AMSC/CMSC 460   Quiz 7   ,   Fall 2007

Show all work. You may leave arithmetic expressions in any form that a calculator could evaluate. By putting your name on this paper, you agree to abide by the university's code of academic integrity in completing the quiz. Use no books, calculators, cellphones, communication with others, scratchpaper, etc.

Name _____

1. (10) Write Matlab code to use `fzero` to find an approximate solution to the problem

$$F(x) = \int_0^x g(t)dt = 5.$$

You may assume that there is a Matlab function `g.m` that evaluates $g(t)$, that $F(1) < 5$ and that $F(2) > 5$. Recall that `fzero` finds a point x so that $f(x) = 0$. It takes two arguments: the first defines the function f and the second is a vector of length 2 where f evaluated at the first component differs in sign from f evaluated at the second.

2. (10) Apply one step of Newton's method to solve the nonlinear equation

$$\begin{bmatrix} x_1^2 + x_2^2 - 1 \\ \cos(x_2) \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

using a starting guess of $x_1 = 1/2$, $x_2 = \pi/4$. Your answer should be either two numbers (the values of x_1 and x_2 after the iteration), or computable formulas that Matlab could use to get these numbers.
(Recall that $\cos(\pi/4) = \sin(\pi/4) = \sqrt{2}/2$.)