Curriculum Map: A Level Mathematics

YEAR 12

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content	<u>Quadratics</u>	Exponentials and	Differentiation	<u>Kinematics</u>	Forces, Newton's Laws,	Revision and PPEs
Declarative	What a quadratic function	<u>Logarithms</u>			Statics and Dynamics	
knowledge	is		The derivative of $f(x)$ is the	The fundamental quantities		Then
'I Know'		What the function a^x is for	gradient of the tangent to	length, mass and time and	What a force is	
	What a quadratic graph	<i>a</i> > 0	the graph of $y = f(x)$	their S.I. units		Trigonometry and Circular
	looks like				The distinction between	<u>Measure</u>
		What the graph of	What a gradient graph is	The derived quantities	mass and weight	
	What the quadratic formula	$y = a^x$ looks like		velocity, acceleration and		Radian measure and
	and the discriminant is		What the second derivative	force including weight (and	Understand normal	conversions to and from
		What the function e^x is	IS	their S.I. units)	reaction forces, the tension	degrees
	Indices and surds		A		in a string or a rod, the	
		What the graph of	At a stationary point	The terms position,	thrust in a rod and friction	The formulae for arc length
	The laws of indices	$y = e^{x}$ looks like	$\frac{dy}{dx} = 0.$	displacement, distance		and the areas of a sector
				travelled and speed	Understand that objects	and a segment
	The laws of surds	The gradient of $y = e^{ixx}$ is	At a local maximum,		can be modelled as	
		proportional to the value of	$\frac{dy}{dt} = 0$ and $\frac{d^2y}{dt} < 0$.	Recall and understand the	particles.	The standard small angle
	Inequalities	the function	dx dx^2	(SUVAI) formulae for	Neuter's three louis of	approximations for $\sin \theta$,
	What an inequality is		At a local minimum	motion in a straight line	Newton's three Laws of	
	what an inequality is	the equivalence of the statements $y = a^x$ and	$dy = 0$ and $d^2y = 0$	motion in a straight line	Motion	Evact trigonomotric values
	Simultaneous equations	$\log x = x$	$\frac{1}{dx} = 0$ and $\frac{1}{dx^2} > 0$.	What a (accoloration due to	What oquilibrium is and	Exact trigonometric values
	<u>Simulaneous equations</u>	$\log_a y = x$.		gravity) is	what limiting equilibrium is	The definitions of secont
	What simultaneous	Likewise $y = a^x$ and	Coordinate Geometry	gravity) is	what minting equilibrium is	cosecant and cotangent:
	equations are	$\ln v = r$		The relationship between	What static friction and	their granhs ranges and
		$\lim y = x.$	The equation of a straight	the vector quantities	dynamic friction mean	domains
	Trigonometry	Know that the function	line	displacement and velocity	ayname medon mean	
	<u> </u>	$\log_a x$ is the inverse of a^x	The gradient conditions for	and their associated scalar	What a coefficient of	
	The definitions and graphs	for $a > 0$ and $x > 0$.	two straight lines to be	quantities distance and	friction is	Functions and
	of sine, cosine and tangent	- -	two straight lines to be	speed		Transformations
	, 5	Know that the function $\ln x$	parallel of perpendicular		The F $\leq \mu R$ model for	
	The sine and cosine rules	is the inverse of e^x .	The equation of a circle	Average speed and average	friction	What the modulus function
				velocity		is
	The trigonometric identities	$\log_a x$ is the inverse of a^x	Vectors	,	Statistical Hypothesis	
	$\tan \theta = \frac{\sin \theta}{\sin \theta}$ and	for $a > 0$ and $x \ge 0$.	vectors	Kinematics graphs may	Testing	What a graph of the
	$\cos\theta$ $\sin^2\theta \pm \cos^2\theta = 1$		What a vector quantity is	have negative		modulus function looks like
	$3in \ 0 + cos \ 0 = 1$	The laws of logarithms		displacements or velocities	The language of statistical	
	Polynomials and graphs		What component form is.		hypothesis testing: null	The definition of a function
		Know that $\log_a a = 1$ and	both in column vectors and	Make assumptions made	hypothesis, alternative	and the domain and range
	What a polynomial is	$\log_a 1 = 0.$	with <i>i</i> and <i>j</i> notation	when modelling projectiles	hypothesis, significance	
			-		level, test statistic, 1-tail	

	What polynomial and	Proof	What magnitude/direction	Data Presentation and	test. 2-tail test. critical	What a composite function
	reciprocal graphs look like	<u></u>	form means	Interpretation	value, critical region.	is
		The concept of	lotti meano	merpretation	acceptance region <i>n</i> -value	
	The effect of various	mathematical proof	What a position vector is	That data can be presented		When functions have
	graphical transformations			in a number of different	That the significance level is	inverses
	gruphical transformations	The terms:	What the resultant is	ways such as histograms	the probability of	111001303
	The factor theorem	Proof by exhaustion	what the resultant is	(single variable data) and	incorrectly rejecting the	The relationship between
		Proof by deduction	What parallel means	scatter diagrams (bivariate	null hypothesis	functions and their inverses
		Disproof by	what parallel means	data)	nun nypotnesis	and their graphs
		counterevemple	What collinear means	uata)		
		counterexample	what connear means	The definition of a		
		Dinomial Expansion	Statistical compling	ne definition of a		
		Binomial Expansion	<u>Statistical sampling</u>	probability distribution		
		M/hat a hinamial is	Million a fragmulation for and a	The fellowing recovered of		
		what a binomial is	what a population and a	The following measures of		
		De see Katarian ala	sample are	central tendency:		
		Pascal's triangle	T I (II) II	mean, mode and median		
		The formula of the Constant	The following sampling			
		The formulae for nCr and n!	techniques:	The following measures of		
			simple random sampling,	spread:		
			opportunity sampling,	range, interquartile range,		
			stratified sampling,	variation and standard		
			systematic sampling, quota	deviation		
			sampling and cluster			
			sampling.	The product moment		
				correlation coefficient		
			That different samples can			
			lead to different	Probability and Probability		
			conclusions about the	<u>distributions</u>		
			population			
				The definitions of mutually		
				exclusive events and		
				independent events		
				The conditions for the		
				Binomial distribution		
		ļ]				
Skills	<u>Quadratics</u>	Exponentials and	Differentiation	<u>Kinematics</u>	Forces, Newton's Laws,	Revision and PPEs
Procedural	Sketch quadratic graphs	<u>Logarithms</u>			Statics and Dynamics	
Knowledge			Use the derivative of $f(x)$	Convert between		Then
ʻl know	Solve quadratic equations	Sketch exponential graphs	to find the equation of a	commonly used S.I. units	Model forces as vectors	
how to'		$y = a^x$ for $a > 0$ and $y =$	tangent			Trigonometry and Circular
	Factorise quadratics	e ^x and simple		Convert from non-standard	Draw force diagrams for	<u>Measure</u>
		transformations of these	Differentiate polynomials	units	bodies that are at rest or	
	Use the quadratic formula	functions	from first principles		moving with constant	Use exact trigonometric
	1					values.

