C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Algebra and Functions	**C2 Mindmap**				
	Prior Knowledge: ☺ *Manipulate algebraic expressions by collecting like terms, multiplying a single term over a bracket, taking out common factors, expand the product of two linear expressions eg (ax ± p)(bx ± q); factorising quadratic expressions including the difference of two squares and cancelling common factors in rational expressions* ☺ *Written method of long division*				
	Simple algebraic division;	*BOTM* Long division		*On Target*	
	Use of the Factor Theorem	*BOTM* Factor Theorem Theorem mix		True, Never, Sometimes; Teacher Notes	*A11 FACTORISING CUBICS*
	Use of the Remainder Theorem	*BOTM* Remainder Theorem I Remainder Theorem II Theorem mix		*Mathsnet Exam Questions*	RISP 11
	Things to make you go hmmmmmm…….				

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Co-ordinate geometry in the (x,y) plane	**Prior Knowledge:** ☺ *Solve quadratic equations by factorisation, completing the square and using the quadratic formula* ☺ *Recall the definition of a circle and the meaning of related terms, including centre, radius, chord, diameter, circumference, tangent, arc, sector and segment* ☺ *Understand that the tangent at any point on a circle is perpendicular to the radius at that point; understand and use the fact that tangents from an external point are equal in length; explain why the perpendicular from the centre to a chord bisects the chord; understand that inscribed regular polygons can be constructed by equal division of a circle; prove and use the facts that the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference, the angle subtended at the circumference by a semicircle is a right angle, that angles in the same segment are equal, and that opposite angles of a cyclic quadrilateral sum to 180 degrees; prove and use the alternate segment theorem* ☺ *Construct the graphs of simple loci, including the circle $x^2 + y^2 = r^2$ for a circle of radius r centred at the origin of coordinates*				
	Coordinate geometry of the circle using the equation of a circle in the form $(x-a)^2 + (y-b)^2 = r^2$ and including the use of the following circle properties: **i) the angle in a semicircle is a right angle;** **ii) the perpendicular from the centre to a chord bisects the chord;** **iii) the perpendicularity of the radius and tangent.**	BOTM *Completing the square* Circles I Circles II	Completing the square song 1 Completing the square song 2 *Dizzy; Teacher Notes* *Matching Cards Teacher Notes*	*On Target* *Treasure Hunt; Teacher Notes* True, Never, Sometimes; Teacher Notes *Mathsnet Exam Questions*	RISP 9 RISP 15 **NRich** Orthogonal Circle Baby Circle
	Things to make you go hmmmmmm…….				

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Sequences and series	**Prior Knowledge:** ☺ *Multiply and divide fractions* ☺ *Generate common integer sequences (including sequences of odd or even integers, squared integers, powers of 2, powers of 10, triangular numbers)* ☺ *Generate terms of a sequence using term-to-term and position-to-term definitions of the sequence* ☺ *Plot graphs of the exponential function $y = k^x$ for integer values of x and simple positive values of k* ☺ *Manipulate algebraic expressions by collecting like terms, multiplying a single term over a bracket, taking out common factors, expand the product of two linear expressions eg (ax ± p)(bx ± q); factorising quadratic expressions including the difference of two squares and cancelling common factors in rational expressions*				
	The sum of a finite geometric series; the sum to infinity of a convergent geometric series, including the use of |r|<1	BOTM Identifying GPs Geometric progressions *Infinite sums* Pocket Money Scam EXCEL Pocket Money	Introducing Sequences and Series Introducing GP - Powers of 10 *TRIO; Teacher Notes* *Proof Unjumble* GP Loop Kangaroo Love; Teacher Notes Does 0.9999… = 1? Do the GS Conga	*On Target* True, Never, Sometimes; Teacher Notes *Treasure Hunt; Teacher Notes*	N13 ANALYSING SEQUENCES RISP 14 RISP 20 **NRich** Clickety Click and All the Sixes

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
	Binomial expansion of $(1+x)^n$ for a positive integer n. **The notations of n! and $\binom{n}{r}$**	BOTM Notation Binomial Expansion I Binomial Expansion II *MUM Binomial Expansion*	The 'Nice' Lottery Pascal and the Lottery *Coefficient Loop*	*Mathsnet Exam Questions* **NRich** Tens (proofs use Bimomial Theorem and other methods) Summit Binomial	
Things to make you go hmmmmmm…….					

