Number

Sequences

Types of sequences

1 Find the next term in the unusual sequences below:

1a 2, 12, 1112, 1112, 3112, 132112 ...

answer:

1b M, T, W, T, F, S ...

answer:

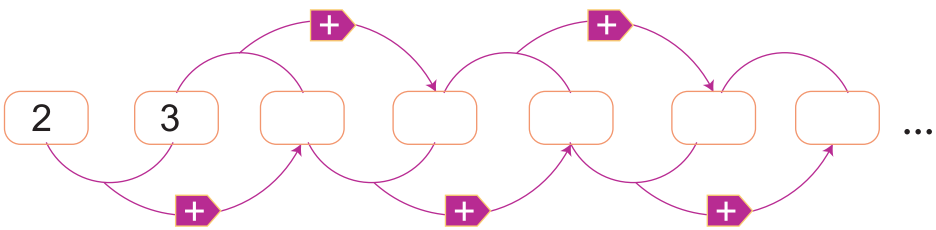
1c O, T, T, F, F, S, S, E, ...

answer:

Fibonacci sequences

2 Write the next five terms of the Fibonacci style sequences that start with:

2a



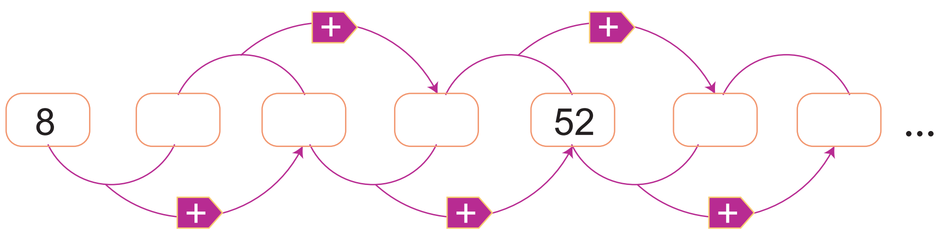
Number

Sequences

2b 3 – 2

2c – 1 1

3 Complete the terms in the Fibonacci style sequence below:



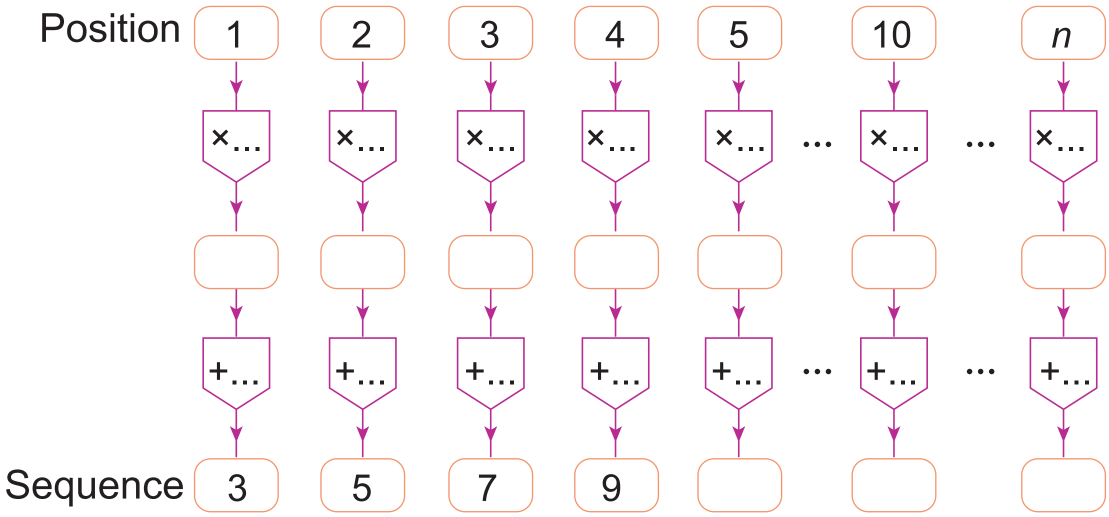
Number

Sequences

Arithmetic sequences

4 For the following sequences find the next term, the 10th term and the nth term.

4a 3, 5, 7, 9 ...



The next term is

The 10th term is

The nth term: $P_n =$

Number

Sequences

4b 10, 17, 24, 31 ...

The next term is $\boxed{}$

The 10^{th} term is $\boxed{}$

The n^{th} term: $P_n =$

Number

Sequences

4c 3, 8, 13, 18 ...

The next term is $\boxed{}$

The 10th term is $\boxed{}$

The nth term: $P_n =$

Number

Sequences

4d 17, 14, 11, 8 ...

