

Algebra 1 · Arithmetic and Geometric Sequences · Quiz

Common Core F-IF.A.3, F-BF.A.2, F-LE.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check your skill with sequences: telling arithmetic from geometric, finding terms, writing explicit and recursive formulas, and using sequences to model growth. Choose the one correct answer, then read the explanation to learn from any mistake.

Algebra 1 Common Core: **F-IF.A.3 · F-BF.A.2 · F-LE.A.2**

Questions

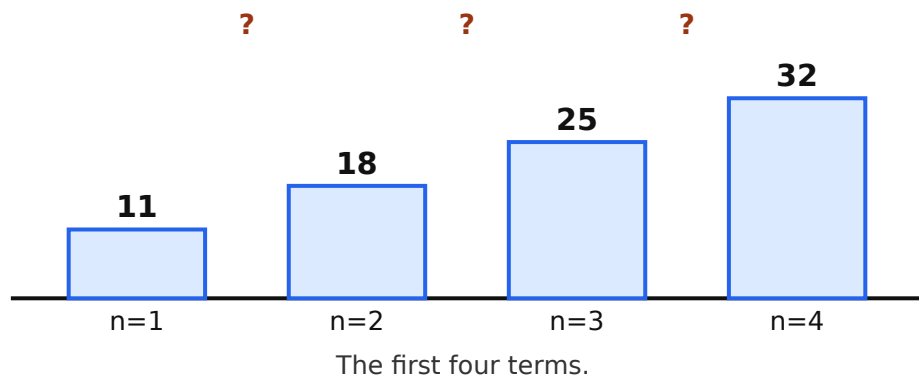
Question 1

What is the next term of the sequence 5,15,45,135?

- A. 405
- B. 180
- C. 270
- D. 675

Question 2

What is the common difference of the sequence shown?



- A. 8
- B. 11
- C. 3
- D. 7

Question 3

Which explicit formula describes 4,9,14,19?

- A. $a_n = 4 + 5n$
- B. $a_n = 4 + 5(n-1)$
- C. $a_n = 5 + 4(n-1)$
- D. $a_n = 4 \cdot 5^{n-1}$

Question 4

For $a_n = 3 \cdot 2^{n-1}$, what is a_6 ?

- A. 96
- B. 192
- C. 36
- D. 18

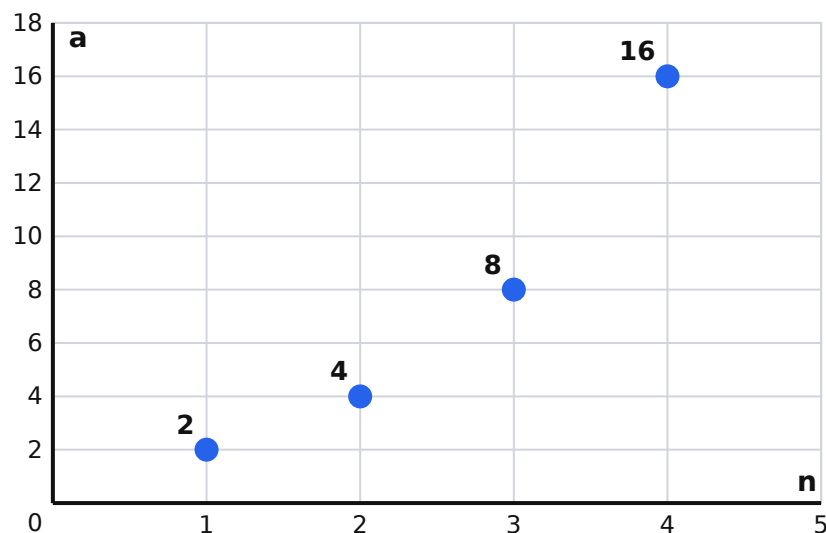
Question 5

Which recursive formula describes 7,3,-1,-5?

- A. $a_1 = 7, a_n = a_{n-1} - 4$
- B. $a_1 = 7, a_n = a_{n-1} + 4$
- C. $a_1 = 7, a_n = -4 \cdot a_{n-1}$
- D. $a_1 = -4, a_n = a_{n-1} + 7$

Question 6

Which statement describes the sequence graphed below?



Four terms of a sequence.

- A. Arithmetic with $d = 2$
- B. Arithmetic with $d = 4$

- C. Geometric with $r = 2$
- D. Geometric with $r = 4$

Question 7

An arithmetic sequence has $a_3 = 10$ and $a_7 = 34$. What is the common difference?

- A. 8
- B. 6
- C. 4.8
- D. 24

Question 8

In the arithmetic sequence 2, 5, 8, 11, which term equals 71?

- A. The 23rd term
- B. The 25th term
- C. The 69th term
- D. The 24th term

Question 9

A savings account grows 4% each year, as shown.

Year	1	2	3
Value	0.00	0.00	0.80

Account value at the start of years 1 to 3.

What is the value in year 4?

- A. 0.80
- B. 0.00
- C. 4.32
- D. 2.43

Question 10

A sequence has $a_1 = 2$ and $a_n = 2 \cdot a_{n-1} + 1$. What is a_4 ?

- A. 16
- B. 11
- C. 23
- D. 47

Answer key

1. **A** - Each term is multiplied by 3, so the next term is $135 \cdot 3 = 405$. Adding 45 again (giving 180) treats it as arithmetic.
2. **D** - Subtract consecutive terms: $18 - 11 = 7$, $25 - 18 = 7$, $32 - 25 = 7$. The first term, 11, is not the difference.
3. **B** - The first term is 4 and the common difference is 5, so $a_n = 4 + 5(n-1)$. Without the $n-1$, the first term would be 9.
4. **A** - $a_6 = 3 \cdot 2^5 = 3 \cdot 32 = 96$. Using the exponent 6 gives 192, and multiplying $3 \cdot 2 \cdot 6$ gives 36.
5. **A** - The terms drop by 4 each time, so subtract 4 from the previous term, starting at 7. The formula $-4 \cdot a_{n-1}$ would give 7, -28, 112.
6. **C** - The terms are 2, 4, 8, 16. The differences (2, 4, 8) change, but every ratio is 2. The points curve upward instead of lying on a line.
7. **B** - There are 4 steps from term 3 to term 7, so $d = \frac{34-10}{4} = 6$. Dividing 24 by 5 or 3 miscounts the steps, and 24 is the total change.
8. **D** - $2 + 3(n-1) = 71$ gives $3(n-1) = 69$, so $n-1 = 23$ and $n = 24$. Stopping at $n-1 = 23$ is a common slip.
9. **D** - The growth is multiplicative: $540.80 \cdot 1.04 = 562.432$, which rounds to 2.43. Adding each year would give 0.80, which treats it as arithmetic.
10. **C** - Apply the rule step by step: $a_2 = 5$, $a_3 = 11$, $a_4 = 23$. Forgetting the +1 gives 16, and stopping early gives 11.

Remember:

- Standards F-IF.A.3, F-BF.A.2 and F-LE.A.2: sequences as functions, explicit and recursive formulas, and modeling with arithmetic and geometric sequences.
- Arithmetic: $a_n = a_1 + (n-1)d$; recursive $a_n = a_{n-1} + d$.
- Geometric: $a_n = a_1 \cdot r^{n-1}$; recursive $a_n = r \cdot a_{n-1}$.
- Arithmetic sequences grow linearly; geometric sequences grow or decay exponentially.
- To identify the type, test consecutive differences first, then consecutive ratios.