

# Arithmetic Series

56 min  
57 marks

1. In an arithmetic sequence,  $u_1 = 2$  and  $u_3 = 8$ .
- (a) Find  $d$ . (2)
- (b) Find  $u_{20}$ . (2)
- (c) Find  $S_{20}$ . (2)
- (Total 6 marks)**
2. Consider the arithmetic sequence 2, 5, 8, 11, ....
- (a) Find  $u_{101}$ . (3)
- (b) Find the value of  $n$  so that  $u_n = 152$ . (3)
- (Total 6 marks)**
3. In an arithmetic sequence  $u_{21} = -37$  and  $u_4 = -3$ .
- (a) Find
- (i) the common difference;
- (ii) the first term. (4)
- (b) Find  $S_{10}$ . (3)
- (Total 7 marks)**
4. Let  $u_n = 3 - 2n$ .
- (a) Write down the value of  $u_1$ ,  $u_2$ , and  $u_3$ . (3)
- (b) Find  $\sum_{n=1}^{20} (3 - 2n)$ . (3)
- (Total 6 marks)**

5. Let  $S_n$  be the sum of the first  $n$  terms of an arithmetic sequence, whose first three terms are  $u_1$ ,  $u_2$  and  $u_3$ . It is known that  $S_1 = 7$ , and  $S_2 = 18$ .

- (a) Write down  $u_1$ .
- (b) Calculate the common difference of the sequence.
- (c) Calculate  $u_4$ .

**(Total 6 marks)**

6. Find the sum of the arithmetic series  $17 + 27 + 37 + \dots + 417$ .

**(Total 4 marks)**

7. An arithmetic series has five terms. The first term is 2 and the last term is 32. Find the sum of the series.

**(Total 4 marks)**

8. The  $n^{\text{th}}$  term of an arithmetic sequence is given by  $u_n = 5 + 2n$ .

- (a) Write down the common difference.
- (b) (i) Given that the  $n^{\text{th}}$  term of this sequence is 115, find the value of  $n$ .
- (ii) For this value of  $n$ , find the sum of the sequence.

**(1)**

**(5)**

**(Total 6 marks)**

9. Consider the arithmetic sequence 3, 9, 15, ..., 1353.

- (a) Write down the common difference.
- (b) Find the number of terms in the sequence.
- (c) Find the sum of the sequence.

**(1)**

**(3)**

**(2)**

**(Total 6 marks)**

10. An arithmetic sequence,  $u_1, u_2, u_3, \dots$ , has  $d = 11$  and  $u_{27} = 263$ .

- (a) Find  $u_1$ .
- (b) (i) Given that  $u_n = 516$ , find the value of  $n$ .
- (ii) For this value of  $n$ , find  $S_n$ .

**(2)**

**(4)**

**(Total 6 marks)**