Math 370: Numerical Analysis

Group Activity **ONE** MATLAB and Nonlinear Systems of Equations
Spring 2009 *Prof. R. Buckmire*

Group Members: **SCORE: /10**

INSTRUCTIONS: In small groups of two or three use MATLAB to solve the given problem. Write down what steps the group took to solve the problem. Only one sheet per group.
GOAL: To demonstrate your familiarity with MATLAB and ability to use the given software to solve a specific problem, in this case a nonlinear system of equations.

Consider the hyperbola $4x^2 - y^2 = 1$ and the circle $(x-1)^2 + y^2 = 4$.
(a) Modify the `demonewtonsys.m` program and use an initial guess of $(1, 2)^T$ to find a point of intersection of the two curves. How many points of intersection do the two curves have? Can you find them all numerically? Can you find them algebraically? Do you need to graph the curves? How would you do so?

(b) Use the file `hypcirc.m` with `seidel` and `succsub` to again find the solutions to the nonlinear system to within 5 decimal places. Which method (of the three)do you prefer and why?