

Due on February 27, 2006, Monday, Class time. No late submissions!

MATH 114 Homework 3

1: Find the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{n^2 \sin(1/n)}{3n-1} x^n$.

Do not forget to check the end points.

2: Find the interval of convergence of the power series $f(x) = \sum_{n=1}^{\infty} n^2 x^n$.

Do not forget to check the end points. Show that $f(x)$ is a rational function of x .

3: Find the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{n!}{n^n} x^n$.

Do not forget to check the end points.

4: Find the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{n!}{2^n} x^n$.

Do not forget to check the end points.

5: Assume that $f(x) = \sum_{n=0}^{\infty} c_n x^n$ converges for all $x \in (-c, c)$ for some $c > 0$. Show that when f is an odd function, then $c_{2n} = 0$ for all n . Also show that when f is even, then $c_{2n+1} = 0$ for all n .