MATH 147 Review: Taylor Series and Radius of Convergence

Facts to Know

The Taylor Series of a function $f(x)$ centered at $a$

$$f(x) = \sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!} (x - a)^n$$

Examples

1. Find the Taylor Series of the function $f(x) = e^x$ centered at 0.

2. Find the Taylor Series of the function $f(x) = \ln(x)$ centered at 1.
3. Find the Taylor Series of the function \( f(x) = \frac{1}{1-x} \) centered at 0.

4. Find the Taylor Series of the function \( f(x) = \frac{1}{(1-x)^2} \) centered at 0.