Homework 10 - Math 141, Frank Thorne (thornef@mailbox.sc.edu)

Due Friday, November 8

(a) Explain what sigma notation means and how to use it.

(b) What is a geometric series? When does it converge, and if so, to what?

(c) Derive the formula for the sum of a geometric series.

(d) 11.2, 11-14, 21-24, 35-36, 47, 58, 64, 65.

(e) What is the integral test? Explain why it works.

(f) 11.3, 11-20. In addition:

- For each series which diverges, if you use the integral test, then draw a graph which represents both the series and the integral you're comparing it to.

- For each series which converges, give upper and lower bounds on the value of your series which are guaranteed to be accurate within 0.01. Draw a graph which represents your lower bound.

- Note that answers such as

$$1 + \frac{1}{2\sqrt{2}} + \frac{1}{3\sqrt{3}} + \cdots + \frac{1}{99\sqrt{99}} + \frac{1}{20} < \sum_{n=1}^{\infty} a(n),$$

$$1 + \frac{1}{2\sqrt{2}} + \frac{1}{3\sqrt{3}} + \cdots + \frac{1}{99\sqrt{99}} + \frac{1}{100\sqrt{100}} + \frac{1}{20} > \sum_{n=1}^{\infty} a(n)$$

are acceptable and expected. It will often be impractical to simplify the expressions you get. (But if you get something easy, then please simplify it.)

Additional problems: 11.2, 25-32, 11.3, 23-26 (Same instructions as above).

Bonus: Do 11.3, 22 subject to the instructions above. What is unusual about this computation?