Complete the square	Use $\log_a x$ as the inverse of	Find the second derivative	Use and interpret	velocity or constant	
Determine the number of	a^x is for $a > 0$ and $x \ge 0$		kinematics graphs,	acceleration	Calculate arc lengths and
solutions a quadratic has		Sketch gradient graphs	including the gradient of a		areas of sectors and
	Use $\ln x$ as the inverse of		displacement-time graph	Find the resultant of several	segments
Indices and surds	e^x	Interpret gradients as rates	and the gradient of, or area	forces acting at a point	
		of change	under, a velocity-time	including by use of a vector	Use small angle
Use the laws of indices	Simplify expressions		graph	diagram or resolving into	approximations
	involving logarithms	Differentiate x^n (for		perpendicular components	
Manipulate, use and		rational values of n) and	Use and derive the SUVAT		Sketch graphs of reciprocal
simplify surds	Solve equations of the form	related constant multiples,	formulae.	Use Newton's three Laws of	trigonometric functions
	$a^x = b$, including $e^x = b$.	sums and differences		Motion to find unknown	
<u>Inequalities</u>			Use calculus in kinematics	values	Functions and
	Reduce a non-linear	Apply differentiation to find	for motion in a straight line:		Transformations
Solve linear and quadratic	relation to linear form.	gradients, tangents and		Work with weight and	
inequalities.		normal	$dr = dv = d^2r$	motion in a straight line	Find the modulus of a
	Estimate parameters in the		$v = \frac{1}{dt}$ $a = \frac{1}{dt} = \frac{1}{dt^2}$	under gravity	function and sketch its
Represent linear and	relationships of the form	Apply differentiation to find			graph.
quadratic inequalities	$y = ax^n$ and $y = kb^x$ by	stationary points.	$r = \int v dt$ $v = \int a dt$	Identify action and reaction	
graphically.	plotting graphs, drawing		$V = \int u du$	forces	Solve equations involve the
	lines of best fit and	Identify where functions			modulus function
Express solutions of	calculating and interpreting	are increasing or	Sketch either a	Statistical Hypothesis	
inequalities using set	gradients and intercepts.	decreasing.	displacement-time or	Testing	Find the maximum domain
notation.			velocity-time graph for a		and range of a function
	Perform simple	Coordinate Geometry	given scenario.	Conduct a statistical	
Simultaneous equations	transformations of			hypothesis test for the	Find composite functions.
Solve simultaneous	$y = e^{x}$ and $y = \ln x$.	Use the equation of a	Derive the SUVAT formulae,	proportion in the binomial	Find in some for stime and
equations by substitution.	Identify and describe single	formed	for instance from a velocity-	distribution and interpret	Find inverse functions and
Salva simultanaaus	transformations of the	1011115	time graph.	the results in context	sketch their graphs
solve simulations	functions a^x and a^x	$y - y_1 = m(x - x_1)$ and ax + by + c = 0		Calculate p values and	Describe combinations of
equations by emmation.		ux + by + c = 0.	Data Presentation and	critical regions	graph transformations and
Represent and solve	Use given conditions to	Use the coordinate	Interpretation	childar regions	sketch associated graphs
simultaneous equations	determine the values of	geometry of the circle			sketch associated graphs
granhically	unknown constants in	including using the	Interpret diagrams for		
Sidpineury.	$y = Ae^{bx} + C$	equation of a circle in the	single-variable data,		
Trigonometry	or in $P = Ak^t + C$.	form	Including understanding		
<u>Ingenerica y</u>		$(x-a)^2 + (y-b)^2 = r^2$	that area in a histogram		
Sketch graphs of sine.	Translate a situation in		represents frequency.		
cosine and tangent and	context into a	Complete the square to	Connect to probability		
related functions	mathematical model.	find the centre and radius	distributions		
		of a circle.			
