Section 2: Arithmetic sequences and series

Exercise level 1

1. What is the common difference of each of the following arithmetic series:
   (i) $1 + 3 + 5 + 7 + 9 + 11 + \ldots + 17 + 19$
   (ii) $5 + 10 + 15 + 20 + \ldots + 195 + 200$
   (iii) $50 + 46 + 42 + \ldots + 14 + 10$

2. How many terms are there in each of the following arithmetic series:
   (i) $1 + 3 + 5 + 7 + 9 + 11 + \ldots + 17 + 19$
   (ii) $5 + 10 + 15 + 20 + \ldots + 195 + 200$
   (iii) $50 + 46 + 42 + \ldots + 14 + 10$

3. Calculate the total each of the following summations:
   (i) $1 + 3 + 5 + 7 + 9 + 11 + \ldots + 17 + 19$
   (ii) $5 + 10 + 15 + 20 + \ldots + 195 + 200$
   (iii) $50 + 46 + 42 + \ldots + 14 + 10$

4. Find the 15^{th} term of the arithmetic sequence $-12, -5, 2, 9, \ldots$

5. Find the sum of the first 50 odd numbers.

6. The first term of an arithmetic sequence is 2 and the common difference is 4.
   (i) Find the 8^{th} term.
   (ii) Find the sum of the first 10 terms.
   (iii) The last term is 278. How many terms are there in the sequence?

7. An arithmetic sequence has 15 terms. The first term is 30 and the last term is –12.
   (i) Find the common difference.
   (ii) Find the sum of the terms of the sequence.

8. Find the sum of the series $2 + 5 + 8 + \ldots + 92$.

9. An arithmetic sequence has first term 12, and the third term is 26.
   (i) Find the common difference.
   (ii) Find the sum of the first 15 terms.

10. Find the sum of the series $123 + 117 + 111 + \ldots\ldots\ldots\ldots -57$.