

Math 4364 (Fall 2009) Ch2:
due on September 30, 2008.

Problem 1. Solve

$$x - \cos x = 0$$

by the following methods with 10^{-5} as the tolerance. There are codes available on the Burden and Faires' web page for the following methods.

- (a) Use the bisection method on the interval $[0, 1]$.
- (b) Use the fixed point iteration with $g(x) = \cos x$ and $P_0 = 0.5$.
- (c) Use the Newton's method with $P_0 = 0.5$ and 1000. How does the sequence $\{P_n\}$ behave for the case of $P_0 = 1000$?
- (d) Use the Secant method with $P_0 = 0$ and $P_1 = 1$.
- (e) Use the Steffensen's method with $g(x) = \cos x$ and $P_0 = 0.5$.

Does the number of iterations decrease when the order of method increase?