# 45 Lecture - MTH101

# **Important Subjective**

#### What is a Taylor series?

**Answer:** A Taylor series is an infinite series representation of a function as a sum of its derivatives evaluated at a specific point.

#### What is a Maclaurin series?

Answer: A Maclaurin series is a special case of the Taylor series where the point of expansion is zero.

#### What is the formula for a Taylor series?

**Answer:** The formula for a Taylor series is:  $f(x) = f(a) + f'(a)(x-a) + f''(a)(x-a)^2/2! + f'''(a)(x-a)^3/3! + ...$ 

#### What is the formula for a Maclaurin series?

Answer: The formula for a Maclaurin series is:  $f(x) = f(0) + f'(0)x + f''(0)x^2/2! + f'''(0)x^3/3! + ...$ 

#### What is the nth term in a Taylor series?

**Answer:** The nth term in a Taylor series is:  $f^{(n)(a)(x-a)^n/n!}$ , where  $f^{(n)(a)}$  is the nth derivative of f evaluated at a.

#### What is the nth term in a Maclaurin series?

**Answer:** The nth term in a Maclaurin series is:  $f^{(n)(0)x^n/n!}$ , where  $f^{(n)(0)}$  is the nth derivative of f evaluated at zero.

#### What is the Lagrange form of the remainder term in a Taylor series?

**Answer:** The Lagrange form of the remainder term in a Taylor series is:  $Rn(x) = f^{(n+1)}(c)(x-a)^{(n+1)/(n+1)!}$ , where c is a value between a and x.

#### What is the Lagrange form of the remainder term in a Maclaurin series?

**Answer:** The Lagrange form of the remainder term in a Maclaurin series is:  $Rn(x) = f^{(n+1)}(c)x^{(n+1)/(n+1)!}$ , where c is a value between 0 and x.

## What is the Taylor series expansion of e^x?

Answer: The Taylor series expansion of  $e^x$  is:  $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$ 

## What is the Maclaurin series expansion of sin x?

Answer: The Maclaurin series expansion of sin x is:  $\sin x = x - x^3/3! + x^5/5! - x^7/7! + ...$