Mathematics	Y11 Higher	Chapter 17 (N8, A4, A5, A6, A7, A18)	The Bigger Picture: More complex algebra	Lessons 15

Essential Knowledge	Teaching Points
• Rationalise the denominator involving surds; • Simplify algebraic fractions; • Multiply and divide algebraic fractions; • Solve quadratic equations arising from algebraic fraction equations; • Change the subject of a formula, including cases where the subject occurs on both sides of the formula, or where a power of the subject appears; • Change the subject of a formula such as $\frac{1}{f}=\frac{1}{u}+\frac{1}{v}$, where all variables are in the denominators; • Solve 'Show that' and proof questions using consecutive integers (n, $n+1$), squares a^2, b^2, even numbers $2n$, odd numbers $2n+1$; • Use function notation; • Find f(x) + g(x) and f(x) – g(x), 2f(x), f(3x) etc algebraically; • Find the inverse of a linear function; • Know that $f^{-1}(x)$ refers to the inverse function; • For two functions f(x) and g(x), find gf(x). •	• It is useful to generalise $\sqrt{m} \times \sqrt{m} = m$. • Revise the difference of two squares to show why we use, for example, ($\sqrt{3}$ – 2) as the multiplier to rationalise ($\sqrt{3}$ + 2). • Link collecting like terms to simplifying surds (Core 1 textbooks are a good source for additional work in relation to simplifying surds). • Practice factorisation where the factor may involve more than one variable. • Emphasise that, by using the LCM for the denominator, the algebraic manipulation is easier.
Assumed Prior Knowledge/ Links / Interleaving	
• Students should be able to simplify surds. • Students should be able to use negative numbers with all four operations. • Students should be able to recall and use the hierarchy of operations.	
Potential Barriers to Access /Misconceptions	**Opportunities for Reasoning/Problem Solving/Proofs**
• $\sqrt{3} \times \sqrt{3} = 9$ is often seen. • When simplifying involving factors, students often use the 'first' factor that they find and not the LCM.	• Formal proof is an ideal opportunity for students to provide a clear logical chain of reasoning providing links with other areas of mathematics.
Key Mathematical Vocabulary	Rationalise, denominator, surd, rational, irrational, fraction, equation, rearrange, subject, proof, function notation, inverse, evaluate