

Precalculus - Sequences and Series - Quiz

Common Core F-IF.A.3, F-BF.A.2, A-SSE.B.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Pick the best answer for 10 questions on sequences and series. Explanations name common errors, such as using n instead of n minus 1 in the exponent.

Precalculus · Common Core State Standards: **F-IF.A.3, F-BF.A.2, A-SSE.B.4**

Questions

Question 1

What is the common difference of 12,9,6,3?

- A. 3
- B. $\frac{1}{2}$
- C. -4
- D. -3

Question 2

What is a_{10} for $a_n = 2 \cdot 3^{n-1}$?

- A. 54
- B. 59,049
- C. 39,366
- D. 20

Question 3

Which is the explicit formula for 5,9,13,17?

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

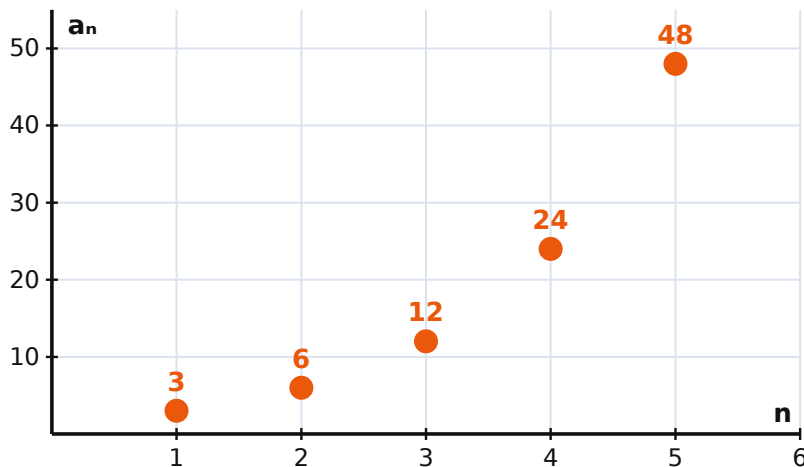
Question 4

An arithmetic sequence has a first term of 9 and common difference -2. What is its 12th term?

- A. -15
- B. 13
- C. -24
- D. -13

Question 5

The graph shows a geometric sequence. What is the common ratio?



Plotted terms.

- A. 2
- B. 3
- C. 4
- D. $\frac{1}{2}$

Question 6

What is the sum of the first 10 positive integers?

- A. 50
- B. 55
- C. 45
- D. 100

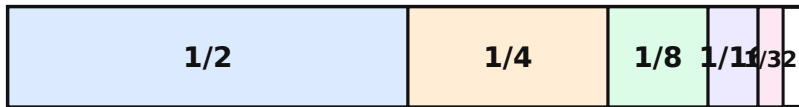
Question 7

Which infinite series has a sum?

- A. $1 + \frac{1}{2} + \frac{1}{4} + \dots$
- B. $1 + 2 + 4 + \dots$
- C. $1 + 1 + 1 + \dots$
- D. $3 + 4.5 + 6.75 + \dots$

Question 8

Find $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$



$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ gets closer and closer to 1

A bar of length 1.

- A. 2
- B. 1
- C. $\frac{1}{2}$
- D. It has no sum

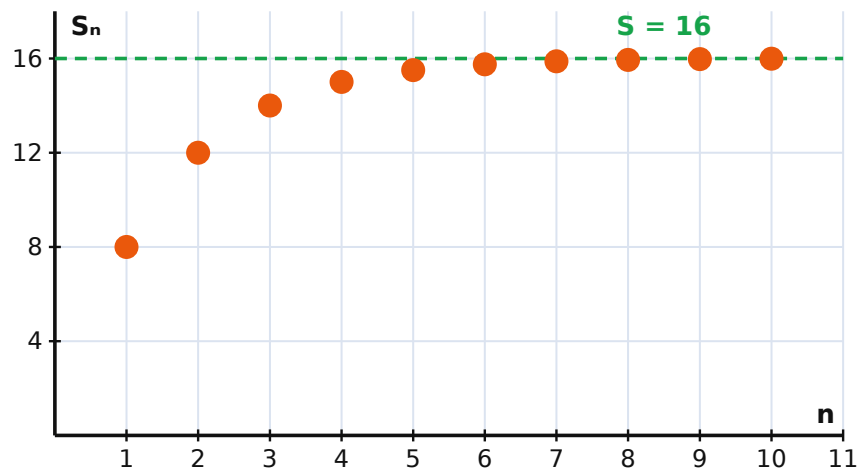
Question 9

Which statement is true about $a_n = a_{n-1} \cdot 2$ with $a_1 = 3$?

- A. It is arithmetic with difference 2
- B. It is geometric with ratio 2
- C. It is geometric with ratio 3
- D. It is not a sequence

Question 10

Find the sum of $8+4+2+1+ \dots$ shown in the graph of partial sums.



Partial sums.

- A. 15
- B. 8
- C. 16
- D. 32

Answers

1. **D** - Each term is 3 less than the previous term, so $d = -3$.
2. **C** - $a_{10} = 2 \text{ times } 3^9 = 2 \text{ times } 19,683 = 39,366$. Using 3^{10} gives the next term.
3. **A** - $d = 4$ and $a_1 = 5$, so $a_n = 5 + 4(n - 1) = 4n + 1$.
4. **D** - $a_{12} = 9 + 11(-2) = -13$. Using 12 instead of $n - 1 = 11$ gives -15.
5. **A** - Each term is twice the previous term: $6/3 = 12/6 = 2$.
6. **B** - $S = 10/2 (1 + 10) = 55$.
7. **A** - Only a series with $|r| < 1$ converges; here $r = 1/2$.
8. **B** - $a_1 = 1/2$ and $r = 1/2$, so $S = (1/2)/(1/2) = 1$, as the bar shows.
9. **B** - Multiplying the previous term by 2 each time makes it geometric with $r = 2$.
10. **C** - $S = 8/(1 - 1/2) = 16$. The partial sums approach 16.

Remember

- Arithmetic: $a_n = a_1 + (n - 1)d$; $\text{sum } S_n = (n/2)(a_1 + a_n)$.
- Geometric: $a_n = a_1 r^{(n-1)}$; $\text{sum } S_n = a_1(1 - r^n)/(1 - r)$.
- Sigma notation adds the terms from the lower index to the upper index.
- An infinite geometric series converges only if $|r| < 1$, and then $S = a_1/(1 - r)$.
- A recursive formula gives each term from the one before it.