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Trigonometry	**Prior Knowledge:** ☺ *Find circumferences of circles and areas enclosed by circles, recalling relevant formulae* ☺ *Calculate the lengths of arcs and the areas of sectors of circles* ☺ *Understand, recall and use Pythagoras' theorem in 2D, then 3D problems* ☺ *Understand, recall and use trigonometrical relationships in right-angled triangles, and use these to solve problems, including those involving bearings, then use these relationships in 3D contexts, including finding the angles between a line and a plane (but not the angle between two planes or between two skew lines)* ☺ *Calculate the area of a triangle using ½ a b sin C* ☺ *Draw, sketch and describe the graphs of trigonometric functions for angles of any size, including transformations involving scalings in either or both the x and y directions* ☺ *Use the sine and cosine rules to solve 2D and 3D problems*				
	The sine and cosine rules; Area of a triangle = ½absinC	*BOTM* Sine and Cosine Rules	What is trig? Area of a Triangle Song Sine Rule Song	*On Target*	RISP 24 **NRich** Cosines Rule Hexi-metry (cosine rule) Pythagoras for a Tetrahedron (cosine rule, area formula)
	Radian measure, including use for arc length and area of sector.	Maths 2 ∞ + beyond *BOTM* Radians Circle Problems		True, Never, Sometimes; Teacher Notes	RISP 23 **NRich** Pericut Quadarc
	Sine, cosine and tangent functions. Their graphs, symmetries and periodicity.	GSP Trig graphs AUTOGRAPH Transforming Graphs, Teacher Notes Plotting Trig Functions	The Unit Circle *TRIO (Graphs); Teacher Notes*		A12 EXPLORING TRIGONOMETRICAL GRAPHS RISP 29

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
	Knowledge and use of tanx = sinx/cosx and $\sin^2\theta + \cos^2\theta = 1$.	BOTM Graphs Common Angles I Common Angles II MUM Basic Trig Basic angles (radians) Basic angles(degrees)	Graphs Special Angles Special Angles Match Teacher Notes *Trig Loop Degrees* *Trig Loop Radians* Happy Families; Teacher Notes		
	Solution of simple trigonometric equations in a given interval.	BOTM Solving Equations I Solving Equations II	Trig Snap Unjumble easy Unjumble hard ; Teacher notes *TRIO (10 versions!); Teacher Notes* Follow on Cards (Degrees); Teacher Notes Follow on Cards (Radians); Teacher Notes Trig Equation Hierachy Trig song	*Treasure Hunt (Degrees); Teacher Notes* *Treasure Hunt (Radians) Teacher Notes* Ivor Cocked Up; Teacher Notes Cue Cards Teacher Notes *Mathsnet Exam Questions*	
	Things to make you go hmmmmmm…….				

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Exponentials and Logarithms	**Prior Knowledge:** ☺ *Mental methods to recall integer squares from 2 * 2 to 15 * 15 and the corresponding square roots, the cubes of 2, 3, 4, 5 and 10, the fact that $n^0 = 1$ and $n^{-1} = 1$ divided by n for positive integers n [for example, $10^0 = 1$; 9^{-1} = one-ninth] , the corresponding rule for negative numbers [for example, $5^{-2} = 1$ divided by 5^2 = one-twenty-fifth] , n to the power half = square root n and n to the power one-third = cube root n for any positive number n [for example, 25 to the power half = 5 and 64 to the power one-third = 4]* ☺ *Plot graphs of the exponential function $y = k^x$ for integer values of x and simple positive values of k* ☺ *Use index laws to simplify and calculate the value of expressions involving multiplication and division of integer powers, zero powers, fractional and negative powers (C1)*				
	$y = a^x$ and its graph	BOTM Exponential graphs EXCEL Pocket Money AUTOGRAPH $y = a^x$;Teacher Notes Maths 2 ∞ + beyond Indices	Asian Tsunami/Pocket Money Scam Starter Problems *Graph Loop* Exponent Song	*On Target* True, Never, Sometimes; Teacher Notes	