Use the sine and cosine			Interpret scatter diagrams		
rules to find missing angles		<u>Vectors</u>	and regression lines for		
and sides			hivariate data including		

Solve trigonometric ulterval Erzof For 2 vectors, convert between component form and magnitude/direction form recognition of scatter diagrams recognition of scatter diagrams Find the area of a triangle Use and interpret togical symbols. Interpret correlation and understand that correlation des not imply causation. Interpret correlation and understand that correlation des not imply causation. Interpret correlation and understand that correlation des not imply causation. Vectors Manipulate polynomials aperiations and skitch factorise and divide polynomials Use the structure of mathematical proof proof logical teps to a series of logical teps to a calculate the distance topion form Calculate and interpret measures of certral addition of vectors and understand divide polynomials Calculate the distance proof by deduction to proof by exhaustion Calculate the distance topion form summary statistics Recognise and interpret measures of addition possible uniterpret possible uniterpret possibl							
equations in given interval Use and interpret logical symbols and implication symbols and implication symbols. enderwan component from and magnitude/direction and magnitude/direction diagrammatically interpret conclusion and magnitude/direction adve routs interpret conclusion adve routs interpret conclusion adve routs interpret conclusion does not imply causation interpret conclusion Palvnomials and graphs algebraically Use the structure of mathematical proof, proof indigical tops to a service of logical steps to a service of logica se		Solve trigonometric	Proof	For 2 D vectors, convert	recognition of scatter		
IntervalUse and interpret logical symbols.and magnitude/direction formInterpret correlation and understand that correlation does not imply coussition does not imply coussition algebraically possible cortrait transformations and setter assumptions through a setter factor theorem to torceeding from given assumptions through a setter assumptions through a torned data and theorem available and interpret torsection and functions; to proot by torsection and functions; to proot by torsection and functions; to proot by torsection and functions; to proot by torsection and formal toremation and interpret torsection and functions; to proot by torsection and functions; torsection and function; torsection and functi		equations in a given		between component form	diagrams		
Find the area of a trianglesymbols and implicationformInterpret orrelation and understand that correlation and unde		interval	Use and interpret logical	and magnitude/direction			
Find the area of a trianglesymbols.understors add vectors diagrammatically erform algebraicallyunderstors does not imply causation does not imply causation calculate and interpret maximum statistics from algebraicallyunderstore and does not imply causation calculate and interpret maximum statistics from algebraicallyunderstore and does not imply causation calculate and interpret maximum statisticsunderstore and does not imply causation calculate and interpret maximum statisticsunderstore and does not imply causation calculate and interpret maximum statisticsunderstore and multiplication by a scala tenders and variation, possible outlies in data sets and statistical diagram presentation techniques in the origine as and problemunderstore and interpret messing and interpret messing and interpret maximum statistical possible outlies in data sets and statistical diagram sets and statistical diagram sets and statistical diagram presentation techniques in the contrading and problemunderstore and interpret messing and interpret messing and interpret messing and interpret possible outlies in data sets and statistical diagram sets and statistical diagram sets and statistical diagram problemunderstore and interpret messing and interpret messing and interpret messing and interpret sets and statistical and problemunderstore and interpret messing and interpret messing and interpret messing and interpret sets and statistical and presentation techniques in the origine as and the origine as and statistical sampling toread binomials of the form and interpret sampling techniquesunderstore and interpret messing and interpret messing and interpret <br< td=""><td></td><td></td><td>symbols and implication</td><td>form</td><td>Interpret correlation and</td><td></td><td></td></br<>			symbols and implication	form	Interpret correlation and		
Add vectors Polynomials algebraically mainpulate polynomials algebraically agebraically use the factor theorem to factorise and divide polynomials series of logical steps to a convertision.Add vectors diagrammatically the addition of vectors and multiplication by a scalar defined by polynomials series of logical steps to a convertision.does not imply causation Calculate and interpret measures of central tendency and variation, between two pointsdoes not imply causation Calculate and interpret measures of central tendency and variation, tendency and vari		Find the area of a triangle	symbols.		understand that correlation		
Polynomials and graphs Manipulate polynomials algebraically algebraically algebraically algebraically algebraically algebraicallyUse the structure of mathematical proof, perform algebraically the addition of vectors and multiplication by a scalar conclusion.Calculate and interpret measures of central tenders and variation, both from raw data and from summary statisticsUse the factor theorem to polynomialsUse different methods of proof including: • Proof by exhaustionPerform algebraically the addition of vectors and multiplication by a scalar defined by position vectorsCalculate the distance between two points defined by position vectorsRecognise and interpret measures of central tenders and statistical diagramsSketch curves defined by polynomialsUse different methods of proof by deduction • Disproof by counterexampleDemonstrate collinearity Statistical Sampling Use samples to make inte conset of a statistical statistical from the pay and probability distributionsSelect or critique data problemSketch graphs tend reg and proof tend reg and find tend reg and proof tend reg and proof tend reg and proof tend reg and proof tend reg and find tend reg and proof tend reg and proof tend reg and reg and find tend reg and find tend reg and reg a		5		Add vectors	does not imply causation		
AnalysisAnalysismathematical proof, proceeding from given agebraically accised from given series of logical steps to a colculator in factorise and divide polynomialsmathematical proof, proceeding from given accised from given to gradient of vectors and multiplication by a scalarCalculate and interpret magues of central tendency and variation, multiplication by a scalarCalculate and interpret mentors and anultiplication by a scalarSketch curves defined by polynomialsUse different methods of proof including: exhaustionCalculate the distance defined by position vectorsRecognise and interpret possible outliers in data sessible outliers in data select or critique sampling techniques in the context of a statistical probabilities aduiting more adata select or critique sampling techniques in the context of <br< td=""><td></td><td>Polynomials and graphs</td><td>Use the structure of</td><td>diagrammatically</td><td></td><td></td><td></td></br<>		Polynomials and graphs	Use the structure of	diagrammatically			
