10/10/2009	MATH405 Numerical Analysis	Name:
Dr. Lunsford	Quiz 1	(30 Points Total)
1. Use a classic theore	m of calculus to explain why the equati	on $x - 0.8 - 0.2\sin(x) = 0$
has a solution on the in	iterval $\left[0, \frac{\pi}{2}\right]$. NOTE: DO NOT attem	ppt to find the solution! (5
points)		

II. Use p = (13227 - 12832) * 12345 to answer the following questions. (10 points total) (a) Compute an approximation to p, say p, using <u>four digit rounding arithmetic</u>. (4 points)

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

your calculator approximation of p as the exact value of p. (3 points)

Absolute Error of	
Approximation	
Relative Error of	
Approximation	

(c) To how many significant digits does p approximate p? (3 points)

II. Find the 4th degree Taylor polynomial, $P_4(x)$, centered at $\frac{\pi}{2}$ for the function $\cos x$. DO NOT simplify your answer. (6 points)

III. Use $P_4(x)$ found above to approximate $\cos(100^\circ)$. (4 points)

IV. Use the Taylor remainder, $R_4(x)$, to find an upper bound for the absolute error of the approximation of $\cos(100^\circ)$ using $P_4(x)$. <u>Compare</u> this to the actual absolute error (use your calculator approximation of $\cos(100^\circ)$ as its actual value). (5 points)