Sequences

- Drawing a dot pattern
- Finding and using a term-to-term rule
- Recognising increasing and decreasing sequences

Keywords

You should know

explanation 1

1 Here is a dot pattern.

a Draw the next two shapes in the pattern.

b What is the rule for this pattern?

c Write this pattern as a sequence.

d What is the name of this sequence of numbers?

***e** Will the number 15 ever be in this sequence? Explain how you know.

2 Repeat question **1** for this dot pattern.

3 Here is a different dot pattern.

a Draw the next two shapes in the pattern.

b What is the rule for this pattern?

c Write this pattern as a sequence of numbers.

***d** Will the number 21 ever be in this sequence? Explain how you know.

4 Repeat question **3** for this dot pattern.

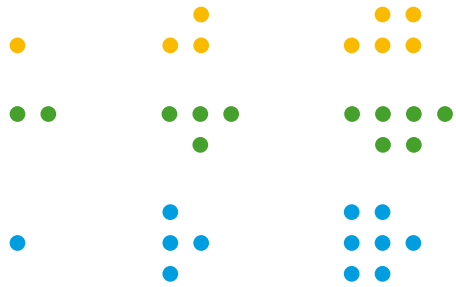
5 Repeat question **3** for this dot pattern.

6 Draw the next dot pattern for each diagram.

a

b

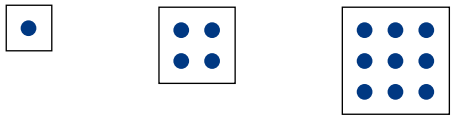
c



7 Draw a dot pattern for the first four terms of each sequence.

a 2, 5, 8, 11 **b** 3, 6, 9, 12 **c** 1, 5, 9, 13

8 In this dot pattern the dots are arranged to make squares.



a Draw the next two shapes in the pattern.

b Write this pattern as a sequence of numbers.

c Describe the shape that has a total of 100 dots.

d Explain why 40 will not be in the sequence.

explanation 2a | explanation 2b | online

9 Write the next two terms of each sequence. Write each term-to-term rule.

a 4, 8, 12, 16, … **b** 5, 10, 15, 20, … **c** 4, 8, 16, 32, …

d 12, 14, 16, 18, … **e** 24, 40, 56, 72, … **f** 27, 24, 21, 18, …

g 79, 68, 57, 46, … **h** 100, 200, 400, 800, … **i** 1, 10, 100, 1000, …

j 318, 338, 358, 378, … **k** 812, 712, 612, 512, … **l** 0, 250, 500, 750, …

10 Which of these sequences are decreasing sequences?

a 4, 8, 12, 16, …
b 20, 15, 10, 5, …
c 4, 8, 16, 32, …
d 12, 14, 16, 18, …
e 24, 40, 56, 72, …
f 27, 24, 21, 18, …
g 75, 64, 53, 42, …
h 10, 20, 40, 80, …
i 1, 10, 100, 1000, …
j 398, 378, 358, 338, …
k 142, 242, 342, 442, …
l 0, 250, 500, 750, …

11 Copy and complete these sequences.

a 1, 3, 5, ☐, 9, ☐
b 2, 4, ☐, 8, 10, ☐
c 3, ☐, 9, ☐, 15, 18, ☐
d 8, ☐, 16, ☐, 24, ☐
e 33, 30, ☐, 24, ☐
f 66, ☐, ☐, 33, ☐, 11
g 1, 6, 11, ☐, 21, ☐
h 4, 7, ☐, 13, 16, ☐
i 2, ☐, 8, ☐, 14, 17, ☐
j 8, ☐, 18, ☐, 28, ☐
k 40, 31, ☐, 13, ☐
l 52, ☐, 44, ☐, 36, ☐

12 Copy and complete this table.

	First term	Term-to-term rule	Next four terms
a	23	Add 4	
b	78	Subtract 6	
c	400	Divide by 2	
d	2	Double and then subtract 1	
e	72	Add 8 and then divide by 2	
f	2	Multiply by 3 and then subtract 3	

***13** Here is a term-to-term rule.

If the number is even divide by 2 but if the number is odd multiply it by 3 and add 1. If the number is 1, stop.

Use the rule above to find the rest of this sequence: 96, 48, 24, …