Sequences and Series Quiz PDF

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What is the common difference in the arithmetic sequence 3, 7, 11, 15, ...?

- ◯ 2
- ◯ 4
- ◯ 5
- ◯ 3

Which of the following is a geometric sequence?

- ◯ 2, 4, 6, 8, ...
- ◯ 5, 10, 15, 20, ...
- ◯ 1, 3, 5, 7, ...
- ◯ 3, 6, 12, 24, ...

Explain the difference between a sequence and a series.

Which sequences are considered divergent?

- ☐ $\sum_{n=1}^{\infty} \frac{1}{n}$
- ☐ $\sum_{n=1}^{\infty} \frac{1}{n^2}$
- ☐ $\sum_{n=1}^{\infty} n$
- ☐ $\sum_{n=1}^{\infty} \frac{1}{2^n}$

Describe how you would determine if an infinite series converges or diverges.

Which sequence is defined by the recursive formula a_n = a_{n-1} + a_{n-2} with initial terms 0 and 1?

- ◯ Arithmetic Sequence
- ◯ Harmonic Sequence
- ◯ Fibonacci Sequence
- ◯ Geometric Sequence

Which series is divergent?

- ◯ \(\sum_{n=1}^{\infty} \frac{1}{n^2} \)
- ◯ \(\sum_{n=1}^{\infty} \frac{1}{2^n} \)
- ◯ \(\sum_{n=1}^{\infty} \frac{1}{n^3} \)
- ◯ \(\sum_{n=1}^{\infty} \frac{1}{n} \)

What is the formula for the nth term of an arithmetic sequence?

- ◯ a_n = a_1 * r^(n-1)
- ◯ a_n = a_1 * n
- ◯ a_n = a_1 + n
- ◯ a_n = a_1 + (n-1) * d

What is the sum of the infinite geometric series with first term 5 and common ratio 0.5?

- ◯ 10
- ◯ 20
- ◯ 25
- ◯ 15

Which of the following are properties of an arithmetic sequence?

- ☐ Constant difference between terms
- ☐ Linear growth

- [ ] Constant ratio between terms
- [ ] Exponential growth

What is the sum of the first 5 terms of the arithmetic sequence 2, 5, 8, 11, ...?

- ◯ 25
- ◯ 35
- ◯ 40
- ◯ 30

Which of the following are characteristics of a geometric sequence?

- [ ] The ratio between consecutive terms is constant
- [ ] It can be finite or infinite
- [ ] The difference between consecutive terms is constant
- [ ] It always converges

Provide an example of a real-world application of geometric sequences.

Explain the significance of the Fibonacci sequence in nature.

How does the concept of convergence apply to infinite series in mathematics?

Describe a scenario where an arithmetic sequence might be used in everyday life.

Which tests can be used to determine the convergence of a series?

- [ ] Ratio Test
- [ ] Root Test
- [ ] Difference Test
- [ ] Integral Test

Which of the following statements about infinite series are true?

- [ ] All infinite series converge
- [ ] An infinite geometric series converges if the common ratio is less than 1
- [ ] An infinite arithmetic series always diverges
- [ ] The sum of an infinite series can be finite

Which of the following are examples of special series?

- [ ] Arithmetic Series
- [ ] Harmonic Series
- [ ] Telescoping Series
- [ ] Exponential Series

In a geometric sequence, if the first term is 2 and the common ratio is 3, what is the fourth term?

- ◯ 18
- ◯ 54
- ◯ 81
- ◯ 24