Maths

Find the nth term of a quadratic sequence

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Find the nth term of a quadratic sequence

1. a) Generate the first 5 terms of the sequence with nth term $n^2 + 3$

b) Find the 2nd difference.

This table may help.

n		1	2	3	4	5
$n^2 + 3$						
1st difference						
2nd difference						

Find the 2nd difference of sequences with nth term

a) $2n^2 + 1$ b) $3n^2 - 2$

2. Match the pairs.

nth term	2nd difference
$2n^2 - n$	-6
$n^2 + 3n - 7$	4
$4n^2 + 3n$	1
$-3n^2 - 5$	2
$0.5n^2 + n - 1$	8

3. What is the link between the 2nd difference and the n^2 coefficient of the nth term?

Find the nth term of a quadratic sequence

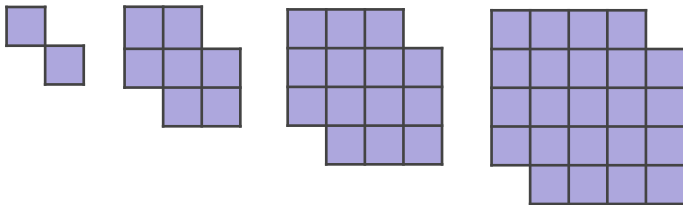4. Find the nth term of these sequences.

a) -7, -4, 1, 8, 17, ...

b) 6, 14, 24, 36, 50, ...

c) 6, 7, 10, 15, 22, ...

d) 1, 10, 25, 46, 73, ...

e) 0, 11, 26, 45, 68, ...

f)
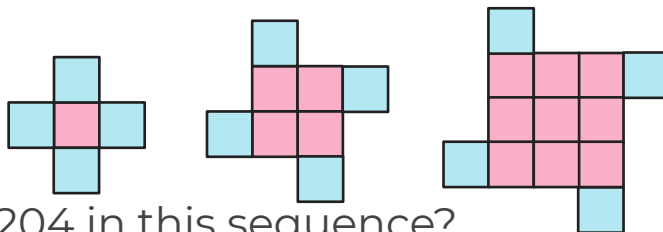

5. Find the nth term of these sequences.

a) 3, 0, -5, -12, -21, ...

b) -2, -4, -8, -14, -22, ...

c) 8, 2, -8, -22, -40, ...

6. What is the nth term for the sequence made by these patterns?

Is 204 in this sequence?

Answers

Find the nth term of a quadratic sequence

1. a) Generate the first 5 terms of the sequence with nth term $n^2 + 3$
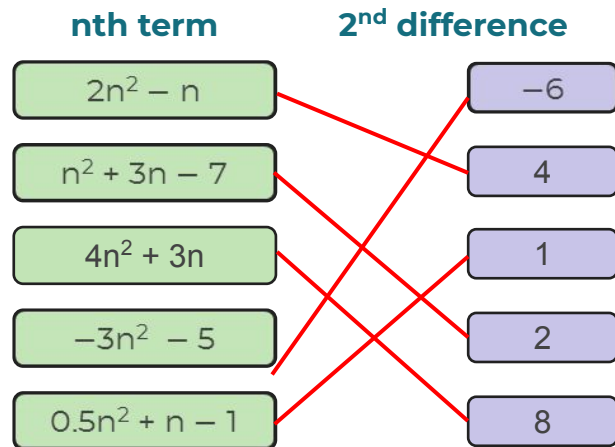
b) Find the 2nd difference.
This table may help.

n	1	2	3	4	5
$n^2 + 3$	4	7	12	19	28
1st difference		3	5	7	9
2nd difference			2	2	2

Find the 2nd difference of sequences with nth term

a) $2n^2 + 1$ 4   b) $3n^2 - 2$ 6

2. Match the pairs.

nth term   **2nd difference**

$2n^2 - n$		-6
$n^2 + 3n - 7$		4
$4n^2 + 3n$		1
$-3n^2 - 5$		2
$0.5n^2 + n - 1$		8

3. What is the link between the 2nd difference and the n^2 coefficient of the nth term? Half of the 2nd difference is the n^2 coefficient.

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Find the nth term of a quadratic sequence
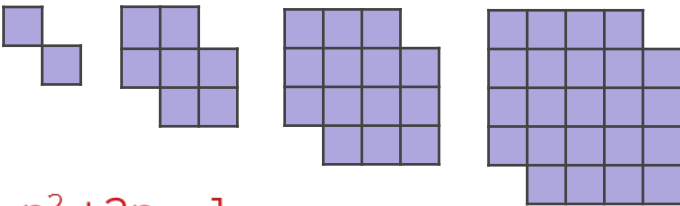
4. Find the nth term of these sequences.

a) -7, -4, 1, 8, 17, ... $n^2 - 8$

b) 6, 14, 24, 36, 50, ... $n^2 + 5n$

c) 6, 7, 10, 15, 22, ... $n^2 - 2n + 7$

d) 1, 10, 25, 46, 73, ... $3n^2 - 2$

e) 0, 11, 26, 45, 68, ... $2n^2 + 5n - 7$
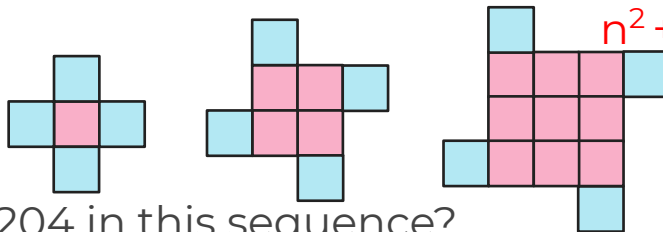
f)

$n^2 + 2n - 1$

5. Find the nth term of these sequences.

a) 3, 0, -5, -12, -21, ... $-n^2 + 4$

b) -2, -4, -8, -14, -22, ... $-n^2 + n - 2$

c) 8, 2, -8, -22, -40, ... $-2n^2 + 10$

6. What is the nth term for the sequence made by these patterns?

$n^2 + 4$

Is 204 in this sequence?

No, because $\sqrt{204 - 4}$ is not an integer