JP Maths Revision

SEQUENCES

FOUNDATION / HIGHER TIER

Attempt the paper before watching the solutions!

https://www.youtube.com/@JPMathsRevision

Name: _____ Date: _____

1. The first four terms of a linear sequence are:
5, 8, 11, 14…

(a) Write down the next three terms. 17, 20, 23 (1)

(b) Write down the term-to-term rule. Add 3 (1)

2. The first four terms of a linear sequence are:
40, 35, 30, 25…

(a) Write down the next three terms. 20, 15, 10 (1)

(b) Explain why 13 is **not** a term in this sequence. The terms go down in 5s (difference is 5). 13 is not 5 less than any term. (1)

3. The first four terms of a sequence are:
2, 6, 18, 54…

(a) Write down the next three terms. 162, 486, 1458 (1)

(b) Write down the term-to-term rule. Multiply by 3 (1)

4. The first four terms of a sequence are:
1, 1, 2, 3…

(a) Write down the next two terms. 5, 8 (1)

(b) What is the name of this type of sequence? Fibonacci sequence (1)

5. A Fibonacci sequence begins with the terms 7 and 11.
Write down the next three terms. 18, 29, 47 (1)

12. Find the nth term of the sequence: 100, 95, 90, 85… $105 - 5n$ (2)

13. Find the nth term of the sequence: 0.4, 0.8, 1.2, 1.6… $0.4n$ (2)

14. The nth term of a sequence is $5n + 3$

(a) Find the 10th term. 53 (1)

(b) Is 40 a term in this sequence? Yes. When $n = 7$, $5 \times 7 + 3 = 38$. (2)

15. The nth term of a sequence is $-2 + 8n$

(a) Find the 25th term. 198 (1)

(b) Is 22 a term in this sequence? No. Solving $-2 + 8n = 22$ gives $n = 3$. 3 is not a whole number. (2)

16. The nth term of a sequence is $3n + 7$
Is 100 a term in this sequence?
No. Solving $3n + 7 = 100$ gives $n = 31 \rightarrow 3(31) + 7 = 100$. This would be the 31st term, not the 100th. (2)

6. Here is a sequence of patterns made with counters.

Pattern 1 Pattern 2 Pattern 3 Pattern 4

(a) Find an expression, in terms of n, for the number of counters in pattern number n.
$\frac{n(n+1)}{2}$ (2)

(b) How many counters would be needed to make pattern number 20?
210 (2)

7. Find the nth term of the sequence: 4, 7, 10, 13… $3n + 1$ (2)

8. Find the nth term of the sequence: 12, 17, 22, 27… $5n + 7$ (2)

9. Find the nth term of the sequence: 20, 16, 12, 8… $24 - 4n$ (2)

10. Find the nth term of the sequence: 3.5, 5.5, 7.5, 9.5… $2n + 1.5$ (2)

11. Find the nth term of the sequence: −2, 1, 4, 7… $3n - 5$ (2)

17. The nth term of a sequence is $6n + 5$
Work out the difference between the 4th term and the 5th term. 6 (1)

18. The nth term of a sequence is $5n + 2$
Sophie says that 42 is a term in this sequence.
Is Sophie correct? You must explain your answer.
No. Solving $5n + 2 = 42$ gives $n = 8$. 8 is the position of the term, not the value 42. (2)

19. The first term of a sequence is 10.
The term-to-term rule is +8.
Is 74 a term in this sequence?
You must explain your answer.
Yes. $10 + 8(n - 1) = 74 \rightarrow 8(n - 1) = 64 \rightarrow n - 1 = 8 \rightarrow n = 9$.
74 is the 9th term. (2)

20. The first two terms of a Fibonacci sequence are a, 4
The 6th term is 29.
Find the value of a.
$a = -1$ (3)