

Math 272
Infinite Series Part II

Find the radius of convergence for the power series.

1. $f(x) = \sum_{n=1}^{\infty} (2x)^2/(n)$

Find the interval of convergence for the power series.

2. $f(x) = \sum_{n=1}^{\infty} (x - 2)^n/(n(3^n))$

Find a power series for $f'(x)$.

3. $f(x) = \sum_{n=1}^{\infty} (3x^n)/(n!)$

Find a power series and interval of convergence for $f'(x)$ and $\int f(x) dx$.

4. $f(x) = 1/(1+x) = \sum_{n=1}^{\infty} (-1)^n(x^n)$ converges on the interval $-1 < x < 1$

Find a power series centered at $x = 0$.

5. $f(x) = 1/(x + 8)$

Find the power series for $f(x)$ using $e^x = \sum_{n=1}^{\infty} (x^n)/(n!) = 1 + x + x^2/2! + x^3/3! + \dots$

6. $f(x) = e^{-0.5x^2}$

7. Find the Maclaurin series for $f(x) = \sin 2x$.

8. Given the power series $\sin x = x - x^3/3! + x^5/5! - x^7/7! + \dots$

a. Find the power series for $\cos x$.

b. Use the result to part a to find a series for $\cos \sqrt{x}$.