

Arithmetic Sequences

An arithmetic sequence has a **common difference**

$$\begin{array}{c}
 +3 \quad +3 \quad +3 \\
 \curvearrowright \quad \curvearrowright \quad \curvearrowright \\
 1, 4, 7, 10, \dots, 1 \times (n - 1) \times 3
 \end{array}$$

$$\begin{array}{c}
 +d \quad \quad +d \quad \quad +d \\
 \curvearrowright \quad \quad \curvearrowright \quad \quad \curvearrowright \\
 U_1, U_1 + d, U_1 + 2d, U_1 + 3d, \dots, U_1 + (n - 1)d
 \end{array}$$

The n th term of an arithmetic sequence, $U_n = U_1 + (n - 1)d$

Series

A series is formed when we add terms together: $1 + 4 + 7 + 10$

We can find the sum of this series using the formulae

$$S_n = \frac{n}{2}(U_1 + U_n), \quad \text{useful when we know } U_n$$

$$S_n = \frac{n}{2}(2U_1 + (n - 1)d), \quad \text{useful when we don't know } U_n$$

Solving Problems with GDC

You can make good use of your graphical calculator to find out how many terms there are in a sequence. The table function is particularly useful:

NORMAL FLOAT AUTO REAL RADIAN MP	
Plot1	Plot2
$Y_1 = X/2(2*28+(X-1)*(-3))$	
$Y_2 =$	
$Y_3 =$	
$Y_4 =$	
$Y_5 =$	
$Y_6 =$	
$Y_7 =$	
$Y_8 =$	
$Y_9 =$	

NORMAL FLOAT AUTO REAL RADIAN MP	
PRESS + FOR Δ tbl	
X	Y1
11	143
12	138
13	130
14	119
15	105
16	88
17	68
18	45
19	19
20	-10
21	-42

X=20