Year 12 A-Level Maths Overview 2023-24

	Term 1	Term 2	Term 3
Unit Title	• Problem Solving • Surds & indices • Data Handling • Algebra • Coordinate Geometry • Probability • Binomial Distribution & Hypothesis Testing.	• Polynomials • Graphs & Transformations • Calculus • Vectors • Kinematics • Forces & Newton's Laws of Motion	• Trigonometry • Exponentials & Logarithms • Variable Acceleration • Revision for Mock AS-Level Exams • Mock exams Start Year 13 Content from: To be decided once number of lessons known. • Trigonometry • Vectors • Kinematics • Functions • Probability
Approximate Number of Lessons	28 Double Lessons	24 Double Lessons	24 Double Lessons
Curriculum Content	• Introduction to problem solving which will be embedded in the course. • Understand and use of the laws of indices. Manipulate surds and rationalise denominators. • Data collection, processing, presentation and interpretation. • Solving equations and inequalities including linear and polynomials. Binomial expansion.	• Polynomials – factor theorem, polynomial division & sketching polynomial graphs. • Extending GCSE graphs and transformations- learning the rules using function notation. • Differentiation- first principles, rules, applying the rules to find equations of tangents & normal and stationary points & their nature. • Integration – reverse of differentiation and applying this to find areas under curves. • Learn the difference between scalar & vector quantities. Find magnitudes and	• Solving Trigonometric equations finding multiple solutions, sine and cosine rules for non-right angled triangles. Learn and use two trig. Identities. • Apply calculus to solve problems where s, v or a is given as a function of t and acceleration is not constant. • Learn what exponential and logarithmic functions are. Use both to solve exponential and logarithmic equations. Learn and apply the rules of logs. Learn and use the natural logarithmic function. Apply the above to modelling curves. • Revision of all work covered this year.

Year 12 A-Level Maths Overview 2023-24

	• Finding equations of circles and lines including parallel and perpendicular lines. • Finding probabilities using venn diagrams, two-way tables and tree diagrams. Recognising mutually and non-mutually exclusive events. • Learn about the Binomial distribution, calculate probabilities and use when a suitable model. Hypothesis testing- one and two-tail tests using p-values and critical regions.	directions of vectors. Convert between component and polar form. • Use of displacement-time, velocity-time and acceleration-time graphs. Use of constant acceleration formulae. • Know and apply Newton's 3 laws. Learn to draw force diagrams and find equations of motion for objects with acceleration and connected objects.	• Two AS-Level Mock exams: Paper 1: Pure & Mechanics (90 mins) Paper 2: Pure & Statistics (90 mins). Year 13 Content to be decided once number of lessons is known: • Learn what a radian is and solve trig. Equations using radians. Find arc lengths and areas of sectors & approximate trig. Functions for small angles. • Extends 2D vectors from Year 1 course to dealing with vectors in 3 dimensions. • Extending variable acceleration into 2 & 3 dimensions. • Graphing functions and transforming graphs. Finding composite and inverse functions. Graphing and solving equations involving a modulus function. • Year 1 variable acceleration in 1 dimension extended into 2 dimensions. • Conditional probability using formula, venn diagram, tree diagram or two-way table.
Links to prior learning	• Basic algebra eg. Expanding brackets, solving linear and quadratic equations. • Pythagoras Theorem. • Solve simultaneous equations. • Experience in collecting and working with data. • Basic probability from GCSE and confident working with fractions & decimals.	• Sketching quadratic, trig. & polynomial curves. Factorising polynomials. • Gradients and equations of straight lines. Understand negative & fractional indices. • Differentiation and understand negative & fractional indices. • Understanding of vectors from GCSE and Coordinate Geometry from last term.	• Laws of Indices and equations of straight lines. • Calculus from earlier this term. • Know the definitions of sinx, cosx and tanx and special angles. Know how to find a bearing. • Mock exams requires knowledge of all topics covered this year. Year 13 Content to be decided:

