

Arithmetic sequence

The n^{th} term of an arithmetic sequence

$$u_n = u_1 + (n-1)d$$

The sum of n terms of an arithmetic sequence

$$S_n = \frac{n}{2}(2u_1 + (n-1)d) = \frac{n}{2}(u_1 + u_n)$$

Examples of arithmetic sequence

1, 3, 5, 7

2, 6, 10, 14

80, 60, 40, 20

u_n is the n^{th} term

d is the common difference

$d = u_2 - u_1$ OR $u_{n+1} - u_n$

S_n is sum of n terms

1. For the arithmetic sequence,
56, 63, 70, 77, 84

Find

- (a) u_1
- (b) u_2
- (c) common difference
- (d) Numbers of term

2. For the following arithmetic sequence,

17, 9, 1, -7, -15, -23, -31

Find

(a) u_1

(b) u_2

(c) common difference

(d) Numbers of term

List the terms

1. Consider the sequence defined by $u_n = 7n - 2$.

List the first four terms of the sequence.


2. Consider the sequence defined by $u_n = 10n + 2$

List the first four terms of the sequence.

4. In an arithmetic sequence, the second term is 29 and the fourth term is 39.


- (a) Find the common difference.
- (b) Find u_1 .
- (c) Find u_n .

Paper 1 exercise

1.  An arithmetic sequence has the first term $ln a$ and a common difference $ln 3$.


The 13th term in the sequence is $8ln 9$. Find the value of a .

Paper 2 exercise

1.  In an arithmetic sequence $u_1 = 7$, $u_{20} = 64$ and $u_n = 3790$.

(a) Find the value of the common difference.

(b) Find the value of n .

3.  In an arithmetic series, $u_1 = -7$ and $S_{20} = 620$.
- (a) Find the common difference.
- (b) Find the value of u_{78} .
