SEQUENCES (LINEAR)

CONTENTS

Worked example	Your turn
Generate the first 5 terms of the sequence with n^{th} term: $2n$: $3n$: $4n-1$: $5n-2$:	Generate the first 5 terms of the sequence with n^{th} term: $6n-5$: $1, 7, 13, 19, 25$

Worked example	Your turn
Generate the first 5 terms of the sequence with n^{th} term:	Generate the first 5 terms of the sequence with n^{th} term:
$-2n + 3$:	$7 - 3n$: $4, 1, -2, -5, -8$
$-3n + 2$:	
$2 - 3n$:	
$5 - 4n$:	

Worked example	Your turn
Find the n^{th} term:	Find the n^{th} term:
$3, 5, 7, 9, \ldots$	$2, 7, 12, 17, \ldots$ $5n - 3$
$4, 7, 10, 13, \ldots$	
$1, 5, 9, 13, \ldots$	

Worked example	Your turn
Find the n^{th} term:	Find the n^{th} term:
$-3, -1, 1, 3, \ldots$	$-9, -4, 1, 6, \ldots$
	$5n - 14$
$0, 3, 6, 9, \ldots$	
$-7, -3, 1, 6, \ldots$	

Worked example	Your turn
Find the n^{th} term: $5, 3, 1, -1, \ldots$ $4, 1, -2, -5, \ldots$ $0, -4, -8, -12, \ldots$	Find the n^{th} term: $3, -2, -7, -12, \ldots$ $-5n + 8$

Worked example	Your turn
Find the 50^{th} term:	Find the 100^{th} term:
$3, 8, 13, 18, \ldots$	$5, 3, 1, -1, \ldots$
	-193
$7, 4, 1, -2, \ldots$	

Worked example	Your turn
$3, 7, 11, 15, \ldots$ The next three terms: n^{th} term: The 50^{th} term: $4, 1, -2, -5, \ldots$ The next three terms: n^{th} term: The 50^{th} term:	$5, 1, -3, -7, \ldots$ The next three terms: n^{th} term: $-4n + 9$ The 50^{th} term: -191

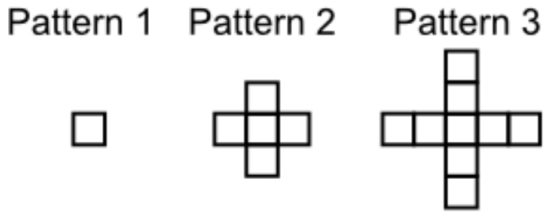
Worked example	Your turn
Is 15 in the sequence with n^{th} term $3n - 2$?	Is 15 in the sequence $2n + 3$? Yes: The 6^{th} term
Is -7 in the sequence $2 - 3n$?	Is -15 in the sequence $3 - 2n$? Yes: The 9^{th} term

Worked example	Your turn
Is 100 in the sequence: $-3, 4, 11, 18, \ldots$?	Is 100 in the sequence: $4, 7, 10, 13, \ldots$? Yes – the 33rd term
Is 10 in the sequence: $127\ 118, 109, 100, \ldots$?	Is 10 in the sequence: $85, 78, 71, 64 \ldots$? No $-7n + 92 = 10$ solves to give $n = \frac{82}{7}$ which is not an integer.

Worked example	Your turn
The first five terms of each sequence are shown. Find two numbers which are in both sequences. $3, 10, 17, 24, 31, \ldots$ $-4, -1, 2, 5, 8, \ldots$	The first five terms of each sequence are shown. Find two numbers which are in both sequences. $2, 7, 12, 17, 22, \ldots$ $-4, -1, 2, 5, 8, \ldots$ $2, 27$

Worked example

Draw the next pattern:

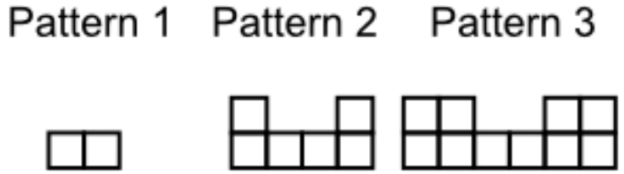


How many squares in the n^{th} pattern?

How many squares in the 50^{th} pattern?

Your turn

Draw the next pattern:



How many squares in the n^{th} pattern? $4n - 2$

How many squares in the 50^{th} pattern? 198

Worked example	Your turn
The nth term of an arithmetic sequence is $7n - 4$. Find the first term and the common difference	The nth term of an arithmetic sequence is $5n - 3$. Find the first term and the common difference First term is 2 Common difference is 5
The nth term of an arithmetic sequence is $4n - 5$. Find the first term and the common difference	

Worked example	Your turn
Find the sum of the first 50 terms the sequence which begins: $7, 10, 13, 16, \ldots$	Find the sum of the first 80 terms the sequence which begins: $2, 6, 10, 14, \ldots$ 12800
Find the sum of the first 100 terms the sequence which begins: $3, 8, 13, 18, \ldots$	

Worked example	Your turn
Find the sum of the first 50 terms the sequence which begins: $10, 7, 4, 1, -2, \ldots$	Find the sum of the first 80 terms the sequence which begins: $18, 14, 10, 8, 2, \ldots$ -11200
Find the sum of the first 100 terms the sequence which begins: $8, 3, -2, -7, -12, \ldots$	

Worked example	Your turn
The first term of an arithmetic sequence is 5. The common difference is 3. Find the:	The first term of an arithmetic sequence is 3. The common difference is 5. Find the:
50^{th} term:	20^{th} term: 98
Sum of the first 50 terms:	Sum of the first 20 terms: 510

Worked example	Your turn
The fifth term of an arithmetic sequence is 9. The twelfth term of the same arithmetic sequence is 23. Find the first term and the common difference.	The third term of an arithmetic sequence is 8. The eleventh term of the same arithmetic sequence is 32. Find the first term and the common difference. First term is 0 Common difference is 4

Worked example	Your turn
The common difference of an arithmetic sequence is 4. The sum of the first 60 terms of this sequence is 7380. Find the first term.	The common difference of an arithmetic sequence is 5. The sum of the first 40 terms of this sequence is 4020. Find the first term. 3

Worked example	Your turn
The common difference of an arithmetic sequence is 4. The sum of the first 60 terms of this sequence is -240. Find the first term.	The common difference of an arithmetic sequence is 5. The sum of the first 40 terms of this sequence is 2620. Find the first term. -32

Worked example	Your turn
The first term of an arithmetic sequence is 3. The sum of the first 50 terms is 2600. Work out the common difference of the sequence.	The first term of an arithmetic sequence is 4. The sum of the first 40 terms is 2500. Work out the common difference of the sequence. 3

Worked example	Your turn
The eighth term of an arithmetic sequence is 11. The fifth term of the same arithmetic sequence is 2. Find the sum of the first 50 terms of this arithmetic sequence.	The tenth term of an arithmetic sequence is 35. The fourth term of the same arithmetic sequence is 17. Find the sum of the first 50 terms of this arithmetic sequence. 4075