Math 253 GWS 5 - 8.4 Other Convergence Tests Name:_____

1. Test the series for convergence or divergence.

   a. $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\ln(n+4)}$

   b. $\sum_{n=1}^{\infty} (-1)^n \frac{n}{\sqrt{n^3+2}}$

2. Given the series $\sum_{n=1}^{\infty} (-1)^{n-1} n e^{-n}$, show that the series is convergent then find the sum with $|\text{error}| < 0.001$.

3. Given the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{n!}$, show that the series is convergent then find the sum with $|\text{error}| < 0.0005$.

4. Determine whether the following series are absolutely convergent or not.

a. $\sum_{n=1}^{\infty} \frac{n!}{100^n}$

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

c. $\sum_{n=1}^{\infty} \frac{(-1)^n 3n}{4n-1}$

d. $\sum_{n=1}^{\infty} \frac{n}{2^n}$

e. $\sum_{n=1}^{\infty} \frac{\sin(4n)}{4^n}$

g. $\sum_{n=1}^{\infty} \frac{1}{n^3}$

f. $\frac{2}{5} + \frac{2 \cdot 6}{5 \cdot 8} + \frac{2 \cdot 6 \cdot 10}{5 \cdot 8 \cdot 11} + \frac{2 \cdot 6 \cdot 10 \cdot 14}{5 \cdot 8 \cdot 11 \cdot 14} + ...$

h. $\sum_{n=1}^{\infty} \frac{(-3)^{n-1}}{\sqrt{n}}$