

Stage 11H		
Topics		
Half Term 1	Algebraic Fractions	Simplify simple algebraic Fractions Cancel Algebraic Fractions where the numerator or denominator require factorising Solve simple equations involving Algebraic Fractions Solve more complex problems that result in a Quadratic. Equations should include solutions that need to be solved by;
	Circle Theorems 2	Angles in the same segment are equal Angles subtended by a diameter are 90 degrees. Angle subtended at the centre is twice the angle subtended at the circumference Opposite angles in a cyclic quadrilateral are equal The angle between a radius and a tangent is 90 degrees Alternate Segment Theorem The 2 tangents diagram Be able to prove the Circle Theorems step by step. Solve Geometric problems involving use of the circle theorems Set up proofs using the circle theorems and other angle facts. Make connections between Circle theorems and;
	Coordinates and Graphs S11	Plot and solve all graphs of; $y = \sin x$ $y = \cos x$ $y = \tan x$ $x^2 + y^2 = r^2$ Recognise Translations and Reflections of Trig Graphs Find the equation of the radius of a circle. Find the equation of the tangent of a circle.
	Algebra Review	Review: Quadratics, Rearranging and Identities
Half Term 2	Functions and Transformations	Understand Function Notation Substitute into a formula using function notation and understand why this is beneficial. Given $f(x)$, be able to find $f(x) + 1$ and $f(x+1)$ and understand; a) that these are different b) that these represent different translations of $f(x)$ Given $f(x)$, be able to find $f(-x)$ and $-f(x)$ and understand; a) that these are different b) that these represent different reflections of $f(x)$ Given $f(x)$, be able to find $f(2x)$ and $2f(x)$ and understand; a) that these are different b) that these represent different stretches of $f(x)$ * Given 2 functions $f(x)$ and $g(x)$ be able to find; a) $fg(x)$ and $gf(x)$ and appreciate these are different. b) Know and understand the term "Composite Function" c) $f^{-1}(x)$ (the inverse function of $f(x)$) Translate and Reflect functions, including Trig functions. See the connection between completing the Square and translating a graph by a vector.
	Algebraic Proof	Know the difference between a formula, an equation, an expression and an Identity Be able to solve problems involving linear and quadratic identities Be able to show counter proof arguments. Be able to work with algebraic formulae and expressions including complex algebraic fractions. Be able to use algebra to provide basic proofs
	Inequalities 3	Solve linear inequalities in one or two variables. Solve quadratic inequalities in one variable. Use set notation. Represent the solution set on a number line and graph.
	Ratio and Proportion	Apply knowledge of ratio and proportion to solve problems.

Trigonometry 4	<p>Know the labelling conventions for non-right angled triangles</p> <p>Derive the sine rule</p> <p>Know the cosine rule (and have seen the derivation).</p> <p>Identify when the sine (cosine) rule is needed to solve a problem</p> <p>Set up and use the sine (cosine) rule to find a missing side in a non-right angled triangle</p> <p>Set up and use the sine (cosine) rule to find a missing length in a non-right angled triangle</p> <p>Recognise the ambiguous case when using the sine rule</p> <p>Solve problems involving bearings</p> <p>Find the area of a Triangle from 2 sides and the included angle</p>
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Half Term 3	Numerical Methods	<p>Know how to use at iterative (recursive) formula</p> <p>Be able to set up basic recursive formulae</p> <p>Know how to get a solution to a set number of decimal places</p>
	Further area	Solve problems involving areas, this can include reverse problems, equating areas of 2 shapes to problem solve, ratio, similarity.
	Vectors	<p>Be able to draw position vector on a grid</p> <p>Multiply a Vector by a scalar</p> <p>Add and Subtract vectors and draw the resultant</p> <p>Solve basic Vector Geometry problems</p> <p>Solve more complex Vector Geometry problems</p> <p>Understand when vector are linear multiples they are parallel</p> <p>Understand when Vectors are Co-linear</p> <p>be able to find the magnitude of vectors</p>

Half Term 4	Vectors	CONTINUING FROM HALF TERM 4
	Area under a curve and rates of change.	<p>Know the difference between Scalar and Vector quantities.</p> <p>Find the area under a VT graph (Displacement) when the graph is;</p> <ul style="list-style-type: none"> - made up of straight lines - made up of curves which can be approximated as straight lines <p>Plot use and interpret</p> <ul style="list-style-type: none"> - Distance time graphs - Speed (velocity) time graphs - Financial graphs??? <p>Interpret Gradient as a rate of change (e.g. Acceleration on a VT Graph) and understand that;</p> <ul style="list-style-type: none"> - a tangent represents an "instantaneous acceleration" at that moment. - the gradient of the line between 2 points represents the average acceleration during the period.
	Revision.	