Year 12 A-Level Maths Overview 2023-24

		• Draw and interpret simple graphs eg. Speed-time graphs from GCSE Maths & Science. Be able to solve linear, quadratic & simultaneous equations. • Newton's laws from GCSE Science. • Calculus from earlier this term. • Know the definitions of sinx, cosx and tanx and special angles. Know how to find a bearing.	• Solving trig. Equations and use of the two trig. Identities from the year 1 course. • Vectors in 2 dimensions from Year 1. • Year 1 transformations of graphs and algebraic manipulation to solve equations and inequalities. • Constant acceleration formulae and Year 1 variable acceleration. Year 1 calculus. • Confident with year 1 probability and use of venn & tree diagrams. Understand the meaning of mutually exclusive & independent events.
Cultural Capital Opportunities	• Ritangle Competition in early December (problem solving): https://integralmaths.org/ritangle/	• Film: Hidden Figures	• Visit Bletchley Park • Film: The Imitation Game
Assessment Focus	• Private Study: Topic quiz/tests • Chapter Assessments	• Private Study: Topic quiz/tests • Chapter Assessments	• Private Study: Topic quiz/tests • Chapter Assessments • Mock Exams
Name of Knowledge Organiser/Link to Organiser	Year 1 A-Level Maths Overview 2023-2024		

Year 12 A-Level Maths Overview 2023-24

Morning Lessons

	Autumn Term Year 12				
Unit	**Chapter**	**Topic**	**Weeks**	**Integral Link**	**Schemes of Learning Link**
Statistics		Large Data Set 7	1	LDS Resources	LDS 7
Statistics	14	Data Collection	1	Collecting and interpreting data	Data Collection
Statistics	15	Data Processing, Presentation & Interpretation	5	Collecting and interpreting data	Data Processing, Presentation & Interpretation
Pure	9	The Binomial Expansion	2	The binomial expansion	Binomial Expansion
Statistics	16	Probability	2	Probability	Probability
Statistics	17	The Binomial Distribution	2	The binomial distribution	Binomial Distribution
Statistics	18	Hypothesis Testing Using The Binomial Distribution	1	Statistical hypothesis testing	Hypothesis Testing Using the Binomial Distribution
	Spring Term Year 12				
Statistics	18	Hypothesis Testing Using The Binomial Distribution	1	Statistical hypothesis testing	Hypothesis Testing Using the Binomial Distribution
Pure	8	Graphs & Transformations	2	Graphs and transformations	Graphs and Transformations
Pure	12	Vectors	1	Vectors	Vectors
Mechanics	19	Kinematics	3	Kinematics	Kinematics
Mechanics	20	Forces & Newton's Laws	4	Forces and Newton's laws	Forces and Newton's Laws of Motion
	Summer Term Year 12				
Pure	6	Trigonometry	2	Trigonometry	Trigonometry
Mechanics	21	Variable Acceleration	2	Variable acceleration	Variable Acceleration
	Mock Exams & Revision				
	Mechanics		Introduction, overview and papers		

Year 12 A-Level Maths Overview 2023-24

	Statistics		Introduction, overview and papers		
			Large data set resources		
	Start Year 13 Course				
	Content to be decided when number of lessons confirmed				

Afternoon Lessons

	Autumn Term Year 12				
Unit	**Chapter**	**Topic**	**Weeks**	**Integral Link**	**Scheme Of Learning Link**
Pure	1	The Problem Solving Cycle	2	Problem solving	Problem Solving
Pure	2	Surds & Indices	2	Surds and indices	Surds & Indices
Pure	3	Quadratic Functions	3	Quadratic functions	Quadratic Functions
Pure	4	Equations & Inequalities	2	Equations and inequalities	Equations and Inequalities
Pure	5	Coordinate Geometry	4	Coordinate geometry	Coordinate Geometry
Pure	7	Polynomials	1	Polynomials	Polynomials
	Spring Term Year 12				
Pure	7	Polynomials	1	Polynomials	Polynomials
Pure	10	Differentiation	8	Differentiation	Differentiation
Pure	11	Integration	3	Integration	Integration
	Summer Term Year 12				

Year 12 A-Level Maths Overview 2023-24

Pure	13	Exponentials & Logarithms	3	Exponentials and logarithms	Exponentials and Logarithms
	Mock Exams & Revision				
	Pure		Revision		
	Start Year 13 Course				
	Content to be decided when number of lessons confirmed				

Note: Integral is a subscription website so only students will be able to access these links.