MATH 2250, Fall 2010.
Homework assignment, Sept. 17, 2010

Will be collected Monday, Sept. 20.

I included some problems from the previous assignments, you will need to write them neatly, if you did not do that before.

1. p. 123, #2
2. Construct a sequence $a_n \in \mathbb{C}$, $|a_n| < 1$,

$$\sum_{n=1}^{\infty}(1 - |a_n|) < \infty$$

and such that any point of the unit circle $\mathbb{T} := \{z \in \mathbb{C} : |z| = 1\}$ is an accumulation point of the sequence $\{a_n\}_{n=0}^{\infty}$

3. p. 123 #5 (was in the previous assignment)
4. p. 120, # 3 (was in one of the previous assignments)
5. (Was in one of the previous assignments) Assuming that the series,

$$f(z) := \sum_{n=1}^{\infty} a_n z^n, \qquad g(z) := \sum_{n=0}^{\infty} b_n z^n$$

converge for all $|z| < R$, show that

$$f(z)g(z) = \sum_{n=0}^{\infty} \left(\sum_{k=0}^{n} a_k b_{n-k} \right) z^n$$

where the series converge for all $|z| < R$.