonometric Identities	4	Trigonometric identities	<u>Algebra</u>
Pure	3	Sequences and Series	3	Sequences and series	Sequences & Series
Pure	7	Algebra	3	<u>Algebra</u>	<u>Functions</u>
Pure	11	Parametric Equations	2	Parametric equations	Parametric Equations
Pure	1	Proof	1	<u>Proof</u>	<u>Proof</u>
Pure	12	Vectors	1	<u>Vectors</u>	<u>Vectors</u>
		Spring Term Year 13			
Mechanics	18	Kinematics	2	<u>Kinematics</u>	<u>Kinematics</u>
Mechanics	19	Forces & Motion	3	Forces and motion	Forces and Motion
Revision		Revision & Mock Exams	2		
Mechanics	20	Moments of Forces	2	Moments of forces	<u>Moments</u>
Mechanics	21	Projectiles	3	Projectiles	Projectiles
Mechanics	22	A Model For Friction	2	A model for friction	<u>Friction</u>
Statistics	15	Probability	2	<u>Probability</u>	<u>Probability</u>
	Mechanics		Mechanics Revision		
	Statistics		Statistics Revision		

Note: Integral is a subscription website so only students will be able to access links. Links are regularly updated so please ask your teacher.