The next term is

The 10^{th} term is

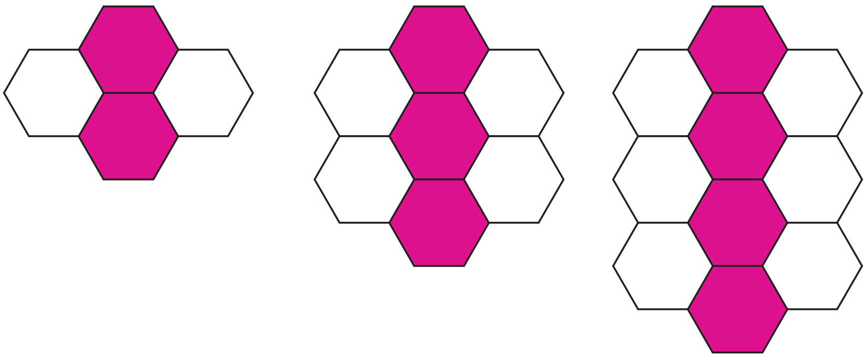
The n^{th} term: $P_n =$

Number

Sequences

The geometry of arithmetic sequences.

5 A sequence is made with white and pink tiles as below.



Complete the table below:

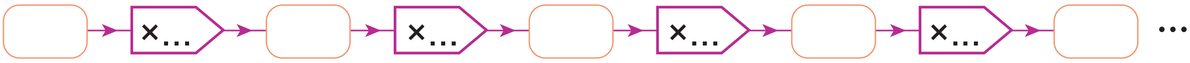
Pattern number	Number of pink tiles	Number of white tiles	Total number of tiles
1			
2			
3			
4			
5			
10			
n			

Number

Sequences

Geometric sequences

6 Find the first five terms of the geometric sequence with
$G_1 = 3$ and $G_{n+1} = 4 \times G_n$



7 State the first term and the common ratio of the following sequences:

7a ..., 18, 54,...

First term:

Common ratio:

7b ..., ..., 36, 54, ...

First term:

Common ratio:

Number

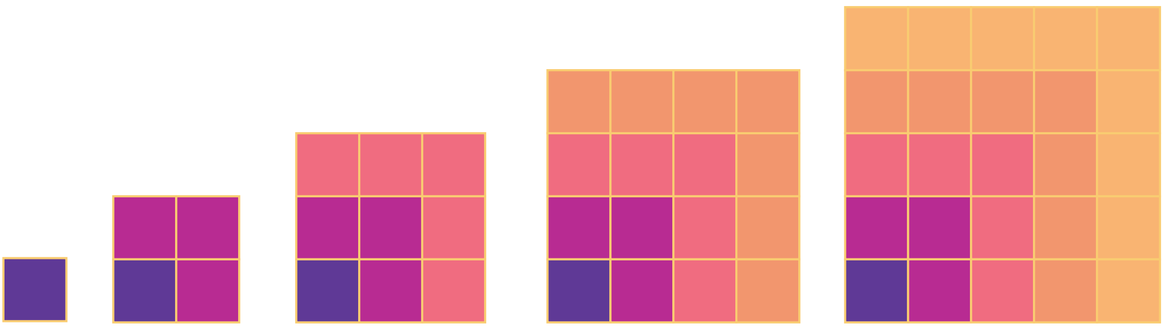
Sequences

7c ..., 10 ..., 250, ...

First term: $\square$ Common ratio: $\square$

Square numbers

Here are some square numbers:



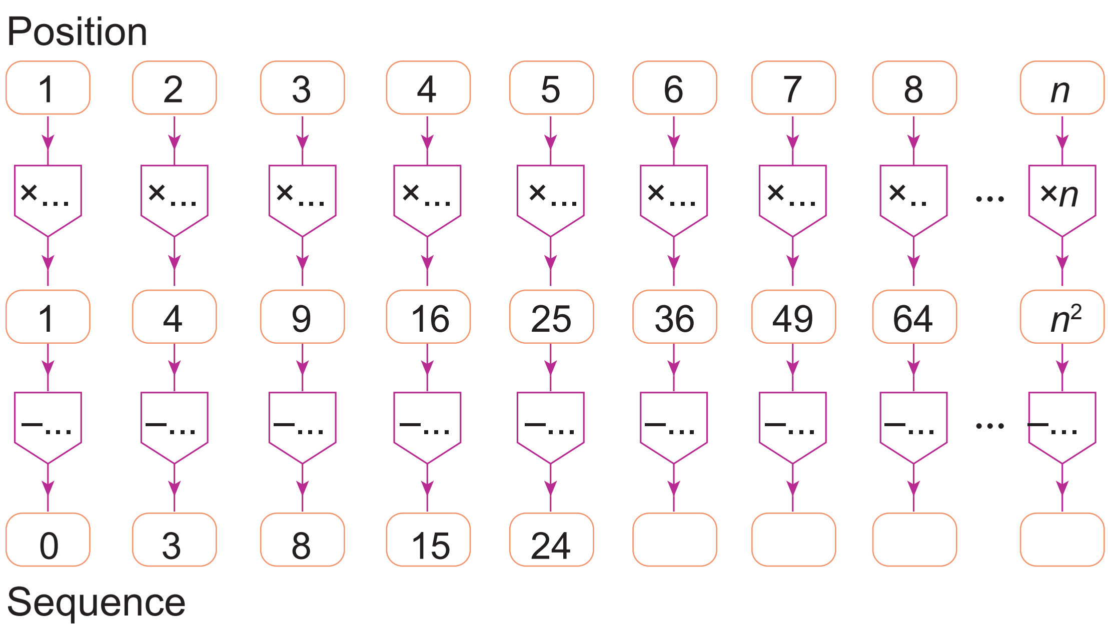
1 4 9 16 25 ...

