Quiz #6

M1220-1 Fall 2003

Name:_____ Score: _____

QUESTIONS: each question is worth 20 points. Give your answer and a short but complete motivation of it for full credit.

1. State the ratio test for the convergence of series.

2. Give me an example of:
   (a) an absolutely convergent series;
   (b) a conditionally convergent series;
   (c) a diverging alternating series.

3. TRUE or FALSE: let $\{a_n\}$ be a NON NEGATIVE sequence.

   (a) if $\lim_{n\to+\infty} a_n = 0$ then the alternating series $\sum(-)^n a_n$ converges;

   (b) if $\lim_{n\to+\infty} a_n = 0$ and the sequence is eventually monotonic, then the alternating series $\sum(-)^n a_n$ converges;

4. Give me an example of:

   (a) a power series converging for all x;

   (b) a power series converging only for $x = 0$;

   (c) a power series converging on a finite interval.

PROBLEM: the problem is worth 20 points. Show me enough work to let me know what you are doing!

1. Determine the radius of convergence of the following power series. What function does this series converge to?

$$\sum_{0}^{\infty}(-)^n x^n$$

HINT: let $\diamond = (-x)$ and then think of the geometric series.