Taylor Series

A Taylor series is an expansion of a function into an infinite sum of terms, where each term’s exponent is larger and larger. It allows us to approximate a function using a polynomial.

Taylor Series Representation:

The Taylor series centered at "a" for f(x) looks like this:

$$f(x) = f(a) + f'(a)(x-a)/1! + f''(a)(x-a)^2/2! + f'''(a)(x-a)^3/3! + ...$$

Applications:

Taylor series have numerous applications in various areas of mathematics, science, and engineering. Here are a few examples:

- Approximating complex functions with simpler polynomials for calculations.
- Studying the behavior of functions near specific points.
- Deriving infinite series representations for important functions like sine, cosine, and exponential functions (e^x).