Arithmetic Sequences and Series

Practice Worksheet (Edexcel IGCSE 4MA1 November 2023 1H Style)

I Do

Here are the first 4 terms in an arithmetic sequence.

3 7 11 15

The last term of the sequence is x.

The sum of the terms of the sequence is 7260.

Find the value of x.

Show clear algebraic working.

We Do

Here are the first 4 terms in an arithmetic sequence.

5 8 11 14

The last term of the sequence is x.

The sum of the terms of the sequence is 2540.

Find the value of x.

Show clear algebraic working.

You Do

Here are the first 4 terms in an arithmetic sequence.

2 8 14 20

The last term of the sequence is x.

The sum of the terms of the sequence is 3640.

Find the value of x.

Show clear algebraic working.

Challenge

The n-th term of an arithmetic sequence is given by $T_n = 5n - 2$.

(a) Show that the sum of the first n terms is $S_n = n/2 \times (5n + 1)$.

(b) The sum of the first n terms is 366. Find n and the last term x.

(c) A second arithmetic sequence has first term 3 and common difference d.

The sum of its first 12 terms is 432. Find d.

Worked Answers

I Do

$a = 3$, $d = 4$. Set $n/2 \times [6 + 4(n - 1)] = 7260$.

This gives $2n^2 + n - 7260 = (2n + 121)(n - 60) = 0$.

The positive root is $n = 60$. Therefore $x = 3 + 59 \times 4 = 239$.

We Do

$a = 5$, $d = 3$. Set $n/2 \times [10 + 3(n - 1)] = 2540$.

The positive root is $n = 40$. Therefore $x = 5 + 39 \times 3 = 122$.

You Do

$a = 2$, $d = 6$. Set $n/2 \times [4 + 6(n - 1)] = 3640$.

The positive root is $n = 35$. Therefore $x = 2 + 34 \times 6 = 206$.

Challenge

(a) $a = 3$ and $d = 5$, so $S_n = n/2 \times [6 + 5(n - 1)] = n/2 \times (5n + 1)$.

(b) $5n^2 + n - 732 = (5n + 61)(n - 12) = 0$, so $n = 12$ and $x = 58$.

(c) $6(6 + 11d) = 432$, so $66d = 396$ and $d = 6$.