Practice for 11.5 – 11.6 ***Name:***

1. Determine whether the series is convergent or divergent.

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

b) $\sum_{n=1}^{\infty} (-1)^n \left(1 - \frac{1}{n}\right)^n$

c) $\sum_{n=2}^{\infty} \frac{(-1)^{n+1} n}{\ln n}$

d) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n\sqrt{n}}$

e) $\sum_{n=1}^{\infty} (-1)^n \frac{\sqrt{n}}{1+2\sqrt{n}}$

f) $\sum_{n=1}^{\infty} \frac{\sin(n\pi/2)}{n!}$

g) $\sum_{n=1}^{\infty}\left(\sqrt{n}-\sqrt{n-1}\right)^n$

h) $\sum_{n=0}^{\infty}\frac{n^{n/2}}{n!}$

2. Test for (a) absolute convergence, (b) conditional convergence.

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

b) $\sum_{n=1}^{\infty}\frac{\sin(n\pi/4)}{n^2}$

3. How many terms of the series do we need to add in order to find the sum to the indicated accuracy?

a) $\sum_{n=1}^{\infty}\frac{(-1)^n}{n^4}$ $|error| < 0.001$

b) $\sum_{n=1}^{\infty}\frac{(-1)^n n}{4^n}$ $|error| < 0.0002$

4 Find a power series for the function, centered at c, and determine the interval of convergence.

a) $f(x)=\dfrac{1}{3-x};\ c=5$

b) $f(x)=\dfrac{1}{2x-3};\ c=0$

c) $f(x)=\dfrac{4x-7}{2x^2+3x-2};\ c=0$

d) $f(x)=\dfrac{4}{3x+2};\ c=2$

5. Find the series representation of the function and determine its interval of convergence.

a) $f(x)=\dfrac{x}{(1-x)^2}$

b) $f(x)=\dfrac{1+x}{(1-x)^2}$

6. Find the Maclaurin series for the following functions:

a) $f(x)=e^{x^2/3}$

b) $f(x)=x^3\sin(5x)$