

## Mixed Sequences

### Starter

1. (Review of last lesson)

Find an expression in the form  $u_n = an^2 + bn + c$  for the sequence 3, 9, 17, 27, 39.

### Notes

When a sequence is made up of a fraction or two numbers multiplied together, find a formula for the  $n$ -th term for each and then combine the formulae.

**E.g. 1** Find the  $n$ -th term of these sequences:

(a)  $(25 \times 2), (21 \times 4), (17 \times 8), (13 \times 16), \dots$

(b)  $\frac{1}{5}, \frac{4}{7}, \frac{9}{9}, \frac{16}{11}, \dots$

(c)  $(15 \times 1), (10 \times 8), (5 \times 27), (0 \times 64), \dots$

**Working:** (a) The first numbers of the product are: 25, 21, 17, 13, ...  
Term-to-term rule:  $21 - 25 = -4 \Rightarrow -4n$   
Term before the first:  $25 - (-4) = 25 + 4 = 29$   
 $n$ th term is  $29 - 4n$

The second numbers of the product are: 2, 4, 8, 16, ...  
These are the powers of 2 so the  $n$ th term is  $2^n$ .

By combining the sequences, we get  $u_n = (29 - 4n) \times 2^n$

**Video:** [The  \$n\$ th term for fractional sequences](#)

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

### Exercise

9-1 class textbook: p395 E12.3 Qu 1-7  
A\*-G class textbook: No exercise  
9-1 homework book: p134 E12.3 Qu 1-8  
A\*-G homework book: No exercise

### Summary

When a sequence is comprised of two sequences, consider each one individually.

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