

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.