2/17/2006	MATH405 Numerical Analysis	Name:
Dr. Lunsford	Quiz 3	(20 Points Total)

1. Use the equation $x - 0.8 - 0.2 \sin(x) = 0$ to answer the following questions. Please write all approximations to the accuracy of your calculator display. (12 points total)

(a) Complete three iterations of the Bisection method with starting interval $\left| 0, \frac{\pi}{2} \right|$ to find

an approximate solution of the equation. Neatly show all of your work. Note: You may want to organize your work in a table. (7 points)

(b) If you stop at iteration three of the bisection method, what is your approximate solution of the equation and what is the *maximum possible* absolute error for this approximation (do not compute the actual error)? (2 points)

(c) What is the minimum number of iterations of the bisection method required to guarantee the approximate solution of the equation will have an absolute error of no more than 10^{-5} ? Assume the same starting interval as above. (3 points)

II. Use $p = \frac{(12116 - 11923)}{.32756}$ to answer the following questions. (8 points total)

(a) Compute an approximation to p, say \hat{p} , using <u>four digit rounding arithmetic</u>. (4 points)

(b) Complete the error chart below using your approximation, \hat{p} , found in part (a) and

your calculator approximation of p as the exact	Absolute Error of	
value of p . (2 points)	Approximation	
	Relative Error of	
	Approximation	

(c) To how many significant digits does \hat{p} approximate p? (2 points)