

HOME WORK II

DUE : FEB/1/2006

Theoretical Part :

- (1) Show that the iteration equation for the Secant method can be written in the following form:

$$p_n = \frac{f(p_{n-1})p_{n-2} - f(p_{n-2})p_{n-1}}{f(p_{n-1}) - f(p_{n-2})}.$$

- (2) Let $f(x) = -x^3 - \cos(x)$ and $p_0 = -1$. With $p_0 = -1$ and $p_1 = 0$. Find p_3 using the Secant method.

Computational Part :

- (1) The function $f(x) = \tan(\pi x) - 6$ has a zero at $1/\pi \arctan(6) \approx 0.447431543$. Let $p_0 = 0.4$ and $p_1 = 0.48$ and use ten iterations of each of the following methods to approximate this root. Which method is most successful?
- Bisection method with initial interval $[0, 1]$
 - Secant method
 - Newton's method with $p_0 = 0.4$.