1. 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)

2. 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 100^{th} term of the sequence.

(c) Find the sum of the first 100 terms of the sequence.

(Total 4 marks)

3. 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 200^{th} term.

(c) Calculate the sum of the first 90 terms of the sequence.

(Total 8 marks)

4. Consider the arithmetic sequence 1, 4, 7, 10, 13, …

(a) Find the value of the eleventh term.

(2)

(b) The sum of the first n terms of this sequence is $\frac{n}{2}(3n - 1)$.

(i) Find the sum of the first 100 terms in this arithmetic sequence.

(ii) The sum of the first n terms is 477.

(a) Show that $3n^2 - n - 954 = 0$.

(b) Using your graphic display calculator or otherwise, find the number of terms, n.

(6)
(Total 8 marks)

5. A concert choir is arranged, per row, according to an arithmetic sequence. There are 20 singers in the fourth row and 32 singers in the eighth row.

(a) Find the common difference of this arithmetic sequence.

(3)

There are 10 rows in the choir and 11 singers in the first row.

(b) Find the **total** number of singers in the choir.

(3)
(Total 6 marks)

6. 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)

There are 10 rows in the choir and 11 singers in the first row.

(b) Find the **total** number of singers in the choir.

(3)
(Total 6 marks)

7. The first term of an arithmetic sequence is 3 and the sum of the first two terms is 11.

(a) Write down the second term of this sequence.

(1)

(b) Write down the common difference of this sequence.

(1)

(c) Write down the fourth term of this sequence.

(1)

(d) The n^{th} term is the first term in this sequence greater than 1000.
Find the value of n.

(3)
(Total 6 marks)

8. Consider the following sequence:

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

(a) Find the number of terms of the sequence.

(3)

(b) Find the sum of the sequence.

(3)
(Total 6 marks)

9. Given the arithmetic sequence: $u_1 = 124$, $u_2 = 117$, $u = 110$, $u_4 = 103$, …

(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)

10. 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)

11. 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 20^{th} term of the sequence.

(2)

(e) Find the sum of the first 15 terms of the sequence.

(2)

(Total 9 marks)

12. 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)

13. 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)