

Algebra 2 · Sequences and Series · Quiz

Common Core A-SSE.B.4, F-BF.A.2, F-IF.A.3 · mathovore.fr

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

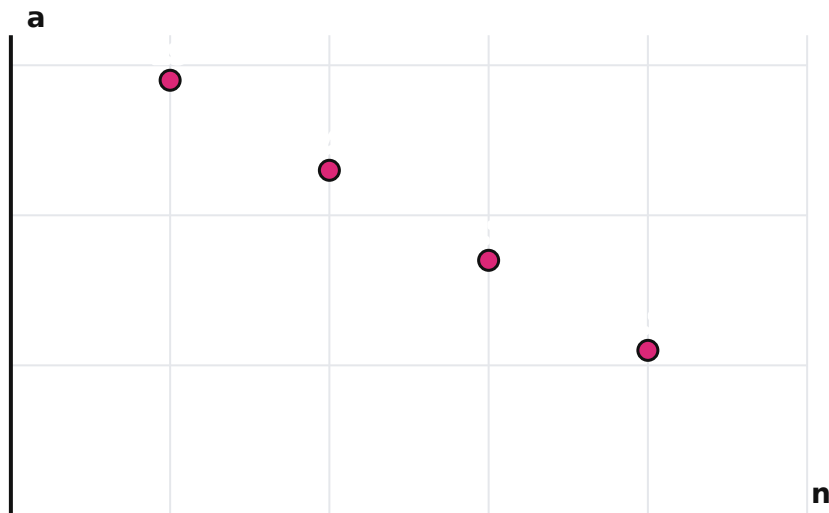
Ten multiple-choice questions check explicit and recursive formulas, sigma notation, series sums and money applications. Pick the single best answer; the explanation after each question shows the common mistake.

Algebra 2 Common Core: A-SSE.B.4 · F-BF.A.2 · F-IF.A.3

Questions

Question 1

What is the common difference of the sequence graphed below?



Points (n, a_n) .

- A. -6
- B. 6
- C. -5
- D. -12

Question 2

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

- A. 192

- B. 36
- C. 48
- D. 96

Question 3

Which recursive formula generates 5, 15, 45, 135?

- A. $a_1 = 5, a_n = a_{n-1} + 10$
- B. $a_1 = 3, a_n = 5a_{n-1}$
- C. $a_1 = 5, a_n = 3a_{n-1}$
- D. $a_1 = 5, a_n = a_{n-1} + 3$

Question 4

What is the value of $\sum_{k=1}^4 (5k-1)$?

- A. 50
- B. 46
- C. 36
- D. 62

Question 5

Find the sum of the arithmetic series $3+7+11$ that continues with common difference 4 until its last term, 43.

- A. 506
- B. 230
- C. 276
- D. 253

Question 6

What is the sum of the first 6 terms of the geometric series $2+6+18+54$ that continues with ratio 3?

- A. 728
- B. 1458
- C. 1456
- D. 364

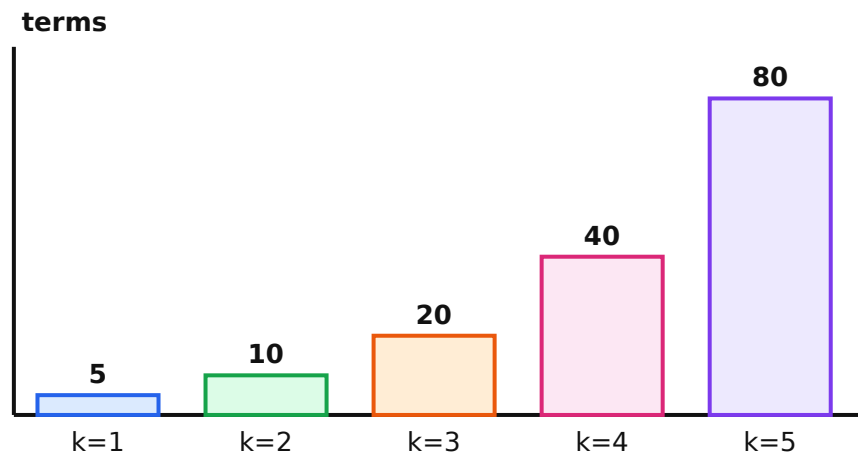
Question 7

An arithmetic sequence begins 4, 10, 16 and ends with 154. How many terms does it have?