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
	The laws of logarithms	BOTM Logarithm Laws Changing bases MUM Log laws	History - John Napier *TRIO; Teacher Notes* Evaluating Log Loop; Teacher Notes Evaluating Log Follow on; Teacher Notes Musical Logs; Teacher Notes Match your logs; Teacher Notes Proof of the laws; Student sheet *Log Laws Loop I; Loop 2 Teacher Notes* ATM 1955 Solution		*A13 SIMPLIFYING LOGARITHMIC EXPRESSIONS* RISP 31 **NRich** Log On
	The solution of equations of the form $a^x = b$	BOTM *Logarithmic equations* *Exponential equations* Harder equations	*'Simple' Follow on; Teacher Notes* Horrid equations Horrid Loop & Teacher Notes Answers Hard Follow on;	*Treasure Hunt; Teacher Notes* Ivor Cocked Up; Teacher Notes *Mathsnet Exam Questions*	**NRich** Log Attack How many?
			Things to make you go hmmmmmm…….		

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Differentiation	**Prior Knowledge:** ☺ *Generate points and plot graphs of simple quadratic functions [for example, $y = x^2$; $y = 3x^2 + 4$] , then more general quadratic functions [for example, $y = x^2 - 2x + 1$]* ☺ *Plot graphs of more complex quadratic and cubic functions; estimate values at specific points, including at maxima and minima* ☺ *Differentiation of x^n and related sums and differences.* ☺ *Applications of differentiation to gradients, tangents and normals.*				
	Applications of differentiating to maxima and minima and stationary points, increasing and decreasing functions.	BOTM Stationary Points Maxima and Minima Healthy Chips *Increasing and decreasing* Rollercoaster 1 Rollercoaster 2 Maths 2 ∞ + beyond	Maxmin Investigation; Teacher notes Happy Mother's Day; Teacher Notes *TRIO; Teacher Notes* Chip or Wedge	*On Target* True, Never, Sometimes; Teacher Notes *Mathsnet Exam Questions*	C2 FUNCTIONS INVOLVING FRACTIONAL AND NEGATIVE POWERS C3 MATCHING FUNCTIONS WITH DERIVATIVES *C5 - FINDING STATIONARY POINTS OF CUBIC FUNCTIONS* RISP 6 RISP 7 **NRich** Witch of Agnesi

Things to make you go hmmmmmm…….

C2 (EDEXCEL)

Topic	Objectives	ICT Resources including Bring on the Maths (BOTM) Match Up Maths (MUM)	GlosMaths Resources	Assessment	Success For All and other resources
Integration	**Prior Knowledge:** ☺ *Indefinite integration as the reverse of differentiation* ☺ *Integration of x^n.* ☺ *Find areas of shapes made from triangles, rectangles, parallelograms and trapezia*				
	Evaluation of definite integrals.	Maths 2∞ + beyond BOTM *Definite Integration I* Definite Integration II		*On Target*	
	Interpretation of the definite integral as the area under a curve.	BOTM Evaluating areas I Evaluating area I Harder Integration I	FTC vs Summation Area under a curve practical Teacher Notes *Matching Cards; Teacher Notes*	*Treasure Hunt Teacher Notes*	RISP 25 NRich Area L
	Approximation of area under a curve using the trapezium rule.	*BOTM* Trapezium Rule I Trapezium Rule II Trapezium Rule III	Why is the area below the axis negative? *The Severn Tunnel Problem Teacher Notes*	True, Never, Sometimes; Teacher Notes *Mathsnet Exam Questions*	
	Things to make you go hmmmmmm…….				

Formulae that students are expected to remember and that may not be included in formulae booklets.

Laws of logarithms

$$\log_a x + \log_a y \equiv \log_a (xy)$$

$$\log_a x - \log_a y \equiv \log_a \left(\frac{x}{y}\right)$$

$$k \log_a x \equiv \log_a \left(x^k\right)$$

Trigonometry

In the triangle ABC

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

area = $\frac{1}{2} ab \sin C$

Area

Area under a curve $= \int_a^b y \, \mathrm{d}x \quad (y \geq 0)$