

Geometric Sequences Quiz Questions and Answers PDF

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Which of the following sequences is a geometric sequence?

- 2, 4, 8, 16 ✓
- 1, 3, 6, 10
- 5, 10, 15, 20
- 7, 14, 21, 28

A geometric sequence is defined as a sequence where each term after the first is found by multiplying the previous term by a constant called the common ratio. To identify a geometric sequence, check if the ratio between consecutive terms is constant.

Which formula represents the n-th term of a geometric sequence?

- $a_n = a_1 + (n-1)d$
- $a_n = a_1 \times r^{(n-1)}$ ✓
- $a_n = a_1 \times n$
- $a_n = a_1 + r$

The n-th term of a geometric sequence can be calculated using the formula $a_n = a_1 \times r^{(n-1)}$, where a_1 is the first term, r is the common ratio, and n is the term number.

If the first term of a geometric sequence is 5 and the common ratio is 2, what is the third term?

- 10
- 15
- 20 ✓
- 25

In a geometric sequence, each term is found by multiplying the previous term by the common ratio. For this sequence, the third term can be calculated as 5 (first term) multiplied by 2 (common ratio) squared, resulting in 20.

Describe a real-world scenario where a geometric sequence might be used.

Geometric sequences can be used in calculating compound interest in finance, where the interest is applied to the principal repeatedly over time.

Calculate the fifth term of a geometric sequence where the first term is 3 and the common ratio is 4.

The fifth term is $3 \times 4^4 = 192$.

How does the common ratio affect the behavior of a geometric sequence? Provide examples.

If the common ratio is greater than 1, the sequence increases. If it's between 0 and 1, the sequence decreases. If it's negative, the sequence alternates in sign.

If the sum of the first three terms of a geometric sequence is 21 and the common ratio is 2, what is the first term?

Let the first term be a . Then, $a + 2a + 4a = 21$. Solving gives $a = 3$.

Discuss the conditions under which an infinite geometric series converges and provide an example.

An infinite geometric series converges if the absolute value of the common ratio is less than 1. For example, the series $1, 0.5, 0.25, \dots$ converges to 2.

What is the sum of the first three terms of the geometric sequence 2, 6, 18?

- 24
- 26
- 28
- 30 ✓

The sum of the first three terms of the geometric sequence 2, 6, 18 is calculated by adding the terms together: $2 + 6 + 18 = 26$.

In a geometric sequence, if the first term is 8 and the common ratio is -2, what is the second term?

- 8
- 16
- 16 ✓
- 4

In a geometric sequence, each term is found by multiplying the previous term by the common ratio. Therefore, the second term can be calculated by multiplying the first term (8) by the common ratio (-2).

If a geometric sequence has a common ratio of 0.5, what type of sequence is it?

- Increasing
- Decreasing ✓**
- Constant
- Alternating

A geometric sequence with a common ratio of 0.5 is a decreasing sequence, as each term is half of the previous term. This means the terms will approach zero but never actually reach it.

Which of the following sequences are geometric?

- 1, 2, 4, 8 ✓**
- 3, 6, 12, 24 ✓**
- 5, 10, 15, 20
- 7, 14, 28, 56 ✓**

A geometric sequence is defined as a sequence where each term after the first is found by multiplying the previous term by a fixed, non-zero number called the common ratio. To determine if a sequence is geometric, check if the ratio between consecutive terms is constant.

What is the common ratio of the sequence 100, 50, 25, 12.5?

- 0.25
- 0.5 ✓**
- 2
- 4

The common ratio of the sequence is 0.5, as each term is obtained by multiplying the previous term by 0.5.

In a geometric sequence, which of the following can be true if the common ratio is negative?

- The sequence is increasing.
- The sequence is decreasing. ✓**
- The sequence terms alternate in sign. ✓**
- The sequence is constant.

In a geometric sequence with a negative common ratio, the terms will alternate in sign, meaning some terms will be positive and others negative. This can lead to sequences that oscillate between positive and negative values, depending on the initial term.

Explain how you would determine if a given sequence is geometric.

A sequence is geometric if the ratio of any term to its preceding term is constant.

What are possible values for the common ratio in a geometric sequence?

- Greater than 1 ✓
- Less than 1 ✓
- Equal to 1 ✓
- Negative ✓

In a geometric sequence, the common ratio can be any non-zero real number, including positive numbers, negative numbers, fractions, and irrational numbers. The only restriction is that it cannot be zero, as this would invalidate the sequence.

What is the common ratio in the geometric sequence 3, 9, 27, 81?

- 2
- 3 ✓
- 4
- 5

The common ratio in a geometric sequence is found by dividing any term by the previous term. In this sequence, the common ratio is 3, as each term is obtained by multiplying the previous term by 3.

Which of the following are applications of geometric sequences?

- Calculating compound interest ✓
- Linear regression analysis

- Population growth models ✓
- Arithmetic progression

Geometric sequences are commonly used in various applications such as calculating compound interest, modeling population growth, and analyzing exponential decay in physics. They are essential in fields like finance, biology, and engineering.

Which statements are true about the sum of an infinite geometric series?

- It converges if the common ratio is greater than 1.
- It converges if the common ratio is less than 1. ✓
- It diverges if the common ratio is equal to 1. ✓
- It converges if the absolute value of the common ratio is less than 1. ✓

The sum of an infinite geometric series converges if the absolute value of the common ratio is less than one, and it can be calculated using the formula $S = a / (1 - r)$, where 'a' is the first term and 'r' is the common ratio.

Which of the following are properties of a geometric sequence?

- Each term is obtained by adding a constant to the previous term.
- Each term is obtained by multiplying the previous term by a constant. ✓
- The ratio between consecutive terms is constant. ✓
- The difference between consecutive terms is constant.

A geometric sequence is characterized by a constant ratio between consecutive terms, meaning each term is obtained by multiplying the previous term by a fixed, non-zero number called the common ratio.