

Goals



By the end of this fortnight, you should be able understand and apply arithmetic and geometric sequences and series

- General Patterns (concepts common to all patterns)
- Notation used in topic
- Geometric Progressions (nth term, sum to nth term, using both graphical and algebraic representations)
- Geometric Progressions – applications and sum to infinity
- Arithmetic and Geometric Progressions – graphical representations

Theoretical Components

Resources:

Text book reference: **Maths Quest Further Maths 12 Chapter 5** (See pdf on Google Drive)

YouTube - Sal Khan Introducing Geometric Sequences <http://youtu.be/pXo0bG4iAyg>

<http://www.mathsisfun.com/algebra/sequences-sums-geometric.html>

<http://www.examsolutions.net/maths-revision/core-maths/sequences-series/geometric/sum-to-infinity/tutorial-1.php>

Formulas

Sequences and Series

Arithmetic Sequences

$$\text{nth Term: } t_n = a + (n - 1)d$$

$$\text{Sum: } S_n = \frac{n}{2}(a + t_n) \text{ or } S_n = \frac{n}{2}[2a + (n - 1)d]$$

Geometric Sequences

$$\text{nth Term: } t_n = ar^{n-1}$$

$$\text{Sum: } S_n = \frac{a(1-r^n)}{1-r} \quad S_\infty = \frac{a}{1-r}$$

Practical Components

Do the following questions from **Chapter 5 – Arithmetic and geometric sequences** (pdf – GC). Organise your solutions neatly in your exercise book.

Ex 5D Recognition of geometric sequences

- Q's 9, 10, 13 – 16

Ex 5E Finding the terms of a geometric sequence

- Q's 1 (a,f), 4 (a), 5 (b), 16 – 20

Ex 5F The sum of a given number of terms of a geometric sequence

- Q's 1 (a), 3 (a), 8 – 11

Ex 5G Applications of geometric sequences

- Q's 1, 3, 5, 7, 9, 12, 13

Ex 5H Finding the sum of an infinite geometric sequence

- Q's 4 (a,e,g,h), 5, 7, 9

Ex 5I Contrasting arithmetic sequences and geometric sequences through graphs

- Q's 5 (a,b), 9, 10

Investigation

See the following page

QFO

Quiz/Forum/Other

Complete the task on **Mathspace** – Arithmetic and geometric sequences and series

Remember to check-in with your teacher each lesson and get your name marked off.

MM2 Week 5/6 Investigation

1. The batteries in a toy soldier are running down. The toy soldier marches 50 cm in the first minute, 30 cm in the second minute, 18 cm in the next and so on. By how much does the toy soldier fall short of marching 1.5m?

2. The sum of infinity of a geometric sequence is twice the sum of the first two terms. Find possible values of the common ratio.