Sequences (H & F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name: ANSWERS BY
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1. Find the nth term of the sequence 6, 13, 20, 27, ...

\[ 7n - 1 \]  

[2]

2. The nth term of a sequence is \(2n + 1\)

The nth term of a different sequence is \(3n - 1\)

- Work out the three numbers that are in both sequences and between 20 and 40

\[ 2n+1 : 21, 23, 25, 27, 29, 31, 33, 35, 37, 39 \]
\[ 3n-1 : 20, 23, 26, 29, 32, 35, 38 \]

[3]

3. Which sequence is a geometric progression?

Circle your answer.

\[ \boxed{1 \ 2 \ 3 \ 4} \]
\[ \boxed{1 \ 2 \ 4 \ 7} \]
\[ 1 \ 2 \ 3 \ 5 \]

[1]

4. Here are the first four terms of an arithmetic sequence.

\[ 6 \ 10 \ 14 \ 18 \]

(a) Write an expression, in terms of \(n\), for the nth term of this sequence.

\[ 4n + 2 \]

[2]
The $n$th term of a different arithmetic sequence is $3n + 5$

(b) Is 108 a term of this sequence? $3n + 5 = 108$

Show how you get your answer. 

$3n = 103$

$n = 34\frac{1}{3}$

as $n$ is not an integer, 108 is not in the sequence

5. Here are the first six terms of a Fibonacci sequence.

$1 \ 1 \ 2 \ 3 \ 5 \ 8 \ 13 \ 21$

The rule to continue a Fibonacci sequence is, the next term in the sequence is the sum of the two previous terms.

(a) Find the 9th term of this sequence.

$13 + 21$

$34$

(b) Show that the 6th term of this sequence is $3a + 5b$

$a + 2b + 2a + 3b = 3a + 5b$

Given that the 3rd term is 7 and the 6th term is 29,

(c) find the value of $a$ and the value of $b$.

\begin{align*}
3a + 5b &= 29 \quad (2) \\
3a + 3b &= 21 \quad (0 \times 3)
\end{align*}

\begin{align*}
2b &= 8 \\
b &= 4 \\
a + b &= 7 \\
a + 4 &= 7
\end{align*}

6. Work out the next term of this quadratic sequence.

\begin{align*}
4 &\quad 12 &\quad 24 &\quad 40 &\quad 60 \\
8 &\quad 12 &\quad 16 &\quad 20
\end{align*}