

Math 113 Problem Set 9

Due Monday, November 17, 2003

1. Bak and Newman, problem 14.7.
2. Bak and Newman, problem 14.8.
3. (a) Bak and Newman, problem 10.10. (Rouché's Theorem is stated on page 123 of Bak and Newman.)
(b) Use Rouché's Theorem to give an alternate proof of Hurwitz's Theorem 10.13, which we proved in class: if $f_n : R \rightarrow \mathbb{C}$ converges uniformly on compact subsets to $f(z)$, and $f(z_0) = 0$ but f is not constant (so f has an isolated zero at z_0), then for sufficiently large n there exists a z_n so that $f_n(z_n) = 0$.