136.271 Assignment 3

Due Friday, March 13, 2004, in class

1. Which of the following series converges absolutely, which converges conditionally and which diverges? Justify your answers.

(a) $\displaystyle\sum_{n=1}^{\infty}\frac{(-1)^{n+1}(0.1)^n}{n}$

(b) $\displaystyle\sum_{n=2}^{\infty}\frac{(-2)^{n+1}}{n+5^n}$

(c) $\displaystyle\sum_{n=1}^{\infty}(-1)^{n+1}\sqrt[n]{10}$

(d) $\displaystyle\sum_{n=2}^{\infty}(-1)^n\left(\frac{\ln n}{\ln(n^2)}\right)^n$

2. Find the interval of convergence for the following power series.

(a) $\displaystyle\sum_{n=0}^{\infty}\frac{(x-2)^n}{10^n}$

(b) $\displaystyle\sum_{n=0}^{\infty}\frac{(2x+3)^{2n+1}}{n!}$

(c) $\displaystyle\sum_{n=1}^{\infty}(n)^n x^n$

For the series $\displaystyle\sum_{n=0}^{\infty}\frac{(x-2)^n}{10^n}$ (in part **a** above), fund the sum of the series as a function on x.

3. Find the power series representation of the function $g(x)=\dfrac{x^2}{(1+2x)^2}$ and the interval of convergence of the power series.