FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

A23: Generating sequences

Generate terms using term-to-term and position-to-term rules

20 marks · 25 minutes · Non-calculator

1) The first term of a sequence is 5. The rule to get the next term is "multiply by 2, then subtract 3". Write down the next three terms.

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[Question 1: 2 marks]

2) The nth term of a sequence is $3n^2 - 2$

(a) Write down the first three terms.

.....

(2)

(b) Find the 10th term.

.....

(1)

[Question 2: 3 marks]

3) The nth term of a sequence is $\frac{n+1}{2n}$. Find the 3rd term as a fraction in simplest form.

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[Question 3: 1 marks]

4) A sequence is given by $u_{n+1} = 2u_n - 1$ with $u_1 = 3$. Find u_4.

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[Question 4: 2 marks]

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5) The nth term of a sequence is $4n + 2$. Is 150 a term of this sequence? Show how you decide.

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[Question 5: 2 marks]

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6) The nth term of a sequence is $5 - 2n$. Write down the first four terms.

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[Question 6: 2 marks]

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7) The first term of a sequence is 2. The rule is "square the term, then subtract 1". Write down the next three terms.

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[Question 7: 2 marks]

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8) The nth term of a sequence is $n^2 + 3n$.

(a) Find the 6th term.

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(1)

(b) Is 70 a term of the sequence? Show how you decide.

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(2)

[Question 8: 3 marks]

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9) $u_{n+1} = u_n^2 - 2$ and $u_1 = 3$. Find u_3.

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[Question 9: 2 marks]

10) The nth term of a sequence is $2^n + 1$. Find the 5th term.

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[Question 10: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	7, 11, 19	B2 (B1 for two correct).
2	(a) 1, 10, 25 (b) 298	(a) B2 (B1 for two correct). (b) B1.
3	$\frac{2}{3}$	B1.
4	17	$u_2 = 5$, $u_3 = 9$ (M1); A1.
5	Yes, the 37th term	$4n + 2 = 150$ (M1); $n = 37$, a whole number, so yes (A1).
6	$3, 1, -1, -3$	B2 (B1 for 2 or 3 correct).
7	3, 8, 63	B2 (B1 for 2 correct).
8	(a) 54 (b) Yes, $n = 7$	(a) B1. (b) $n^2 + 3n = 70$ or trial of $n = 7$ (M1); $7^2 + 21 = 70$, yes (A1).
9	47	$u_2 = 7$ (M1); A1.
10	33	B1.