Manipulate polynomials algebraicallyproceeding from given assumptions through a assumption through a sumption through a conclusion.Perform algebraically the addition of vectors and measures of central tendency and variation, both from summary statisticsmeasures of central tendency and variation, both from summary statisticsUse the factor theorem to polynomialsConclusion.Calculate the distance between two points denied by position vectorsRecognise and interpret possible outlies in data prosentation through a sets and statistical diagramsRecognise and interpret possible outlies in data sets and statistical diagramsDescribe graph transformations and sketch associated graphsBinomial Expansion (a + b) ⁿ and (1 + x) ⁿ Use samples to make indenting internees about the populationProbability and Probability distributionsProbability and Probability distributionsProbability and Probability distributionsSelect or critique data prosentation techniques in the context of a statistical diagramsStrategies Conditional Nume toQuadratics secan's triange, the formula for nCr and the chose function on the calculator to find Binomial cefficientsDifferentiationSelect or critique data probability distributionsForces. Newton's Laws. Statiscal probability distributionAs Revision and AS PPEs ThenStrategies Conditional Newtow when to'Quadratic formula or propential formula techniques in the context of statiscial probability diving differentiation by first principlesSile calculate robability distributionAs Revision and AS PPEs ThenStrategies <br< td=""><td></td><td><u></u></td><td>mathematical proof</td><td></td><td>Calculate and interpret</td><td></td><td></td></br<>		<u></u>	mathematical proof		Calculate and interpret		
algebraically algebraically use the factor theorem to factorise and divide polynomialsassumptions through a series of logical steps to a conclusion.addition of vectors and multiplication by a scalar calculate the distance between two points defined by position vectorstendency and variation, both from raw data and from summary statisticsbetween two points possible outliers in data sets and statistical diagrams sets and statistical diagrams sets and statistical diagrams sets and statistical diagrams sets and statistical probability distributionstendency and variation, both from raw data and from summary statisticssets sets and statistical prosible outliers in data sets and statistical prosible outliers in data sets and statistical probability distributionstendency and variation, both from raw data and from summary statisticssets sets and statistical prosible outliers in data sets and statistical probability distributionssets sets and statistical diagramssets sets and statistical sets and statistical diagramssets setsset<		Manipulate polynomials	proceeding from given	Perform algebraically the	measures of central		
Sector divide polynomialsSeries of logical steps to a conclusion.multiplication by a scalar form summary statisticsboth from raw data and from summary statisticsSketch curves defined by polynomialsUse different methods of profinculding: • Proof by exhaustionRecognise and interpret possible outliers in data sets and statistical diagrams sets and statistical diagramsSelect or critique data prosentation techniques in the constrate collinearitySelect or critique data prosentation techniques in the constrate collinearitySketch graphs of the form y = $\frac{2}{2}$ and y = $\frac{4}{2}$ and find their asymptotesUse the Binomial formula to expand binomials of the form ($a + b$) ⁿ and ($1 + x$) ⁿ Use samples to make informal inferences about to sampling techniques solving a statistical probabilities use avariety of different isolving a statistical probabilities use avariety of different isolving a statistical probabilities use avariety of different isolving a statistical probabilities use avariety of firer trinciplesSector critique sampling techniques appropriate to solve aquadratic equation first principlesSector critique sampling techniques firer to solve aquadratic equation first p		algebraically	assumptions through a	addition of vectors and	tendency and variation		
Use the factor theorem to factorise and divide polynomialsConclusion.Interpret of a conclusion.Interpret of a conclusion.Interpret of a conclusion.Interpret op solution wetcome polynomialsInterpret op solution wetcome polynomials <thinterpret op="" solution<br=""></thinterpret> polynomialsInt		algeoratearly	series of logical steps to a	multiplication by a scalar	both from raw data and		
Strategies Conditional Roovedatic Solve a quadratic form or Prior orCalculate the distance between two points defined by position vectors polynomialsCalculate the distance between two points defined by position vectors polynomialsRecognise and interpret polynomialsDescribe graph transformations and sketch associated graphsDisproof by exhaustion - Proof by deduction - Disproof by counterexampleDemostrate collinearity transformations and sketch associated graphsSelect or critique data presentation techniques in the counter to a statistical problemSketch graphs of the form y = $\frac{g}{x}$ and find their asymptotesBinomial Expansion Use the Binomial formula to expand binomials of the form (a + b)" and (1 + x)"Use samples to make informal inferences about the population the populationsProbability distributionsUse samples to make informal inferences about the populationsStrategies Conditional KnowledgeQuadratic form and use exponential modelDifferent form and use exponential modelDifferent form and use exponential modelSelect or critique sampling techniques in the context of solving a statistical probabilities using a statistical probabilities using a statistical probabilities using a statistical probabilities solving a uddratic form or or predictionsDifferentiation by first principlesKinematics Use SUVAT formulae (for constant acceleration)Eorces. Newton's Laws, Apply Newton's Laws of Motion as appropriate to solving a uddratic form or or predictions to make equivatiation on or first p		Use the factor theorem to	conclusion	manapheation by a sealar	from summary statistics		
SteelerDescribe and integret polynomialsUse different methods of prod including: • Proof by exhaustion • Disprof by counterexampleDescribe and statistical diagrams section and sketch associated graphsRecognise and interpret possible outliers in data select or critique data presentation techniques in the context of a statistical distributionsRecognise and interpret possible outliers in data select or critique data presentation techniques in the context of a statistical distributionsRecognise and interpret possible outliers in data select or critique data presentation techniques in the context of a statistical distributionsRecognise and interpret possible outliers in data select or critique data presentation techniques in the context of a statistical distributionsRecognise and interpret possible outliers in data select or critique data presentation techniques in the context of a statistical use mutually exclusive and independent events when calculator to find Binomial coefficientsRecognise and interpret possible outliers in data select or critique data presentation techniquesRecognise and interpret possible outliers in data select or critique data presentation techniques in the populationRecognise and interpret possible outliers in data select or critique data use mutually exclusive and independent events when calculator to find Binomial coefficientsRecognise and interpret possible outliers in data select or critique data tichniques in the context of select or critique data tichniques in the context of solving a statistical problemRecognise and interpret possible outliers in data select or critique data tichniques in the context of solving a stati		factorise and divide		Calculate the distance	nom summary statistics		
$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c}$		nolynomials	Use different methods of	between two points	Recognise and interpret		
Sketch curves defined by polynomialsphotometalong. exhaustion $Proof by$ exhaustion $Proof by deductionProof by deductionProof by deductionProof by deductioncurves defined bysets and statistical diagramsSelect or critique datapresentation techniques inthe context of a statisticalproblemsets and statisticalpresentation techniques inthe context of a statisticalproblemset and statisticalpresentation techniques inthe context of a statisti$		polynomials	proof including:	defined by position vectors	nossible outliers in data		
