

1. The first four terms of an arithmetic sequence are shown below.

1, 5, 9, 13,.....

- (a) Write down the n^{th} term of the sequence.
(b) Calculate the 100th term of the sequence.
(c) Find the sum of the first 100 terms of the sequence.

(Total 4 marks)

2. The fourth term of an arithmetic sequence is 12 and the tenth term is 42.

- (a) Given that the first term is u_1 and the common difference is d , write down two equations in u_1 and d that satisfy this information.

(b) Solve the equations to find the values of u_1 and d .

(Total 8 marks)

3. Consider the following sequence:

57, 55, 53 . . . , 5, 3

- (a) Find the number of terms of the sequence.
(b) Find the sum of the sequence.

(3)

(3)

(Total 6 marks)

4. The first term of an arithmetic sequence is 7 and the sixth term is 22. Find
- (a) the common difference; (2)
 - (b) the twelfth term; (2)
 - (c) the sum of the first 100 terms. (2)
- (Total 6 marks)**

5. Given the arithmetic sequence: $u_1 = 124, u_2 = 117, u_3 = 110, u_4 = 103, \dots$
- (a) Write down the common difference of the sequence. (1)
 - (b) Calculate the sum of the first 50 terms of the sequence. (2)
- u_k is the first term in the sequence that is negative.
- (c) Find the value of k . (3)
- (Total 6 marks)**

6. The natural numbers: 1, 2, 3, 4, 5... form an arithmetic sequence.
- (a) State the values of u_1 and d for this sequence. (2)
 - (b) Use an appropriate formula to show that the sum of the natural numbers from 1 to n is given by $\frac{1}{2} n(n+1)$. (2)
 - (c) Calculate the sum of the natural numbers from 1 to 200. (2)
- (Total 6 marks)**

7. The fifth term of an arithmetic sequence is 20 and the twelfth term is 41.
- (a) (i) Find the common difference. (2)
- (ii) Find the first term of the sequence. (1)
- (b) Calculate the eighty-fourth term. (1)
- (c) Calculate the sum of the first 200 terms. (2)
- (Total 6 marks)**

8. The first three terms of an arithmetic sequence are
- $$2k + 3, 5k - 2 \text{ and } 10k - 15.$$
- (a) Show that $k = 4$. (3)
- (b) Find the values of the first three terms of the sequence. (1)
- (c) Write down the value of the common difference. (1)
- (d) Calculate the 20th term of the sequence. (2)
- (e) Find the sum of the first 15 terms of the sequence. (2)
- (Total 9 marks)**

9. The first five terms of an arithmetic sequence are shown below.

2, 6, 10, 14, 18

- (a) Write down the sixth number in the sequence.
(b) Calculate the 200th term.
(c) Calculate the sum of the first 90 terms of the sequence.

(Total 8 marks)

10. The n^{th} term of an arithmetic sequence is given by $u_n = 63 - 4n$.

- (a) Calculate the values of the first two terms of this sequence.

(2)

- (b) Which term of the sequence is -13 ?

(2)

- (c) Two consecutive terms of this sequence, u_k and u_{k+1} , have a sum of 34. Find k .

(3)

(Total 7 marks)

11. The sixth term of an arithmetic sequence is 24. The common difference is 8.

- (a) Calculate the first term of the sequence.

The sum of the first n terms is 600.

- (b) Calculate the value of n .

(Total 8 marks)