- A. 25
- B. 27
- C. 26
- D. 24

Question 8

Which sigma expression gives the terms shown in the chart?



Five terms of a series.

- A. $\sum_{k=1}^5 5 \cdot 2^k$
- B. $\sum_{k=1}^5 5 \cdot 2^{k-1}$
- C. $\sum_{k=1}^5 5^k$
- D. $\sum_{k=1}^4 5 \cdot 2^{k-1}$

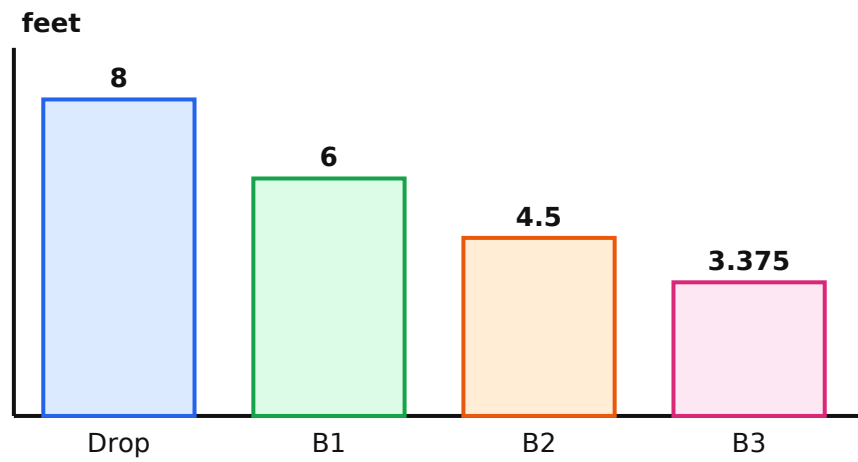
Question 9

Ethan saves in week 1 and more each week than the week before. How much has he saved in total after 10 weeks?

- A. \$1,400
- B. \$900
- C. \$1,000
- D. \$950

Question 10

A ball is dropped from 8 feet and rebounds to three-fourths of its previous height on each bounce. How high is the third bounce?



The drop and first three bounces.

- A. 4.5 ft
- B. 3.375 ft
- C. 6 ft
- D. 2.53 ft

Answer key

1. **A** - Each step down is 6, so $d = -6$. Using 6 ignores the direction of the change.
2. **D** - Substitute $n = 6$: $3 \cdot 2^5 = 96$. Using 2^6 gives 192, a common exponent error.
3. **C** - The ratio is $\frac{15}{5} = 3$, so each term is 3 times the previous. Adding 10 only fits the first two terms.
4. **B** - Terms: 4, 9, 14, 19, which add to 46. Dropping the -1 from each term gives 50.
5. **D** - There are 11 terms, so $S = \frac{11(3+43)}{2} = 253$. Forgetting to divide by 2 gives 506.
6. **A** - $S_6 = \frac{2(3^6-1)}{3-1} = 728$. Forgetting to divide by $r-1$ gives 1456.
7. **C** - $4+6(n-1)=154$ gives $n-1=25$, so $n=26$. Answering 25 forgets to add the first term back.
8. **B** - The terms start at 5 and double, so $5 \cdot 2^{k-1}$ for $k=1$ to 5. Using 2^k would start at 10.
9. **D** - Week 10 is \$140, so $S_{10} = \frac{10(50+140)}{2} = 950$. Multiplying 10 by 140 counts every week at the largest amount.
10. **B** - $8\left(\frac{3}{4}\right)^3 = 3.375$ feet. The value 4.5 is only the second bounce.

Remember:

- Arithmetic: explicit $a_n = a_1 + (n-1)d$, recursive $a_n = a_{n-1} + d$.
- Geometric: explicit $a_n = a_1 r^{n-1}$, recursive $a_n = r \cdot a_{n-1}$.
- Arithmetic series: $S_n = \frac{n(a_1 + a_n)}{2}$.
- Geometric series: $S_n = \frac{a_1(1-r^n)}{1-r}$ for $r \neq 1$.
- Sigma notation $\sum_{k=1}^n$ is shorthand for adding terms from $k=1$ to $k=n$.