

Why use this resource?

This resource provides opportunity for students to practise manipulation of arithmetic and geometric sequences, but also promotes thinking about the difference between linear and exponential growth.

Possible approach

The four questions in this package should be tackled in order as each one builds on the earlier ones. Students could be asked to work in pairs and share ideas about what is happening, especially if they have not previously encountered oscillating geometric sequences.

When discussing the graphical representation of sequences, take care that students understand that the sequence is represented by the discrete points and that the curve or straight line is just a guide to help the visualisation.

Key questions

- What would the common difference/ratio need to be for this to work?
- Then how could you work out the first term?
- Can you write out the terms of this sequence?
- How are these two sequences related? What do they have in common?

Possible support

Students might find it helpful to write out the terms of sequences they are working with in a grid or table, so that matching terms can more easily be identified.

n	1	2	3	4	...
G_n	8	-4	2	-1	

Possible extension

Can you find any other pairs of geometric and arithmetic sequences with three common terms? For instance,

- Where the geometric sequence is G but the first terms do not match?
- Where the geometric sequence has common ratio $r = -\frac{1}{2}$ but $a \neq 8$?

- Where $a = 1$ and the first, second and fifth terms are in common?
- Where $a = 1$ and the first, second and sixth terms are in common?