Math 4410 Advanced Calculus II

Today: Series theorems
Next time: Analytic functions

HW 4
Due Friday, January 20, 2006, by 5pm.

1. How does Theorem 8.18ii relate to the Root Test?
2. Suppose a power series has radius of convergence R>0.
   a. Does the derivative of the sum equal the sum of the derivatives? Does the radius of convergence stay the same?
   b. Does the integral of the sum equal the sum of the integrals? Does the radius of convergence stay the same?

   If the answers are yes, give a theorem to support your answer. Otherwise, give a counterexample.
3. Create two of your own series based on the geometric series using substitution, differentiation, and/or integration. Give the interval of convergence. Be sure to check the endpoints.
4. Define the following: C^∞
5. Is it possible for the interval of convergence of a power series to be infinite?
6. Do 8.3 #1,3,6.
7. You may do 8.3 #9 for up to 3 points extra credit. However, do all of the regular assignment first.