

	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. Functions. • 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 learning	• 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 $+/-/x/\div$ 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/tests - Chapter Assessments	- Private Study: Topic quiz/tests - Chapter Assessments - Mock Exams	- Private Study: Topic quiz/tests - Chapter Assessments

Mrs Mantle's Lessons (2.5 hours)

Summer Term Year 12					
Unit	Chapter	Topic	Weeks	Integral Link	Scheme of Learning Link
Pure	2	Trigonometry	2	Trigonometry	Trigonometry
Autumn Term Year 13					
Pure	4	Functions Including Inverse Trig. Functions	4	Functions	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 testing	Hypothesis Testing
Summer Term Year 13					
Pure	14	Numerical Methods	3	Numerical methods	Numerical Methods
	Pure		Revision		
	Comprehension		Comprehension		

Mrs Smith's Lessons (2.5 hours)

Summer Term Year 12					
Unit	Chapter	Topic	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	Algebra
Pure	3	Sequences and Series	3	Sequences and series	Sequences & Series
Pure	7	Algebra	3	Algebra	Functions
Pure	11	Parametric Equations	2	Parametric equations	Parametric Equations
Pure	1	Proof	1	Proof	Proof
Pure	12	Vectors	1	Vectors	Vectors
Spring Term Year 13					
Mechanics	18	Kinematics	2	Kinematics	Kinematics
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	Moments
Mechanics	21	Projectiles	3	Projectiles	Projectiles
Summer Term Year 13					
Mechanics	22	A Model For Friction	2	A model for friction	Friction
Statistics	15	Probability	2	Probability	Probability
	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.