



Generating sequences

- Finding term-to-term rules for arithmetic sequences
- Generating a sequence from a term-to-term rule

Keywords

You should know

explanation 1

- 1** Each table shows patterns in a sequence.
Each term in the sequence is the number of squares in the pattern.
Copy and complete each table.

a

Pattern					
Position	1	2	3		
Term	3	5			

b



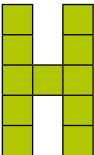
Pattern					
Position	1	2	3		
Term	1	4			

c

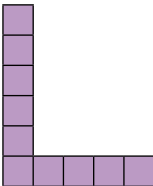
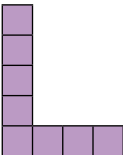
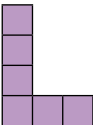
Pattern					
Position	1	2	3		
Term	5	8			

2 Copy and complete the tables to show the first five patterns in each sequence.

a

Pattern					
Position	1	2	3		
Term	3	7			

b

Pattern					
Position	1				
Term	10				

explanation 2

3 Write the term-to-term rule for each of the sequences in questions **1** and **2**.

4 Write the term-to-term rule for each of these arithmetic sequences.

a 2 4 6 8 10

b 1 4 7 10 13

c 5 10 15 20 25

d 9 13 17 21 25

e 0.5 1 1.5 2 2.5

f 3 0 -3 -6 -9

g $\frac{3}{4}$ 1 $\frac{5}{4}$ $\frac{3}{2}$ $\frac{7}{4}$

h 4 1.5 -1 -3.5 -6

5 Write the next two terms in each of the sequences in question **4**.

6 Copy and complete the table.

	1st term	Term-to-term rule	First five terms
	0	+ 3	0, 3, 6, 9, 12
a	2	+ 5	
b	7	+ 4	
c	3	$+\frac{1}{2}$	
d	-6	+ 4	
e	-13	+ 3	
f	8	- 5	
g	4	- 1.5	
h	1	+ 0.3	
i	1	- 0.3	
j	-0.5	+ 0.2	
k	-0.5	- 0.4	
l	$\frac{3}{4}$	$+\frac{1}{4}$	
m	$\frac{2}{3}$	$+\frac{1}{3}$	
n	$-\frac{2}{5}$	$+\frac{1}{5}$	

7 a The first term of a sequence is 5. The term-to-term rule is ‘add 3’.

i What is the second term of the sequence?

ii What is the fifth term?

b The sixth term of a different sequence is 7. The term-to-term rule is ‘subtract 2’.

i What is the fifth term of the sequence?

ii What is the first term?

8 Copy and complete the table.

	1st term	Term-to-term rule	2nd, 3rd, 4th and 5th terms
a	7	+5	
b		+4	9, 13, 17, 21
c			10, 16, 22, 28
d	0	-3	
e	-8		-5, -2, 1, 4
f			0.5, 1.5, 2.5, 3.5
g	1.2	-1	
h	$\frac{1}{2}$	$-\frac{1}{2}$	
i			$\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$
j			$-\frac{1}{4}, -\frac{3}{4}, -1\frac{1}{4}, -1\frac{3}{4}$
k	0.1	+0.01	
l			1.10, 1.15, 1.20, 1.25

explanation 3

9 The first and last terms of some arithmetic sequences are given below.

i Calculate the term-to-term rule for each sequence.

ii Write the missing terms of each sequence.

a 3, , , 12

b 7, , , 25

c 1, , , , 17

d 0, , , , 20

e -3, , , , 17

f -1, , , , , , 11

g 5, , , , -11

h 8, , , , , -12

i 2, , , , , , -28

j 1, , , , , , 4

k 3, , , , , 4

l -1, , , , , , $\frac{1}{2}$