Number

Sequences

8 Write down the next 3 terms in each of these sequences.
In each case, explain how the sequence is related to the sequence of square numbers 1, 4, 9, 16, 25 ...

8a 0, 3, 8, 15, 24, ...



Answer: ______________________________

Number

Sequences

8b 2, 5, 10, 17, 26

Answer: ____________________

8c 11, 14, 19, 26, 35 ...

Answer: ____________________

Number

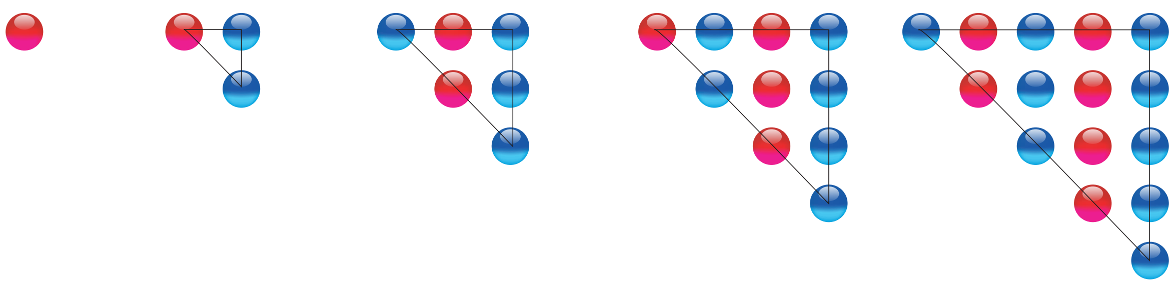
Sequences

8d 6, 9, 14, 21, 30 ...

Answer: ____________________

Triangular numbers

Here are some triangular numbers



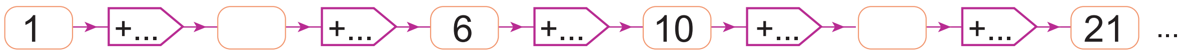
1 **+2** 3 **+3** 6 **+4** 10 **+5** 15 ...

Number

Sequences

9 Write down the missing terms in each sequence.

9a 1, ..., 6, 10,..., 21, ...



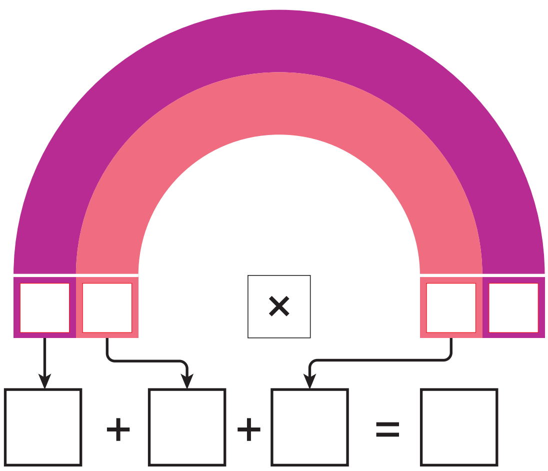
9b 2, 4, 7, ..., ..., ..., 29, ...

9c 1,5, ..., ..., 23, ...

Perfect numbers

10a Complete the factor diagram to show that 6 is a perfect number.

Factors of 6



10b Use a factor diagram to show that 21 is not a perfect number.

Number

Sequences

10c Use a factor diagram to show that 20 is not a perfect number.

10d Show that 19 is not a perfect number.

11 Using any two digit number as a starting point, what is the longest factor chain you can find?

Number

Sequences

Happy numbers

12a Show that 86 is a ‘Happy’ number.

12b Show that 23 is a ‘Happy’ number.

Number

Sequences

12c Show that 7 is a ‘Happy’ number.

12d Show that 21, 11 and 62 are not ‘Happy’ numbers.

