Arithmetic Sequence

An arithmetic sequence is a sequence that forms a pattern by the same nonzero number by adding or subtracting.

An arithmetic sequence forms a linear function b/c of the constant rate of change or common difference.

$$a_n = a_1 + (n-1)(d)$$

D: common difference
N: term we are finding
a_1: 1st Term

Ex) 9, 13, 17, 21, ..., 25, 29, 33
(+4, +4, +4) $d = 4$

Ex) $-\frac{3}{4}, -\frac{1}{4}, \frac{1}{4}, \frac{3}{4}, \ldots, \frac{5}{4}, \frac{7}{4}, \frac{9}{4}$
$d = \frac{1}{2}$

Ex) The $25^{(n)}$ term; $a_1 = -5$, $d = -2$

$a_{25} = -5 + (25-1)(-2)$

$a_{25} = -53$

Ex) Find the 16th term: 4, 8, 12, 16, ...

+4 +4 +4

$d = 4$

$n = 16$

$a_1 = 4$

$a_{16} = 4 + (16-1)(4)$

$a_{16} = 64$

Ex) Find the 60th term: 11, 5, -1, -7

-6 -6 -6

$d = -6$

$n = 60$

$a_1 = 11$

$a_{60} = 11 + (60-1)(-6)$

$a_{60} = -343$

Ex) Find the "nth" term: 13, 23, 33, 43, ...

+10 +10 +10

$d = 10$

$n = n$

$a_1 = 13$

$a_n = 13 + (n-1)(10)$

$= 13 + 10n - 10$

$a_n = 3 + 10n$

Ex) Find the "nth" term: -31, -34, -37, -40, ...

-3 -3 -3

$d = -3$

$n = n$

$a_1 = -31$

$a_n = -31 + (n-1)(-3)$

$= -31 + -3n + 3$

$a_n = -3n - 28$