Maths Homework :02

Year: 9

Student Name: _____ Date: 08/10/2020

1 Write whether each sequence is arithmetic or quadratic.

a 1, 4, 7, 10, 13, ...

b 1, 4, 9, 16, 25, ...

c 13, 8, 3, –2, –7, ...

An **arithmetic** sequence goes up or down in equal steps.

An nth term that incluces n^2 (and no higher power of n) generates a quadratic sequence.

2 Work out the first four terms and the 10th term of the quadratic sequence with

a $T(n) = n^2$

First four terms: 1, ...

$T(1) = 1^2 = 1$
$T(2) = 2^2 = \square$

10th term: .....

b $T(n) = 2n^2$

$T(n)$ is another way of writing the nth term.

c $T(n) = -3n^2$

d $T(n) = 5n^2$

3 Reasoning Find the 5th and 10th terms of the sequence $T(n) = 2n^2 + 3$
Explain why the 10th term is not double the 5th term.

4 Find the nth term of the sequence 4, 7, 12, 19, ...

Term number	1	2	3	4
Term	4	7	12	19
Difference		3	5	7
2nd difference			2	2

When the difference isn't constant, you can work out the difference between the differences. This is known as the **second difference.**

Work out the differences between the terms.

Work out the second difference. Any sequence that has a second difference of 2 is based around n^2.

Term number	1	2	3	4
Term	4	7	12	19
		+3	+3	+3
n^2	1	4	9	16

Write the sequence of square numbers (n^2). 3 is added to each of the square numbers.

nth term is $T(n) = n^2 + ...$

Describe the sequence.

If the second difference is 4, the sequence is based around $2n^2$.
If the second difference is 6, the sequence is based around $\square$.

5 Find the nth term of each sequence.

a 8, 11, 16, 23, ...

b 3, 9, 19, 33, ...

c –2, 7, 22, 43, ...