The Sutton Academy

Knowledge Rich Curriculum Plan

Course/Unit

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
To learn how to use proof by contradiction.	• *Students will know that a contradiction is a disagreement between two statements, which means that both cannot be true.* • *Students will know that to prove a statement by contradiction you start by assuming it is not true, use logical steps to show that this assumption leads to something impossible and write a conclusion on the results.* • *Students will know that they are looking for either a contradiction of the assumption or a contradiction of a fact you know to be true.* • *Students will know that a rational number can be written as a/b, where a and b are integers.* • *Students will know that an irrational number cannot be expressed in the form a/b, where a and b are integers.*		Students need to know how to rearrange formulae. Students need to know properties of numbers such as odd/even. Students need to know that an integer is a whole number. Students need to know how to formulate expressions and equations.	
To learn how to multiply, divide, add and subtract algebraic fractions.	• Students will know how to multiply fractions by cancelling any common factors, then multiply the numerators and multiply the denominators. • Students will know how to divide fractions by multiplying the first fraction by the reciprocal of the second fraction remembering to simplify where possible. • Students will know how to add or subtract two fractions by finding a common denominator and simplifying when possible.		*Students need to know how to add numerical fractions.* *Students need to know how to subtract numerical fractions.* *Students need to know how to multiply numerical fractions.* *Students need to know how to divide numerical fractions.* *Students need to know how to simplify numerical fractions.* *Students need to know how to simplify algebraic fractions.* *Students need to know how to factorise linear and quadratic expressions.*	
To learn how to split a fraction into partial fractions.	• Students will know that partial fractions can be found when a single fraction with two distinct linear factors in the denominator can be split into two separate fractions with linear denominators. • Students will know how to rewrite an algebraic fraction as the sum of two partial fractions and set it up as an identity. • Students will know how to add the partial fractions and simplify the identity by cancelling out the denominators. • Students will know how to substitute values into the equation to eliminate an unknown to find another. • Students will know how to equate coefficients of the equations to produce simultaneous equations to solve to find values. • Students will know how to find the partial fractions when there are more than two distinct linear factors in the denominator.		*Students need to know how to add algebraic fractions.* *Students need to know how to use substitution.* *Students need to know how to solve linear equations.* *Students need to know how to solve simultaneous equations.* *Students need to know how to rearrange formulae.*	
To learn how to write partial fractions using repeated factors.	• Students will know that a single fraction with a repeated linear factor in the denominator can be split into two or more separate fractions. • Students will know how to rewrite an algebraic fraction as the sum of three partial fractions and set it up as an identity which includes the square of the repeated root. • Students will know how to add the partial fractions using the lowest common denominator and simplify the identity by cancelling out the denominators. • Students will know how to use substitution to find two partial fractions and then use the substitution of zero to find the third partial fraction. • Students will know how to use comparing coefficients to find the three partial fractions.		*Students need to know how to add algebraic fractions.* *Students need to know how to use substitution.* *Students need to know how to solve linear equations.* *Students need to know how to solve simultaneous equations.* *Students need to know what a repeated root is and what it represents.* *Students need to know how to rearrange formulae.*	

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
To learn how to use algebraic division to simplify improper fractions.	• Students will know how to identify an algebraic improper fractions as one whose numerator has a degree equal to or larger than the denominator. • Students will know how to use algebraic division to convert an improper fraction to a mixed fraction. • Students will know how to use the relationship F(x)=Q(x)x divisor+remainder and compare coefficients to convert an improper fraction to a mixed fraction. • Students will to know how to write the remainder as a fraction over the whole divisor.		*Students need to know how to divide polynomials.* *Students need to know how to find a remainder of an algebraic division.* *Students need to know how to compare coefficients.* *Students need to know set up an algebraic division.*	
To learn how to use algebraic division to simplify fractions in order to find partial fractions.	• Students will know how to identify an algebraic improper fractions in a partial fractions question. • Students will know that an improper fraction must be converted to a mixed fraction before you can express it in partial fractions. • Students will know how to use algebraic division or comparing coefficients to convert an improper fraction to a mixed fraction. • Students will know how to split the resulting fraction using the remainder into partial fractions.		Students need to know how to divide polynomials. Students need to know how to find a remainder of an algebraic division. Students need to know how to compare coefficients. Students need to know how to split single fractions into partial fractions.	

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Students will know how to use the trapezium rule to approximate integration.	• Students will know that if you cannot integrate a function algebraically, you can use a numerical method to approximate the area beneath a curve. • Students will know that to approximate the area given by $\int_a^b ydx$ you can divide the area into n equal strips. Each strip will be of width h where $h = \frac{b-a}{n}$ • Students will know that $\int_a^b ydx \approx \frac{1}{2}h(y_0 + 2(y_1 + y_2 \dots + y_{n-1}) + y_n)$ where $h = \frac{b-a}{n}$ and $y_i = f(a + ih)$ • Students will know if there answer is an overestimate (convex) or underestimate.		Students will need to know the area of a trapezium. Students will need to know how to substitute into a formula Students will need to know how to use radians.	