Sector Control of the Control of the Control of transformationsExpensionControl of the context of a statistical of the context of a statistical problemSelect or critique data presentation techniques in the context of a statistical problemSector graph transformations and sketch associated graphsBinomial ExpansionUse samples to make informal information techniques in the context of a statistical problemProbability and Probability and Probability distributionsSketch graphs of the form y = $\frac{d}{x}$ and y = $\frac{d}{q^2}$ and find their asymptotesBinomial ExpansionUse samples to make informal inferences about the populationProbability and Probability distributionsUse the Binomial formula to expand binomials of the form (a + b) ⁿ and (1 + x) ⁿ Use a variety of different sampling techniquesProbabilities using techniques in the context of a statistical problemStrategiesQuadraticsExponentials and LogarithmsDifferentiationSelect or critique sampling techniquesCalculate probabilities using techniques in the isonical distributionKnowledgeQuadratic formula or complete the square to solve a quadratic equationExponentials and LogarithmsDifferentiationNetwer to'Apply an exponential modelApply the limiting process during differentiationStatics and DynamicsApply Newton's Laws, for on solve a graph of the context of indices to a satistical problemVent to'Put a quadratic in predictions to make predictionsUse the laws of indices to assistical problemUse SUVAT formulae (for constant acceleration)Apply Newton's Laws, for on the solve problems, for instance involving contexted particlesApply Newton's Laws, for instance involving consolve to assistic		Sketch curves defined by	Broof by	defined by position vectors	sets and statistical diagrams		
Strategies Conditional When to'Quadratics Factorise, apply the quadratic in prus quadratic in prus quadratic in put a quadratic i		nolynomials	• Proof by	Identify parallel vectors	sets and statistical diagrams		
Describe graph transformations and sketch associated graphs- Proof by deduction . Disproof by counterexampleDemonstrate collinearity statistical Sampling Use samples to make intermal inferences about their asymptotesDemonstrate collinearity statistical Sampling Use the Binomial formula to expand binomials of the form (a + b) ⁿ and (1 + x) ⁿ Demonstrate collinearity statistical Sampling Use a variety of different sampling techniquesDemonstrate collinearity problemDemonstrate collinearity problem		polynomiais	exitaustion	identity parallel vectors	Soloct or critique data		
 Descritation problem Disprositive Graphing Disprositive Contreative Contreative Contrentions and sketch associated graphs Sketch graphs of the form y = ^a/_x and y = ^a/_{x²} and find their asymptotes Binomial Expansion Use the Binomial formula to expand binomials of the form (a + b)ⁿ and (1 + x)ⁿ Use Pascal's triangle, the formula for nCr and the choices about acceleration on the calculating probabilities Select or critique sampling techniques Calculate probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities contreation on the calculation or triangle techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of a statistical probabilities using techniques in the context of solving a statistical problem Strategies Conditional Knowledge 'I know when to' Solve a quadratic formula or complete the square to solve a quadratic equation Put a quadratic in factorised form or and use exponential equation Put a quadratic in a problem is to make error predictions Put a quadratic in factorised form or predictions Solve a quadratic equation predictions Solve a quadratic in problem is to make predictions Solve a quadratic in problem is to make predictions Solve a quadratic in problem is to make predictions Solve a quadratic in problem is to make predictions Solve a quadratic in problem is to make predictions Solve problems, for instance in		Describe graph	Proof by deduction	Domonstrato collingarity	procentation techniques in		
Statistical sectorCounterexampleStatistical SamplingDifferentiationassociated graphsBinomial ExpansionUse samples to make informal inferences about the opulation $Probability$ and $Probability$ distributions $Probability$ and $Probability$ distributionsSketch graphs of the form $y = \frac{a}{x}$ and $y = \frac{a}{x^2}$ and find their asymptotesUse the Binomial formula 		transformations and skotch	Disproof by	Demonstrate commeanty	the context of a statistical		
Statistical s		transformations and sketch	counterexample	Statistical Compling			
Sketch graphs of the form $y = \frac{a}{x^2}$ and $y = \frac{a}{x^2}$ and find their asymptotesBinomial Expansion Use samples to make informal inferences about the populationProbability and Probability distributionsProbability and Probability distributionsProbability distributionsProbability distributionsProbability distributionsProbability distributionsProbability distributionsProbability distributionsProbability distributionP		associated graphs		<u>Statistical Sampling</u>	problem		
Strategies Conditional Knowledge 'I know when to'Quadratics Factorise, apply the solve a quadratic equationExponentials and LogarithmsDifferentiation predictionsKinematics (or variable acceleration)Forces, Newton's Laws, of Notion as appropriate to solve a quadratic on frist principlesAs Revision and AS PPEs Trigonometry and CircularVertexQuadratic in factorised form or predictionsForm and use exponential equationsDifferentiation during differentiation assist differentiationKinematics (or variable acceleration)Forces, Newton's Laws, of Notion as appropriate to solve a quadratic on predictionsAs Revision and AS PPEs Trigonometry and Circular When to evaluate a result		Chatab area be of the form	Binomial Expansion		Due he hilith , and Due he hilith		
$y = \frac{1}{x} \text{ and } y = \frac{1}{x^2} \text{ and find} \text{ their asymptotes}$ $y = \frac{1}{x} \text{ and } y = \frac{1}{x^2} \text{ and find} \text{ the Binomial formula to expand binomials of the form} (a + b)^n \text{ and } (1 + x)^n$ $(a + b)^n \text{ and } (1 + x)^n$ $Use Pascal's triangle, the formula for nCr and the chose function on the calculator to find Binomial coefficients$ $Use Pascal's triangle, the formula for nCr and the chose function on the calculator to find Binomial coefficients$ $Select or critique sampling techniques$ $Select or critiq$		Sketch graphs of the form		Use samples to make	Probability and Probability		
their asymptotesto expand binomials of the form (a + b) ⁿ and (1 + x) ⁿ the population Use a variety of different sampling techniquesUse mutually exclusive and independent events when calculating probabilitiesUse mutually exclusive and interving interving exclusive and interving interving exclusionUse mutually exclusive and use SUVAT formulae (for Constant acceleration)Use saluesMandemating probabilitiesAs Revision and AS PPE		$y = \frac{x}{x}$ and $y = \frac{x}{x^2}$ and find	Use the Binomial formula	informal inferences about	distributions		
form (a + b) ⁿ and (1 + x) ⁿ Use a variety of different sampling techniquesUse mutually exclusive and independent events when calculating probabilitiesUse mutually exclusive and independent events when calculating probabilitiesUse Pascal's triangle, the formula for nCr and the choose function on the calculator to find Binomial coefficientsSelect or critique sampling techniques in the context of solving a statistical problemCalculate probabilitiesSelect or critique sampling the binomial distributionStrategies Conditional Knowledge 'I know when to'Quadratics Factorise, apply the quadratic formula or to aquadratic equationExponentials and LogarithmsDifferentiation Apply the limiting process during differentiation by first principlesKinematics to solve a quadratic equationAS Revision and AS PPEs ThenPut a quadratic in factorised form or predictionsExponential model equations to make predictionsDifferentiation trig principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws, Apply Newton's Laws of Motion as appropriate to solve problems, for instance involving connected particlesAS Revision and AS PPEs Then		their asymptotes	to expand binomials of the	the population			
