

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

Half Term 2 / weeks	Week 1-2	Week 3-4	Week 5-6	
Topic	Unit 16 – Formula, Equations and Identity	Unit 17 – Pythagoras	Unit 18 – Solving Equations	Reteach and Retention
Topic overview	To recall algebra skills building into changing the subject including factorisations. To understand and use mathematical proof including recurring decimals	To recall and use Pythagoras’ theorem in a range of contexts for different styles of questions before extending these questions to include trig.	To recall algebraic manipulation but now to use it in the context of fractions. Use these and simpler skills to solve linear simultaneous equation before using them again within the iterative method.	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 know the difference between a formula, equations and identity. To rearrange simple formulae To rearrange complex formulae. To substitute positive and negative values into expressions. To substitute fractions and decimals into expressions. Algebraic proof To use algebraic proof to convert recurring decimals into fractions. 	<ul style="list-style-type: none"> To use Pythagoras' theorem in two dimensions. To find the length of a line segment given coordinates. To use trigonometry to find missing side lengths in right angled triangles. To use trigonometry to find missing angles in right angled triangles. To use Pythagoras' theorem and trigonometry to solve problems. 	<ul style="list-style-type: none"> To be able to add and subtract algebraic fractions To form and solve two simultaneous equations To use a trial and improvement method to find a solution to complex equation To use an iteration technique to find a solution, or a root of a problem. 	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)	Pupils will need to show they are able to solve linear equations to go forward and rearrange equations/formulas. They will also need strong algebraic manipulation skills (simplifying, expanding, factorising) to go onto proof. Pupils will need to be able to spot relationships between numbers	Students should be confident at squaring, square rooting numbers and rearranging equations. Pupils will also need to be able to round their values to given decimal places or significant figures. Students will also need to be able to understand inverse operations when taught sin, cos and tan	Students should be confident at manipulating algebraic expressions - expanding and simplifying brackets. Students should also be able to add/subtract fractions confidently to be able to apply this to algebraic fractions	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)	Algebraic skills of manipulation and substitution will be used constantly through the curriculum through KS4 and beyond including in the next unit. The recap of fractions and decimals will also further confidence. Mathematical proof forms a huge wing of further mathematics and the logic and rigour here will be built upon.	This topic will use students’ knowledge and understanding of squaring and use of formulae and then extend this to increasing difficult problems requiring students to visualise and assess the validity of answers. This will be used again later in 3D questions The trig aspects will be used in graphical questions and in exact values for trig.	Simultaneous equations underpin numerous elements in both pure and applied areas of KS5 so this knowledge will be required to be embedded. To help with this not only is it taught now but it will also be further developed later when quadratic simultaneous equations are undertaken. Iteration, although a stand-alone topic at GCSE will be used again at KS5 and is useful her to help develop student algebra skills in context of harder problems.	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	Identity, Formulae, Equations, Rearrange, Subject, Linear, Substitute,	Pythagoras, Coordinates, Lengths, Missing side, Longest side, Shortest side,	Algebraic fractions, Numerator, Denominator, Express, Simplify, Solving, Simultaneous equations, Formulae,	
Assessment activities	Year 10 Half Term Test 8 Homework 16 – Formula, Equations and Identity	Year 10 Half Term Test 8 Homework 17 – Pythagoras	Year 10 Half Term Test 8 Homework 18 – Solving Equations	AFL and adaptive teaching will continue to support staff to assess the address areas.
Resources available	MathsWatch clips: 95, 101, 136, 189, 190, 193	MathsWatch clips: 150, 168, 173	MathsWatch clips: 162, 179, 180, 210	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 start this unit with significant algebraic skills but now start to use them in more abstract forms. The use of factorising an unknown should be stressed before looking to introduce proof either algebraically first and then in the context of recurring decimals or visa versa. The importance of not using numbers to prove mathematically should be stressed as students move toward a large corner stone of higher level maths,.	The real world use of Pythagoras and trig is a significant skill for numerous jobs such as construction and design. This topic looks to build knowledge of the connection of theory and practice in the real world. Students need to understand the different styles of questions that can be asked as well as and understanding of the relevance of that answer. This topic should aim to set up 3D problems as well as harder trig latter in the curriculum.	The unit starts with student increasing the depth of knowledge with algebra before moving to simultaneous equations. Although elimination is likely to be used at this stage a consideration of substitution should be considered to help with quadratic simultaneous equations later. Iterations joins the three skills of rearranging, finding solutions (roots) and repeated substitution to find approximations. This lays grounding for later more accurate mathematical methods looked at in KS5	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.