2/17/2003 MA423 Numerical Analysis Name:_____
Dr. Lunsford Quiz 4 (20 Points Total)

Use the equation $x - .8 - .2\sin(x) = 0$ to answer the following. Please write all approximations to the accuracy of your calculator display.

I. Explain why the equation has a solution on the interval $\left[0, \frac{\pi}{2}\right]$. (3 points)

II. Complete three iterations of the Bisection method with starting interval $\left[0, \frac{\pi}{2}\right]$ to find an approximation of a solution to the equation. Neatly show all of your work. Note: You may want to organize your work in a table. (6 points)

III. If you stop at iteration three of the bisection method, what is your approximation to a solution of the equation and what is the maximum possible absolute error for this approximation? (2 points)

IV. What is the minimum number of iterations of the bisection method required to approximate a solution of the equation that will have a maximum possible absolute error of $10^{-5}$? Assume the same starting interval as above. (3 points)

V. Now use Newton's Method to approximate a solution of the equation with $p_0 = \frac{\pi}{4}$. Only find $p_1$, $p_2$, and $p_3$. Clearly indicate your answers and neatly show all of your work. (6 points)