6.2 Arithmetic Sequences

An arithmetic sequence, or arithmetic progression, is a sequence in which the terms increase or decrease by a common difference, *d*.

d = common difference

$a_1 = u_1$ = initial amount (first number)

Ex) 8, 11, 14, 17 .... $u_1 = 8$ $d = 3$

Ex) $c, 2c, 3c, 4c$ .... $u_1 = c$ $d = +c$

For any Arithmetic Sequence $u_n = u_{n-1} + d$, the General Formula for the nth term is $u_n = u_1 + d(n-1)$

Ex) Find the 25th term of the sequence
13, 19, 25 . . . .

$u_1 = 13$
$d = 6$

$u_n = \underline{13} + \underline{6}(n-1)$

$u_{25} = 13 + 6(25-1)$

$u_{25} = 157$

Ex) In an arith. seq. $u_9 = 48$ and $u_{12} = 75$. Find the 1st term and the common diff.

$u_{12} = u_9 + d_{10} + d_{11} + d_{12}$

$75 = 3d + 48$

$27 = 3d$

$9 = d$

$u_9 = u_1 + d(9-1)$

$48 = u_1 + 9(8)$

6C p. 167 1-4