

Subject: Maths **Year** 10 **Ability** Higher

Half Term 3 / weeks	Week 1-2	Week 3-4	Week 5-6	
Topic	Unit 19 - Circle theorems	Unit 20 - Bearings and constructions	Unit 21 - Quadratics	Reteach and Retention
Topic overview	To recall and apply angle skills including in proof, applying them to circle theorems and then applying these theorems further.	To understand how mathematical constructions are used to improve accuracy and how these skills can be used in modelling of the real world.	To recall linear equation work and apply this to a quadratic setting understanding the link between equations and graphs.	Focus on the process of reteach and retention, knitting together the learning in reaction to the assessments completed
Pupils will learn...				
Components	<ul style="list-style-type: none"> To prove and use angle theorems in circles. To prove and use circle theorems involving tangents. To use the alternate segment theorem. 	<ul style="list-style-type: none"> To draw and measure bearings. To construct triangles using a protractor and compass. To construct a perpendicular bisector. To construct an angle bisector. To construct given angles. To construct a regular hexagon inside a circle. To solve problems involving loci. 	<ul style="list-style-type: none"> To plot quadratics using a table of values To solve quadratic equations by factorising. To use the quadratic formula. To complete the square. To sketch quadratic curves showing key points. To factorise and sketch quadratic inequalities to determine the region needed. 	Staff complete a program of adaptive reteaching on specific topics based on the individual/class needs within their groups. Regular assessments are used to identify gaps in learning. Any gaps found are then addressed in lessons to help support learning and retention. Clear areas for improvement are monitored by individual staff and at a departmental level.
What pupils should already know (prior learning components)	Students should have practical experience of drawing circles with compasses. Students should recall the words, centre, radius, diameter and circumference. Students should recall the relationship of the gradient between two perpendicular lines. Students should be able to find the equation of the straight line, given a gradient and a coordinate.	Students should be able to measure and draw lines. Students should know angle facts (around a point, parallel lines). Students will be familiar with communicating these properties mathematically.	Students can substitute into, solve and rearrange linear equations. Students should be able to factorise simple quadratic expressions - coefficient of x^2 is equal to 1.	All the half term content will have been covered by this point. Staff will use departmental tracking documents to analyse the gaps in learning from the most recent assessments and all previous assessments. The ability to structure and breakdown a problem-solving question as exemplified in the TFI questions throughout the course.
Transferrable knowledge (skills)	Confidence use of proof and the used of pre proved mathematics is how modern mathematics works. This skill to match existing knowledge to unknown problems stating the rules being used returns repeatedly in mathematics at KS5 through skills such as identities in trig.	Real life application of bearings and exact drawings is a useful life skill in itself but this unit will be frequently used in other angle property questions. In harder angle questions bearing is often added to make the question more challenging with a focus on three figure bearings.	Maths a higher level will frequently use quadratics so a good grounding now is essential for students to develop. The cross use of these skills will be used in solving graphical questions as well as quadratic simultaneous equations. At KS5 this will be used in a number of different ways where this ability to "pick" a suitable way to solve will become a imbedded skill.	This activity should serve to highlight and address areas of weakness in teaching and learning or retention. This early intervention to understand specific key areas for improvement or development. This should help to build confidence and improve students' ability to answer these and directly sequential problems.
Key vocabulary pupil will know and learn	Radius, centre, tangent, circumference, diameter, gradient, perpendicular, reciprocal, coordinate, equation, substitution, chord, triangle, isosceles,	Construct, circle, arc, sector, face, edge, vertex, two-dimensional, three-dimensional, solid, elevations, congruent, angles, regular, irregular,	Quadratic, solution, root, linear, solve, simultaneous, inequality, completing the square, factorise, rearrange, surd, function, solve.	

	angles, degrees, cyclic quadrilateral, alternate, segment, semicircle, arc, theorem.	bearing, degree, bisect, perpendicular, loci, map, scale, plan, region.		
Assessment activities	Year 10 Test 9 Homework 19 Circle Theorems	Year 10 Test 9 Homework 20 Bearings and constructions	Year 10 Test 9 Homework 2 Quadratics	AFL and adaptive teaching will continue to support staff to assess the address areas.
Resources available	Maths Watch Clip 183, 184	Maths Watch Clip 46, 47, 145, 146, 147, 165	Maths Watch Clip 98, 99, 157, 191, 209	Before any assessments are completed, revision and guidance materials are provided for students to assist in independent study.
Notes Why this topic is important...	Students should use known angle-based skills in circle theorems that have been shared with them both algebraically and with numbers. A focus on explanation is essential with students explaining their reasoning. This unit finishes with students correctly identifying the needed theorem and applying them and eventually showing these through proof.	The unit starts with angles at a point, on a line and between parallel lines being used in bearings before adding the element of scale drawings. Students the progress to constructions and how this can be used in diagrams to identify regions applying mathematic skills to answer problems.	Quadratics draws on numerous earlier skills and knowledge that have been covered and joins them together. This is the first pure maths topic that students meet that starts to join together these different skills allowing for a deeper understanding of “why” these earlier topics were used. Students should understand the advantages/disadvantages of different methods and how and when to pick them. The unit will finish requiring students to draw/sketch a graph using the algebra to fill in more information.	This is an important point in the curriculum plan that enables individual teachers to review the gaps in learning for the classes they teach. The half-termly assessments are used to track students’ progress and enable teachers to react quickly to any gaps in knowledge and prepare students for the next assessment. The feedback and modelling of the exam answers enables students to pick up exam techniques and the ability to communicate effectively.