

# 41 Lecture - MTH101

## Important Mcqs

Which of the following is a recursive formula for the Fibonacci sequence?

- a)  $f_n = n^2$
- b)  $f_1 = 1, f_2 = 1, f_n = f_{n-1} + f_{n-2}$
- c)  $f_n = n!$
- d)  $f_n = 2^n$

Answer: b)  $f_1 = 1, f_2 = 1, f_n = f_{n-1} + f_{n-2}$

What is the  $n$ th term of the arithmetic sequence 2, 5, 8, 11, ...?

- a)  $2n + 1$
- b)  $3n + 1$
- c)  $3n - 1$
- d)  $2n + 2$

Answer: d)  $2n + 2$

Which of the following tests is used to determine whether an infinite series converges or diverges?

- a) Comparison test
- b) Limit comparison test
- c) Integral test
- d) All of the above

Answer: d) All of the above

What is the sum of the geometric series  $1/2 + 1/4 + 1/8 + \dots + (1/2)^n + \dots$ ?

- a) 1
- b) 2

c)  $3/2$

d)  $4/3$

**Answer: c)  $3/2$**

**Which of the following is a bounded sequence?**

a)  $\{n^2\}$

b)  $\{(-1)^n\}$

c)  $\{1/n\}$

d)  $\{n/(n+1)\}$

**Answer: d)  $\{n/(n+1)\}$**

**Which of the following is an example of an arithmetic sequence?**

a) 1, 3, 9, 27, ...

b) 1, 2, 4, 8, ...

c) 2, 4, 8, 16, ...

d) 1,  $1/2$ ,  $1/4$ ,  $1/8$ , ...

**Answer: b) 1, 2, 4, 8, ...**

**What is the  $n$ th term of the geometric sequence 1, 2, 4, 8, ...?**

a)  $2^n$

b)  $2n$

c)  $n^2$

d)  $n!$

**Answer: a)  $2^n$**

**Which of the following is an example of a divergent series?**

a)  $1/2 + 1/4 + 1/8 + \dots + (1/2)^n + \dots$

b)  $1 + 1/2 + 1/3 + \dots + 1/n + \dots$

c)  $1 - 1/2 + 1/3 - \dots + (-1)^n/n + \dots$

d)  $e^x = 1 + x + x^2/2! + x^3/3! + \dots$

Answer: c)  $1 - 1/2 + 1/3 - \dots + (-1)^n/n + \dots$

**What is the limit of the sequence  $\{1/n\}$  as  $n$  approaches infinity?**

a) 0

b) 1

c) -1

d) Does not exist

Answer: a) 0

**Which of the following is a formula for the  $n$ th term of a geometric sequence?**

a)  $a_n = a_1 + (n-1)d$

b)  $a_n = a_1 * r^{(n-1)}$

c)  $a_n = n^2$

d)  $a_n = a_1 + r^n$

Answer: b)  $a_n = a$