

Linear Sequences

Starter

1. **(Review of last lesson)**
Write down the next 5 terms of the Fibonacci sequence that begins 1, 6.
2. **(Review of Y8 material)**
Find the formula for the n th term of the linear sequence 7, 12, 17, 22, 27.

Notes

The formula for the n th term of a linear sequence looks like $an + b$.

In $an + b$:
 a is called the coefficient of n
 b is called the constant term

Success criteria – finding the formula for the n th term of a linear sequence

1. Find the term-to-term rule (i.e. find the 1st differences) – this is the coefficient of n
2. Find the zero—th term (i.e. the term before the 1st term) – this is the constant term

E.g. 1 Find the formula for the n th term of the sequence 1, 8, 15, 22, 29.

Working: Term-to-term rule: $8 - 1 = 7 \Rightarrow 7n$
Term before the first: $1 - 7 = -6$
 $\therefore n$ th term = $7n - 6$

E.g. 2 Find the formula for the n th term of the sequence 5, 2, -1 , -4 , -7 .

E.g. 3 Find the formula for the n th term of the sequence -13 , -15 , -17 , -19 , -21 .

E.g. 4 Find the missing terms in the following linear sequences:

(a) 7, __, 13, 16, __ (b) __, 9, __, __, 27

Working: (a) Term-to-term rule: $16 - 13 = 3$
So the two missing terms are 10, 19

Once we have the formula for the n th term, it is easy to calculate any term in the sequence.

E.g. 5 Find the 13th term in the sequence given by the formula $25 - 15n$.

E.g. 6 Decide whether the number 386 is in the sequence 4, 10, 16, 22, 28.
Hint: find the formula for the n th term

Video: [nth term for linear sequences](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p389 M12.8 Qu 1ace..., 2, 3, 4, 5, 6, 7, 10, 12, 13, 8, 9
A*-G class textbook: p351 M12.7 Qu 2ace..., 3, 4, 6, 7, 8, 9, 10, 12, 14, 11
9-1 homework book: p131 M12.8 Qu 1-8
A*-G homework book: p98 M12.7 Qu 1-6

Summary

The formula for the n th term of a linear sequence looks like $an + b$.

Finding the formula for the n th term of a linear sequence

1. Find the term-to-term rule (i.e. find the 1st differences) — this is the coefficient of n
2. Find the zero—th term (i.e. the term before the 1st term) — this is the constant term

[Homework book answers \(only available during a lockdown\)](#)