Image: Conditional Knowledge when to'QuadraticsExponentials and LogarithmsDifferentiationKinematicsForces. Newton's Laws. Statics and DynamicsAS Revision and AS PPEsThenYaply the imiting process during differentiation by factorised form orApply an exponential equations to makeDifferentiationKinematics (for variable acceleration)Forces. Newton's Laws. Statics and DynamicsAS Revision and AS PPEsThenTrigonometry and Circular manual correctionsApply the limiting process during differentiation by first principlesUse calculus in kinematics (for variable acceleration)Forces. Newton's Laws. Apply Newton's Laws of Motion as appropriate to solve problems, for instance involvingAS Revision and AS PPEs Motion as appropriate to solve roblems, for instance involvingMage the initian of the solution of constant acceleration)Kinematics (for variable acceleration)Forces. Newton's Laws. Motion as appropriate to solve problems, for instance involvingAs Revision and AS PPEs Motion as appropriate to solve problems, for instance involvingMage the initian of the solution of constant acceleration)Mage the initian of the constant accelerationMage the initian of the solution of the solution of to constant accelerationMage the initian of the solution			form		Use mutually exclusive and		
Strategies Conditional KnowledgeQuadratics Factorise, apply the quadratic formula or complete the square to when to'Exponentials and LogarithmsDifferentiation during differentiation by first principlesKinematics constant acceleration)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenVene to ''Put a quadratic in factorised form or predictionsExponential model equations to make predictionsDifferentiation during differentiation first principlesKinematics (for variable acceleration)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenTrigonometry and Circular MeasureForm and use exponential equations to make predictionsUse the laws of indices to assist differentiation assist differentiationUse calculus in kinematics (for variable acceleration)Forces, Newton's Laws, Statics and DynamicsAs Revision and AS PPEs ThenWhen to evaluate a resultForm and use exponential equations to make predictionsUse the laws of indices to assist differentiationUse calculus in kinematics (for variable acceleration)Forces, Newton's Laws, Statics and DynamicsTrigonometry and Circular Measure			$(a + b)^n$ and $(1 + x)^n$	Use a variety of different	independent events when		
Strategies Conditional Knowledge when to'Quadratics Factorise, apply the quadratic formula or Form and use exponential equations to makeExponentials and LogarithmsDifferentiation first principlesKinematics (constant acceleration)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenVene of the square to when to'Differentiation (complete the square to solve a quadratic in factorised form orExponential model equations to makeDifferentiation (complete the square to solve a quadratic in factorised form orExponential model equations to makeDifferentiation (complete the square to solve a quadratic in factorised form or predictionsUse the laws of indices to assist differentiationExponential (complete the square to solve a quadratic in factorised form orDifferentiation (complete the square to solve a quadratic in factorised form orAsply an exponential equations to makeUse the laws of indices to assist differentiationUse calculus in kinematics (for variable acceleration)Forces, Newton's Laws, Apply Newton's Laws, solve a puadratic in instance involving connected particlesAs Revision and As PPEs Then				sampling techniques	calculating probabilities		
StrategiesQuadratics Factorise, apply the quadratic formula or complete the square to when to'Exponentials and LogarithmsDifferentiation Apply the limiting process during differentiation by first principlesKinematics (Suppression)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenVance form and use exponential protictionsDifferentiation (first principles)Kinematics (for variable acceleration)Forces, Newton's Laws, (for variable acceleration)AS Revision and AS PPEs (for variable acceleration)Vance factorised form orDifferentiation (for variable acceleration)Use SUVAT formulae (for (for variable acceleration)Apply Newton's Laws of (for variable acceleration)Apply Newton's Laws of (for variable acceleration)Trigonometry and Circular (for variable acceleration)When to evaluate a result			Use Pascal's triangle, the				
Strategies Conditional Knowledge 'I know when to'Quadratics Factorise, apply the solve a quadratic equation Put a quadratic in factorised form orExponentials and LogarithmsDifferentiation Apply the limiting process during differentiation by first principlesKinematics constant acceleration)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenUse SUVAT formulae (for vhen to'Forces, newton's Laws, solve a quadratic equationApply an exponential equations to make predictionsDifferentiation uring differentiation tist principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws, Apply Newton's Laws of Motion as appropriate to solve problems, for instance involving connected particlesAs Revision and AS PPEs Motion as appropriate to solve problems, for instance involving connected particlesWhen to evaluate a result			formula for nCr and the	Select or critique sampling	Calculate probabilities using		
Strategies Conditional Nowledge '1 know when to'Quadratics Factorise, apply the quadratic formula or '1 know bulket the square to bulket the square to when to'Exponentials and LogarithmsDifferentiation Apply the limiting process during differentiation by first principlesKinematics to solve a quadratic equation factorised form orForces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs Statics and DynamicsVent a quadratic in factorised form orExponential model equations to make predictionsDifferentiation to make predictionsUse SUVAT formulae (for constant acceleration)Apply Newton's Laws, Motion as appropriate to solve a quadratic in factorised form orAS Revision and AS PPEs to gravithmsVent a quadratic in factorised form orExponential predictionsDifferentiation use the laws of indices to assist differentiationUse calculus in kinematics (for variable acceleration)Solve a calculus in kinematics instance involving connected particlesMeasure When to evaluate a result			choose function on the	techniques in the context of	the binomial distribution		
Strategies Conditional Knowledge 1 knowQuadratics Factorise, apply the udaratic formula or 1 knowExponentials and LogarithmsDifferentiation Apply the limiting process during differentiation by first principlesKinematics onduring differentiation by first principlesForces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs Apply the limiting process during differentiation by first principlesKinematics onstant acceleration)Forces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs ThenVent a quadratic in factorised form orExponential predictions to makeDifferentiation Use the laws of indices to assist differentiationUse sUVAT formulae (for constant acceleration)Apply Newton's Laws of Motion as appropriate to solve problems, for instance involving connected particlesMeasurePut a quadratic in factorised form orequations to make predictionsUse the laws of indices to assist differentiationUse the laws of indices to assist differentiationWhen to evaluate a result			calculator to find Binomial	solving a statistical problem			
