*Due:* **Tuesday** *4 November 2012 at the beginning of class. You will not have any skills problems due that day.*

Your solution should be written out carefully and will be graded according to the rubric on the course page. Because you are not under the time pressure of a writing quiz, your work should be especially well organized; in particular you should write out at least one draft of your solution before you write your final draft to hand in. Although you can rewrite your solution after it is graded, both drafts will count towards your grade.

You can (and should) work with others on your solution, but your final solution must be your own, written in your own words. If your solution is taken from an online or printed resource you will receive a zero on both your initial draft and rewrite.

Write a proof of the ratio test as stated in class:

**Theorem (Ratio Test).** *Let $\sum a_n$ be a series of nonzero terms.*

- *If $\lim \left| \dfrac{a_{n+1}}{a_n} \right| < 1$, then $\sum a_n$ converges absolutely.*
- *If $\lim \left| \dfrac{a_{n+1}}{a_n} \right| > 1$, then $\sum a_n$ diverges*

As stated in your book, the Ratio Test involves $\lim \sup$ and $\lim \inf$, which are defined in a section that we didn't cover. Hence the book's version (Theorem 33.7) and its proof contain terms and reasoning which don't apply for our course. However, the proofs that you find in other books (or on Wikipedia) are not detailed enough for our course. You are welcome to read those proofs, but when you write your final draft you should write it in your own words, without referring to another book, student, or other resources.