MA/CS 321:001 MWF 11:00-11:50 FB 213 Fall 2004 Instructor: Russell Brown Office: POT741 Phone: 257-3951 russell.brown@uky.edu

Homework 3. This should be a fairly easy assignment. It will be due on Monday 20, September. We will have one more assignment on Newton's method before the exam. I hope to hand this assignment out on Friday, 17 September 2004.

- 1. Section 2.3, #5. You are to compute $\frac{1}{2}(e^x e^{-x})$ to (Marc-32) machine precision for |x| < 1/2. Read example 3, page 79 to see how Taylor series might be helpful. You will need to use the remainder formula in Taylor's theorem in order to estimate how many terms of the series are needed.
- 2. Section 2.3 #19. Please do this without using Taylor series.
- 3. Let $[a_n, b_n]$ be the interval after n steps of the bisection method. If we let n tend to infinity, we have $\lim_{n\to\infty} a_n$ and $\lim_{n\to\infty} b_n$ exist and are equal. Set $\alpha = \lim_{n\to\infty} a_n$. (You do not need to prove this.)

Find a (discontinuous) function f and an interval [a, b] where the bisection method converges to α , but α is not a root of f.

4. Section 3.1 # 22.