
ALGEBRA: QUADRATIC SEQUENCES**Best Guess Mastery Worksheet (Target Grade 6/7)****I Do**

Here are the first five terms of a quadratic sequence:

2 7 14 23 34

Find an expression, in terms of n , for the n th term of this sequence.

.....

We Do

..... (2)

Arabella writes down the first five terms of a quadratic sequence:

4 11 20 31 44

Find an expression, in terms of n , for the n th term of this sequence.

.....

(2)

ALGEBRA: QUADRATIC SEQUENCES**Best Guess Mastery Worksheet (Target Grade 6/7)****You Do 1**

Doug writes down the first five terms of a quadratic sequence:

0 5 12 21 32

Find an expression, in terms of n , for the n th term of this sequence.

.....

You Do 2

..... (2)

Emily writes down the first five terms of a quadratic sequence:

-2 3 10 19 30

Find an expression, in terms of n , for the n th term of this sequence.

.....

..... (2)

ALGEBRA: QUADRATIC SEQUENCES (ADVANCED)**Best Guess Mastery Worksheet (Target Grade 7/8)****Challenge 1**

Here are the first four terms of a quadratic sequence:

5 14 27 44

- (a) Find an expression, in terms of n , for the n th term of this sequence.
(b) Show that 434 is a term in this sequence, and find its position (term number).

..... (4)

Challenge 2

Steve writes down the first four terms of a quadratic sequence:

-1 4 13 26

- (a) Find an expression, in terms of n , for the n th term of this sequence.
(b) Explain why 500 is not a term in Steve's sequence.

..... (4)

Answers & Worked Solutions

I Do:

1. Differences: 5, 7, 9, 11. Second difference = 2 $\rightarrow$ coefficient of n^2 is 1.
2. Subtract n^2 from sequence (1, 4, 9, 16, 25) $\rightarrow$ 1, 3, 5, 7, 9.
3. Linear remainder 1, 3, 5, 7, 9 has n th term $2n - 1$.
4. Answer: $n^2 + 2n - 1$

We Do:

1. Second difference = 2 $\rightarrow$ coefficient of n^2 is 1.
2. Subtract $n^2 \rightarrow$ 3, 7, 11, 15, 19.
3. Linear remainder has n th term $4n - 1$.
4. Answer: $n^2 + 4n - 1$

You Do 1:

1. Second difference = 2 $\rightarrow$ coefficient of n^2 is 1.
2. Subtract $n^2 \rightarrow$ -1, 1, 3, 5, 7.
3. Linear remainder has n th term $2n - 3$.
4. Answer: $n^2 + 2n - 3$

You Do 2:

1. Second difference = 2 $\rightarrow$ coefficient of n^2 is 1.
2. Subtract $n^2 \rightarrow$ -3, -1, 1, 3, 5.
3. Linear remainder has n th term $2n - 5$.
4. Answer: $n^2 + 2n - 5$

Challenge 1:

- (a) Second difference = 4 $\rightarrow$ coefficient of n^2 is 2.
Subtract $2n^2$ (2, 8, 18, 32) from terms (5, 14, 27, 44) $\rightarrow$ remainder is 3, 6, 9, 12 (linear term $3n$).
Expression: $2n^2 + 3n$
- (b) $2n^2 + 3n = 434 \rightarrow (2n + 3)(n - 14) = 0 \rightarrow n = 14$.
Since $n = 14$ is a positive integer, 434 is the 14th term.

Challenge 2:

- (a) Second difference = 4 $\rightarrow$ coefficient of n^2 is 2.
Subtract $2n^2$ (2, 8, 18, 32) from terms (-1, 4, 13, 26) $\rightarrow$ remainder is -3, -4, -5, -6 (linear term $-n - 2$).
Expression: $2n^2 - n - 2$
- (b) Set $2n^2 - n - 2 = 500 \rightarrow 2n^2 - n - 502 = 0$.

Using the quadratic formula, n does not result in an integer value (discriminant = $1 - 4(2)(-502) = 4017$, and $\sqrt{4017}$ is not an integer). Therefore, 500 is not a term.