Image: strategies Conditional Factorise, apply the 'I know when to'Quadratics Factorise, apply the LogarithmsExponentials and LogarithmsDifferentiation Pifferentiation during differentiation by first principlesKinematics Constant accelerationForces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs AS Revision and AS PPEs Then'I know when to'quadratic formula or 'I know solve a quadratic equationApply an exponential modelApply the limiting process during differentiation by first principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws of Motion as appropriate to solve problems, for instance involvingTrigonometry and Circular MeasurePut a quadratic in factorised form orequations to make predictionsUse the laws of indices to assist differentiationUse calculus in kinematics (for variable acceleration)solve problems, for instance involvingMeasure MeasureKinematics (for variable acceleration)predictions assist differentiationassist differentiationKinematics connected particlesWhen to evaluate a result			coefficients				
StrategiesQuadraticsExponentials and LogarithmsDifferentiationKinematicsForces, Newton's Laws, Statics and DynamicsAS Revision and AS PPEs As Revision and AS PPEsConditionalFactorise, apply the quadratic formula orLogarithmsApply the limiting process during differentiation by first principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws, of Motion as appropriate to solve problems, forAS Revision and AS PPEs ThenWhen to'Solve a quadratic equationApply an exponential first principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws of Motion as appropriate to instance involvingTrigonometry and Circular MeasurePut a quadratic in factorised form orequations to makeUse the laws of indices to assist differentiation(for variable acceleration)solve problems, for instance involving connected particlesMen to evaluate a result							
Conditional KnowledgeFactorise, apply the quadratic formula orLogarithmsLogarithmsApply the limiting process during differentiation by first principlesUse SUVAT formulae (for constant acceleration)Statics and Dynamics ThenThen'I knowcomplete the square to solve a quadratic equationApply an exponential model first principlesduring differentiation by first principlesUse SUVAT formulae (for constant acceleration)Apply Newton's Laws of Motion as appropriate to solve problems, for instance involvingTrigonometry and Circular MeasurePut a quadratic in factorised form orpredictionsUse the laws of indices to assist differentiation(for variable acceleration)solve problems, for instance involving connected particlesMen to evaluate a result	Strategies	<u>Quadratics</u>	Exponentials and	Differentiation	<u>Kinematics</u>	Forces, Newton's Laws,	AS Revision and AS PPEs
Knowledge '1 knowquadratic formula or complete the square to when to'Apply an exponential modelApply the limiting process during differentiation by first principlesUse SUVAT formulae (for constant acceleration)Then'1 knowsolve a quadratic equationApply an exponential modelduring differentiation by first principlesSolve a quadratic equationApply Newton's Laws of Motion as appropriate to solve problems, forTrigonometry and Circular MeasurePut a quadratic in factorised form orequations to makeUse the laws of indices to assist differentiation(for variable acceleration)instance involving connected particlesMen to evaluate a result	Conditional	Factorise, apply the	<u>Logarithms</u>			Statics and Dynamics	
'I know when to'complete the square to solve a quadratic equationApply an exponential model first principlesduring differentiation by first principlesconstant acceleration)Apply Newton's Laws of Motion as appropriate to solve problems, forTrigonometry and Circular Measure'I know when to'Form and use exponential equations to makeUse the laws of indices to for variable acceleration)Use calculus in kinematics (for variable acceleration)Solve problems, for instance involving connected particlesMeasure	Knowledge	quadratic formula or		Apply the limiting process	Use SUVAT formulae (for		Then
when to'solve a quadratic equationForm and use exponentialfirst principlesMotion as appropriate toTrigonometry and CircularPut a quadratic inequations to makeUse the laws of indices to(for variable acceleration)solve problems, forMeasurefactorised form orpredictionsassist differentiationassist differentiationconnected particlesWhen to evaluate a result	'I know	complete the square to	Apply an exponential model	during differentiation by	constant acceleration)	Apply Newton's Laws of	
Put a quadratic in factorised form orForm and use exponential equations to makeUse the laws of indices to assist differentiationUse calculus in kinematics (for variable acceleration)solve problems, for instance involving connected particlesMeasureWhen to evaluate a result	when to'	solve a quadratic equation		first principles		Motion as appropriate to	Trigonometry and Circular
Put a quadratic in factorised form orequations to make predictionsUse the laws of indices to assist differentiation(for variable acceleration)instance involving connected particlesWhen to evaluate a result			Form and use exponential		Use calculus in kinematics	solve problems, for	Measure
factorised form or predictions assist differentiation connected particles When to evaluate a result		Put a quadratic in	equations to make	Use the laws of indices to	(for variable acceleration)	instance involving	
		factorised form or	predictions	assist differentiation	,	connected particles	When to evaluate a result
completed square form to and when to show it with		completed square form to			Give a final answer to a		and when to show it with
sketch a quadratic particular degree of relevant steps		sketch a quadratic			particular degree of		relevant steps

	Apply the laws of	Use the second derivative	accuracy, dependent on the	Apply SUVAT formulae in	
Apply the discriminant	logarithms to simplify	to determine the nature of	information given in the	contexts involving forces	Functions and
	expressions and solve	a stationary point	question		Transformations
Apply the techniques for	equations			Use gravitational	
quadratics to disguised		Coordinate Geometry	Data Presentation and	acceleration <i>g</i> to varying	Apply graph
quadratics and related	Use logarithmic graphs to		Interpretation	degrees of accuracy	transformations
functions	estimate parameters	Use straight line models in			
		a variety of contexts	Use scatter diagrams to	Assume during motion	Apply functions to different
Indices and surds	Use exponential growth		assess correlation	under gravity that <i>a</i>	contexts
	and decay in modelling	Use of the following		remains constant, that	
Apply the laws of indices		properties.	Use histograms to	objects can be treated as	
spply the laws of malees	Consider limitations and	properties	represent single variable	narticles and that	
Leave answers in surd form	refinements in exponential	• the angle in a	data	resistance forces are	
	models	• the angle in a	uata	nogligible	
Inoqualities	models		Chaosa appropriata	negigible	
inequalities		aligie	moscures of control		
	Manipulate logarithms and	• the perpendicular	tendency and enread to	Make modelling	
	exponentials if required	from the centre to	cendency and spread to	assumptions as appropriate	
techniques to solve	within the solution to a	a chord bisects the	analyse data enectively and		
inequalities	problem	chord	apply to large data sets	<u>Statistical Hypothesis</u>	
	_	• the radius of a		lesting	
Simultaneous equations	Proof	circle at a given	Use regression lines to		
		point on its	estimate values from data	Use a sample to make an	
Solve simultaneous	Apply different methods of	circumference is	and comment on the	inference about the	
equations using a	proof including:	perpendicular to	reliability of these	population	
substitution, elimination or	 Proof by 	the tangent to the	estimates		
graphical technique	exhaustion	circle at that point		Apply the Binomial model	
	 Proof by deduction 		Clean data, including	in hypothesis testing	
Model problems by forming	 Disproof by 		dealing with missing data,		
and solving simultaneous	counterexample	Vectors	errors and outliers	Construct a one tailed or	
equations	and combinations of these			two tailed test.	
