



The Sutton Academy

Knowledge Rich Curriculum Plan

Course/Unit



Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
<p>To learn how to find and use nth terms of arithmetic sequences.</p>	<ul style="list-style-type: none"> • <i>Students will know that in an arithmetic sequence, the difference between consecutive terms is constant.</i> • <i>Students will know how to use the nth term formula for an arithmetic sequence where a is the first term and d is the common difference.</i> • <i>Students will know how to use the nth term of a sequence to generate terms in the sequence.</i> • <i>Students will know how to use terms in the sequence and an nth term with unknowns to find the nth term of the sequence.</i> 		<p>Students need to know how to find the nth term of a sequence. Students need to know how to substitute values into expressions and formulae. Students need to know how to solve equations. Students need to know how to use simultaneous equations.</p>	
<p>To learn how to find the sum of an arithmetic sequence.</p>	<ul style="list-style-type: none"> • <i>Students will know that an arithmetic series is the sum of the terms of an arithmetic sequence.</i> • <i>Students will know how to find the sum of a sequence of numbers without formulae.</i> • <i>Students will know how to find the sum of a sequence of numbers with the formula where a is the first term and d is the common difference.</i> • <i>Students will know how to find the sum of a sequence of numbers with the formula where a is the first term and l is the last term.</i> • <i>Students will know how to prove the formula for the first n terms of an arithmetic sequence.</i> • <i>Students will know how to find the least number of terms required to exceed a given sum.</i> 		<p><i>Students need to know how to substitute values into formulae.</i> <i>Students need to know how to rearrange formulae.</i> <i>Students need to know how to form an equation.</i> <i>Students need to know how to solve quadratic equations.</i> <i>Students need to know how to factorise expressions.</i> <i>Students need to know how to solve inequalities.</i> <i>Students need to know how to collect like terms.</i></p>	
<p>To learn how to find and use the nth term of a geometric sequence.</p>	<ul style="list-style-type: none"> • <i>Students will know that a geometric sequence has a common ratio between consecutive terms.</i> • <i>Students will know how to find the nth term of a geometric sequence where a is the first term and r is the common ratio.</i> • <i>Students will know how to use the nth term formula to generate terms of a geometric sequence.</i> • <i>Students will know how to use terms in the sequence and an nth term with unknowns to find the nth term of the sequence.</i> • <i>Students will know how to use consecutive terms to find the common ratio of a sequence and use it to find the nth term.</i> • <i>Students will know how to find the first term in a geometric sequence to exceed a given value.</i> 		<p><i>Students need to know how to collect like terms.</i> <i>Students need to know how to solve linear and quadratic equations.</i> <i>Students need to know how to factorise expressions.</i> <i>Students need to know how to solve simultaneous equations.</i> <i>Students need to know how to use logarithms to solve exponential equations.</i> <i>Students need to know how to solve inequalities.</i> <i>Students need to know how to rearrange formulae.</i> <i>Students need to know how to substitute into expressions or equations.</i></p>	
<p>To learn how to find the sum of a geometric sequence.</p>	<ul style="list-style-type: none"> • <i>Students will know that a geometric series is the sum of the terms of a geometric sequence.</i> • <i>Students will know how to find the sum of a geometric series using the formula where a is the first term in and r is the common ratio.</i> • <i>Students will know which formula to use if $r > 1$ or if $r < 1$.</i> • <i>Students will know how to prove the formula for the first n terms of a geometric sequence.</i> • <i>Students will know how to find the least number of terms required to exceed a given sum.</i> 		<p><i>Students need to know how to use logarithms to solve exponential equations.</i> <i>Students need to know how to solve linear and quadratic equations.</i> <i>Students need to know how to factorise expressions.</i> <i>Students need to know how to substitute into expressions or equations.</i> <i>Students need to know how to rearrange formulae.</i> <i>Students need to know how to how to use two consecutive terms to find the common ratio.</i></p>	

Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
To learn how to find the sum to infinity of a geometric sequence.	<ul style="list-style-type: none"> Students will know that in a geometric sequence as n tends to infinity, the sum of the series is called the sum to infinity. Students will know that when the terms of geometric series increase it is called a divergent series. Students will know that when the terms of geometric series decrease it is called a convergent series. Students will know that a geometric series is convergent if and only if $-1 < r < 1$, where r is the common ratio. Students will know how to use the sum to infinity of a convergent geometric series. Students will know how to determine if a series is divergent or convergent. Students will know how to use the sum to infinity and one term to find the common ratio of a sequence. 		<p><i>Students need to know how to substitute into expressions or equations.</i></p> <p><i>Students need to know how to rearrange formulae.</i></p> <p><i>Students need to know how to solve simultaneous equations.</i></p> <p><i>Students need to know how to solve equations.</i></p>	
To learn how to use sigma notation.	<ul style="list-style-type: none"> Students will know that the Greek capital letter 'sigma' is used to signify a sum. Students will know the limits written on the top and bottom of the sigma are to show which terms you are summing. Students will know how to use sigma notation to find the first value, the common ratio or difference and the total amount of terms. Students will know how to use sigma notation to find the sum of a series. Students will know how to use sigma notation to find the sum between any given terms of a series. 		<p><i>Students need to know how to substitute into expressions or equations.</i></p> <p><i>Students need to know how to find the sum of an arithmetic series.</i></p> <p><i>Students need to know how to find the sum of a geometric series.</i></p> <p><i>Students need to know how to find the sum to infinity of a geometric series.</i></p>	
To learn how to use recurrence relations.	<ul style="list-style-type: none"> Students will know that a recurrence relation can be written if the rule to get from one term to the next in a sequence is known. Students will know that the recurrence relation defines each term of a sequence as a function of the previous term. Students will know how to use a recurrence formula to generate a sequence. Students will know how to use sigma notation involving sigma notation. Students will know how to determine if a sequence is increasing or decreasing using recurrence relations. Students will know that a sequence is periodic if the terms repeat in a cycle. 		<p>Students need to know how to substitute into expressions or equations.</p> <p>Students need to know how to use the nth term of a sequence to generate a sequence.</p> <p>Students need to know how to use the nth term of a sequence to find any term in the sequence.</p> <p>Students need to know how to use sigma notation.</p>	
To learn how to model with sequences and series.	<p>Students will know how to model real-life problems using sequences and series.</p> <p>Students will know how to identify if a problem is arithmetic or geometric.</p> <p>Students will know how to generate a sequence from a real-life problem.</p> <p>Students will know how to find the nth term of sequence from a real-life problem.</p> <p>Students will know how to find the sum of a series from a real-life problem.</p> <p>Students will know how to calculate the sum to infinity from a real-life problem.</p> <p>Students will know how to state assumptions or limitations of a problem.</p>		<p>Students need to know how to find the nth term of an arithmetic sequence.</p> <p>Students need to know how to find the nth term of a geometric sequence.</p> <p>Students need to know how to find the sum of an arithmetic series.</p> <p>Students need to know how to find the sum of a geometric series.</p> <p>Students need to know how to find the sum to infinity of a geometric series.</p> <p>Students need to know how to generate a sequence from an nth term.</p> <p>Students need to know how to use substitution.</p>	

<p>Students will know how to use the trapezium rule to approximate integration.</p>	<ul style="list-style-type: none"> • 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 $\int_a^b y dx$ 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 $\int_a^b y dx \approx \frac{1}{2}h(y_0 + 2(y_1 + y_2 \dots + y_{n-1}) + y_n)$ where $h = \frac{b-a}{n}$ and $y_i = f(a + ih)$ • Students will know if there answer is an overestimate (convex) or underestimate. 		<p>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.</p>	
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