

MAC2312
MORE suggested problems on Chapter 9 material
(infinite series)

Idris Mercer

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1. Find the degree 2 Taylor polynomial for $f(x) = e^{-x}$ centered at $x_0 = 0$.
2. Find the degree 2 Taylor polynomial for $f(x) = \sqrt{x}$ centered at $x_0 = 1$, and use that to estimate $\sqrt{1.1}$.
3. Find the MacLaurin series for the function $f(x) = e^{-x}$. Write your answer in sigma notation.
4. Find the MacLaurin series for the function $f(x) = x \sin x$. Write your answer in sigma notation.
5. Find the MacLaurin series for the function $f(x) = \ln(1 + x)$. Write your answer in sigma notation.
6. Find the MacLaurin series for the function $f(x) = \sqrt{1 + x}$. Write your answer in sigma notation.
7. Find the Taylor series centered at $x_0 = 1$ for the function $f(x) = e^x$. Write your answer in sigma notation.
8. Find the interval of convergence of the power series, and find a familiar function that is represented by the power series on that interval.

$$1 - x + x^2 - x^3 + \cdots + (-1)^k x^k + \cdots$$

9. Find the radius of convergence and the interval of convergence.

$$\sum_{k=0}^{\infty} \frac{x^k}{k+1}$$

10. Find the radius of convergence and the interval of convergence.

$$\sum_{k=0}^{\infty} \frac{(-1)^k x^k}{k!}$$