	to prove a variety of	Interpret algebraic			
<u>Trigonometry</u>	different theorems and	outcomes geometrically	Probability and Probability	Find the critical region	
	identities		<u>distributions</u>	instead of the p-value and	
Use the symmetries of the		Use vectors to solve		vice versa	
graphs of sine, cosine and	Binomial Expansion	problems in pure	Link to discrete and		
tangent to find multiple	·	mathematics and in	continuous distributions	Accept or reject the null	
solutions to trigonometric	Apply the different forms of	mechanics, for instance		hypothesis.	
equations	the Binomial formula to	with velocities or forces	Use simple, discrete		
	expand Binomials		probability distributions,		
Apply the sine and cosine		Select appropriate methods	including the binomial		
rules to geometrical	Use Pascal's triangle, the	when solving a vector	distribution, as models.		
problems	formula for nCr or the	problem			
	choose function				
		Use a vector diagram to			
		consider resultants			

	Use trigonometric identities	Use Binomial expansions in				
	to solve equations and	approximations				
	prove other identities		Statistical Sampling			
	Use the formula $\frac{1}{2}ab \sin c$		Apply sampling techniques			
	to find the area of a triangle		in the context of solving a			
	5		statistical problem			
	Polynomials and graphs					
	Apply the factor theorem to		Use a sample to draw			
	a range of problems		conclusions about the			
			population			
	Apply graph					
	transformations					
	Use proportional					
	relationships and their					
	graphs					
Kov	Questions will use the	Questions will use the	Questions will use the	Questions will use the	Questions will use the	Questions will use the
Questions	following question stems to	following question stems to	following question stems to	following question stems to	following question stems to	following question stems to
Questions	assess the understanding of	assess the understanding of	assess the understanding of	assess the understanding of	assess the understanding of	assess the understanding of
	the content above.	the content above.	the content above.	the content above.	the content above.	the content above.
				the content above.		
	Evaluate	Evaluate	Evaluate	Evaluate	Evaluate	Evaluate
	Find	Find	Find	Find	Find	Find
	Simplify	Simplify	Simplify	Simplify	Simplify	Simplify
	Express in the form	Express in the form	Express in the form	Express in the form	Express in the form	Express in the form
	Solve	Solve	Solve	Solve	Solve	Solve
	Sketch	Sketch	Sketch	Sketch	Sketch	Sketch
	Justify	Justify	Justify	Justify	Justify	Justify
	Prove that	Prove that	Prove that	Prove that	Prove that	Prove that
		State your modelling		Critique	Critique	
		assumptions.		State your modelling	State your modelling	
				assumptions.	assumptions.	
Accessment	Bacalina tast (CCSE	Topic testing (10 th losson	lune DDEs (at AS standard			
topics	algebraic skills revisited	testing') each fortnight	testing') each fortnight	testing') each fortnight	testing') each fortnight	in Pure Mathematics
topics	through use of GCSE-AS	testing / each fortingit	testing / each fortingit	testing / each for thight	testing / each fortingit	Statistics and Mechanics)
	transition material)					Statistics and Mechanics
	a ansaon materialy					
	Topic testing ('10 th lesson					
	testing') each fortnight					
	0,					

Cross curricular links/ Character Education	Links to Science (indices and solving equations) Aspiration and Challenge, Persistence and Resilience.	Links to Economics, Geography and Science (exponential growth) and Science (use of logarithms)	Links to Geography, History Psychology and Science (Statistical sampling) Links to Science (gradients	Links to Science (S.I. units, kinematics, vector quantities) Links to Geography, History	Links to Science (forces, Newton's Laws of Motion, friction, equilibrium, resultant force)	Links to Science (radian measure) Aspiration and Challenge, Persistence and Resilience.
	Initiative and Confidence,	Understand the difference	and vector quantities)	Psychology and Science	Links to Geography,	Initiative and Confidence,
	Communication and Mutual	between scientific and	Assiration and Challongs	(Data presentation and	Psychology and Science	Communication and Mutual
	Support	mathematical proof	Persistence and Resilience	interpretation)	(Statistical hypothesis	Support
		Aspiration and Challenge,	Initiative and Confidence,	Aspiration and Challenge,	(coung)	
		Persistence and Resilience,	Communication and Mutual	Persistence and Resilience,	Aspiration and Challenge,	
		Initiative and Confidence,	Support	Initiative and Confidence,	Persistence and Resilience,	
		Communication and Mutual		Communication and Mutual	Initiative and Confidence,	
		Support		Support	Communication and Mutual	
					Support	