University of Central Florida
Department of Electrical Engineering and Computer Science
COT 4500 Numerical Calculus
Assignment 2 (Spring 2013)

Due on February 18^{th} in class.
For all exercises show all your work step by step.

1.- Using the Bisection method, find the largest root of $f(x) - x^6 - x - 1 = 0$, accurate to within $\epsilon = 0.001$. Assume $a = 1$, $b = 2$, and $f(a) = -1$, $f(b) = 61$. Compute the numbers of iteration required and for each iteration, present a table showing: n, a, b, c, $b - c$, and $f(c)$. (20 points)

2.- Apply Newton's method to solve the same problem of question one (1), $f(x) - x^6 - x - 1 = 0$. Present a table showing: n, a, x_n, $f(x_n)$, $x_n - x_{n-1}$, and $r - x_{n-1}$., for $n = 0, 1, 2, 3, 4, 5$,and 6. (20 points)

3.- Use the Secant method to solve the same problem of question one(1), $f(x) - x^6 - x - 1 = 0$, and present a table showing: n, x_n, $f(x_n)$, $x_n - x_{n-1}$, and $r - x_{n-1}$, for $n = 0, 1, , 2, 3, 4, 5, 6, 7$,and8. (20 points).

4.- Write an algorithm, using pseudocode or C-like notation, to implement the Secant method.(20 points)

5.- Show that when Newtons method is applied to the equation $x^2 - a = 0$, the resulting iteration function is $g(x) = \frac{1}{2}(x + \frac{a}{x})$. (20 points)