Homework 1 18.086 Spring 2006

for MONDAY 2/13/06

This homework is optional—if you hand it in, that will be recorded (and a missed homework later will be treated generously) Thank you for patience with the videotaping process!

MATLAB 1   Draw decent figures of the (complex) Runge-Kutta stability regions

$$|1 + z + z^2/2| \leq 1 \qquad \text{AND} \qquad |1 + z + z^2/2 + z^3/6 + z^4/24| \leq 1 \,.$$

MATLAB 2   Solve $u' = -10\,u$ by at least two of the second order methods. Stop at $t = 1$, and check the accuracy (do the numbers support $(\Delta t)^2$?). How serious is the stability test on $-10\,\Delta t$??