



Years 12 & 13 Curriculum

A Level: Further Mathematics



	Further Maths					
Topic	Complex numbers		Matrices	Further algebra		Further calculus
Key Concepts	<ul style="list-style-type: none">Argand diagrams, including lociRoots of unityDe Moivre's theoremComplex plane transformations		<ul style="list-style-type: none">Matrix manipulationInverse matricesTransformationsMatrix equations	<ul style="list-style-type: none">Roots of polynomialsMethod of differencesSeries sumsMaclaurin series		<ul style="list-style-type: none">Volumes of revolutionImproper integralsMean value of a functionDifferentiate and integrate inverse trig functions
Topic	Further vectors		Polar co-ordinates	Hyperbolic functions		Differential equations
Key Concepts	<ul style="list-style-type: none">Equations of lines and planesScalar productIntersection of lines and planes		<ul style="list-style-type: none">Conversion between polar and Cartesian formsAreas of curvesSketching polar curves	<ul style="list-style-type: none">Exponential formDifferentiation and integrationSolving hyperbolic equations		<ul style="list-style-type: none">First order equations using integrating factorSeparation of variablesSecond order equationsRelated differential equations
	Further Statistics					
Topic	Discrete probability	Poisson and normal distributions	Negative binomial distribution	Hypothesis testing	Central limit theorem	Chi squared tests
Key Concepts	<ul style="list-style-type: none">Use of discrete probabilityPdf and pgfModelling	<ul style="list-style-type: none">Use and limitations of distributionsModelling and interpretation	<ul style="list-style-type: none">Use and interpretationModelling using distribution	<ul style="list-style-type: none">One and two tailed testsP valuesConfidence limits	<ul style="list-style-type: none">Distribution of sample meanLink to population mean	<ul style="list-style-type: none">Test between observed and expected frequenciesTesting of hypotheses
	Further Mechanics					
Topic	Momentum & Impulse		Work, Energy & Power	Elastic Strings		Elastic Collisions
Key Concepts	<ul style="list-style-type: none">Conservation of momentumImpulse-change in momentum lawsAngles of separation		<ul style="list-style-type: none">Work-energy principlePower equationsPower = rate of work	<ul style="list-style-type: none">Hooke's lawModulus of elasticitySimple harmonic motion		<ul style="list-style-type: none">2 and 3 dimensionsLoss of energyMomentum
	Decision Maths					
Topic	Algorithms & Graph Theory		Algorithms on Graphs	Critical Path Analysis		Linear Programming
Key Concepts	<ul style="list-style-type: none">Nature of algorithmsDefinitions of networks and graphsSorting algorithms		<ul style="list-style-type: none">Dijkstra's and Prim's methodsBin packingChinese postman and travelling salesman problems	<ul style="list-style-type: none">Event dependencyForward and backward passFloat and criticalityScheduling and resourcing		<ul style="list-style-type: none">Formulation of inequalitiesObjective functionsCritical regionsResource allocationSimplex Algorithm




Years 12 & 13 Assessment

A Level: Further Mathematics



All students will sit an assessment and a mock examination in Year 12 and two mock examinations in Year 13.

	Year 12		Year 13		Revision Resources
	Assessment	Mock Exam	Mock Exam	Mock Exam	
	Autumn Term	Summer Term	Autumn Term	Spring Term	
Style of Assessment	Paper 1: Pure Maths Paper 2: Applied Maths Paper 3: Applied Maths	Paper 1: Pure Maths Paper 2: Pure Maths	Paper 1: Pure Core paper Paper 2: Applied paper Paper 3: Further maths core paper	Single A Level: Paper 1: Pure paper 1 Paper 2: Pure paper 2, Paper 3: Applied paper Further A Level: Paper 1: Core paper 1 Paper 2: Core paper 2 Paper 3: Applied paper 1 Paper 4: Applied paper 2	Kennet Resources <ul style="list-style-type: none"> Core Questions Knowledge Organisers Learning Habits External Resources <ul style="list-style-type: none"> www.mymaths.co.uk www.amsp.org.uk www.integralmaths.org You can also find additional revision material on Frog 
Topics Assessed	Paper 1: Pure content – all single A Level topics Paper 2: Statistics & Mechanics – all single A Level topics	Paper 1: Complete Pure paper Paper 2: Pure A Level material taught up to this point Paper 3: Complete Applied paper on statistics & mechanics, plus all topics taught to this point	Paper 1: All single maths pure content Paper 2: All single maths applied topics Paper 3: Further Maths core topics (<i>from Year 12</i>): <ul style="list-style-type: none"> Complex numbers Series Roots of polynomials Volumes of revolution Matrix manipulation Proof by induction Matrices – inverses, linear transformations, solving equations Vectors 	<ul style="list-style-type: none"> Single Pure & Applied – all topics in A Level Further Core – all Pure Core topics Further Applied – all topics for each of the Applied options 	