Fall 2005 Math 152

courtesy: Amy Austin
(covering sections 10.3,10.4)

Section 10.3

1. Determine whether the following series converge or diverge. Clearly state what test you applied, and apply it completely and correctly.

   a.) $\sum_{n=2}^{\infty} \frac{1}{n(\ln n)}$

   b.) $\sum_{n=1}^{\infty} \frac{\arctan n}{n^2+1}$

   c.) $\sum_{n=2}^{\infty} \frac{1}{n^2+4}$

   d.) $\sum_{n=5}^{\infty} \frac{1}{n-\sqrt{n}}$

   e.) $\sum_{n=2}^{\infty} \frac{1}{n^5-5n}$

   f.) $\sum_{n=1}^{\infty} \frac{2^n}{n+e^n}$

   g.) $\sum_{n=1}^{\infty} \frac{\ln n}{\sqrt{n^5}}$

2. Use the 10th partial sum to estimate the sum of the series $\sum_{n=1}^{\infty} \frac{1}{n^4}$. How accurate is this estimate?

Section 10.4

3. Determine whether the following series converge or diverge. If it converges, does it converge absolutely?

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

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

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

   d.) $\sum_{n=1}^{\infty} \frac{(n+1)3^{2n}}{n4^n}$

   e.) $\sum_{n=1}^{\infty} \frac{3^n n^2}{(2n)!}$

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

4. Show $\sum_{n=0}^{\infty} \frac{(-3)^n}{(2n+1)!}$ converges absolutely and then approximate with the third partial sum. How close is this approximation to the sum of the series?

5. Approximate $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2}$ with error less than .01.