

Sequences

1. Fill in the next 3 terms of each sequence, then give the term-to-term rule for each one.

a) 15, 21, 27, 33, ____, ____, ____ Term-to-term rule: _____

b) 0, 200, 400, 600, ____, ____, ____ Term-to-term rule: _____

c) 150, 135, 120, ____, ____, ____ Term-to-term rule: _____

d) -3, -1, 1, 3, ____, ____, ____ Term-to-term rule: _____

e) 24, 20, 16, 12, ____, ____, ____ Term-to-term rule: _____

f) 5, -1, -7, -13, ____, ____, ____ Term-to-term rule: _____

g) 24, 19, 14, 9, ____, ____, ____ Term-to-term rule: _____

h) 6, 6.25, 6.5, 6.75, ____, ____, ____ Term-to-term rule: _____

2. Write down the term-to-term rule for each of the following sequences:

a) 25, 40, 55, 70, 85 Term-to-term rule: _____

b) 7, 3, -1, -5, -9 Term-to-term rule: _____

c) 3, 6, 12, 24, 48 Term-to-term rule: _____

d) 5000, 500, 50, 5, 0.5 Term-to-term rule: _____

3. Fill in the missing numbers from these sequences, and give the term-to-term rule:

a) 13, ____, 25, 31, ____, 43 Term-to-term rule: _____

b) ____, 24, ____, 46, 57, 68 Term-to-term rule: _____

c) 18, ____, 38, 48, ____, 68 Term-to-term rule: _____

d) 12, 10, ____, ____, 4, 2 Term-to-term rule: _____

e) ____, 7, ____, 25, 34, 43 Term-to-term rule: _____

f) 18, ____, ____, 30, 34, 38 Term-to-term rule: _____

4. Write the first 5 numbers in the sequences described below:

a) First term: 6, Term-to-term rule: +5 ___ , ___ , ___ , ___ , ___

b) First term: 12, Term-to-term rule: -10 ___ , ___ , ___ , ___ , ___

c) First term: 80, Term-to-term rule: $\div 2$ ___ , ___ , ___ , ___ , ___

d) First term: 2, Term-to-term rule: $\times 10$ ___ , ___ , ___ , ___ , ___

5. Lucas numbers follow a special pattern: Each new term is found by adding the two previous terms. Eg if the first two numbers are 1 and 3, the next will be 4.

a) Work out the next four numbers of the sequence: 1, 3, 4, 7, ___ , ___ , ___ , ___

b) A different sequence follows the same rule: every number is the sum of the two before.

Work out the *first* two numbers of this sequence: ___ , ___ , 10, 16, 26, 42

c) The Fibonacci numbers also follow this rule. Fill in the missing numbers:

___ , 1, ___ , 3, ___ , ___ , 13, 21, ___

6. A square number is one which is the result of multiplying a whole number by itself.

a) Complete the next few numbers in the sequence of square numbers:

Place Number (n)	1	2	3	4	5	6	7	8
Term (n^2)	1	4	9					

b) Try to find a term-to-term rule for the sequence of square numbers. How much do you add to get from one square number to the next?

Sequences SOLUTIONS

1. Fill in the next 3 terms of each sequence, then give the term-to-term rule for each one.

- a) 15, 21, 27, 33, 39, 45, 51 Term-to-term rule: +6
- b) 0, 200, 400, 600, 800, 1000, 1200 Term-to-term rule: +200
- c) 150, 135, 120, 105, 90, 75 Term-to-term rule: -15
- d) -3, -1, 1, 3, 5, 7, 9 Term-to-term rule: +2
- e) 24, 20, 16, 12, 8, 4, 0 Term-to-term rule: -4
- f) 5, -1, -7, -13, -19, -25, -31 Term-to-term rule: -6
- g) 24, 19, 14, 9, 4, -1, -6 Term-to-term rule: -5
- h) 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5 Term-to-term rule: +0.25

2. Write down the term-to-term rule for each of the following sequences:

- a) 25, 40, 55, 70, 85 Term-to-term rule: +15
- b) 7, 3, -1, -5, -9 Term-to-term rule: -4
- c) 3, 6, 12, 24, 48 Term-to-term rule: $\times 2$
- d) 5000, 500, 50, 5, 0.5 Term-to-term rule: $\div 10$

3. Fill in the missing numbers from these sequences, and give the term-to-term rule:

- a) 13, 19, 25, 31, 37, 43 Term-to-term rule: +6
- b) 13, 24, 35, 46, 57, 68 Term-to-term rule: +11
- c) 18, 28, 38, 48, 58, 68 Term-to-term rule: +10
- d) 12, 10, 8, 6, 4, 2 Term-to-term rule: -2
- e) -2, 7, 16, 25, 34, 43 Term-to-term rule: +9
- f) 18, 22, 26, 30, 34, 38 Term-to-term rule: +4

4. Write the first 5 numbers in the sequences described below:

a) First term: 6, Term-to-term rule: +5 6, 11, 16, 21, 26

b) First term: 12, Term-to-term rule: -10 12, 2, -8, -18, -28

c) First term: 80, Term-to-term rule: $\div 2$ 80, 40, 20, 10, 5

d) First term: 2, Term-to-term rule: $\times 10$ 2, 20, 200, 2000, 20000

5. Lucas numbers follow a special pattern: Each new term is found by adding the two previous terms. Eg if the first two numbers are 1 and 3, the next will be 4.

a) Work out the next four numbers of the sequence: 1, 3, 4, 7, 11, 18, 29, 47

b) A different sequence follows the same rule: every number is the sum of the two before.

Work out the *first* two numbers of this sequence: 4, 6, 10, 16, 26, 42

c) The Fibonacci numbers also follow this rule. Fill in the missing numbers:

1, 1, 2, 3, 5, 8, 13, 21, 34

6. A square number is one which is the result of multiplying a whole number by itself.

a) Complete the next few numbers in the sequence of square numbers:

Place Number (n)	1	2	3	4	5	6	7	8
Term (n^2)	1	4	9	16	25	36	49	64

b) Try to find a term-to-term rule for the sequence of square numbers. How much do you add to get from one square number to the next?

Add 3, then 5, then 7, then 9, then 11, etc.

The *sequence of numbers you are adding* starts at 3 and goes up by 2 each time.

Sequences like this are actually much easier to describe using a rule to get straight from the *place number* (how far along) to the *term* (the value you want).

“Square the place number” is the simplest way to describe this sequence. It also means you can find, say, the 10th term in the sequence without working out the previous nine:

$10^2 = 100$, so the 10th term in the sequence is 100.