MAT 362 Spring 2007 quiz 2 Name:

Instructor: Nándor Sieben
e-mail: nandor.sieben@nau.edu
http://jan.ucc.nau.edu/∼ns46/362/362.html
Office: AMB 175
Hours: MW 10:10-12:10, F 10:10-11:10

---

1. Use three iterations of the secant method to get an approximation for the root of $f(x) = (x+1)(x-3)$. Let the initial guesses be $p_0 = 0$ and $p_1 = 1$.

Solution: We have $p_n = p_{n-1} - \frac{f(p_{n-1})(p_{n-1}-p_{n-2})}{f(p_{n-1})-f(p_{n-2})}$. So
$p_2 = 1 - \frac{f(1)(1-0)}{f(1)-f(0)} = 1 - \frac{-4}{-4-(-3)} = 1 - \frac{-4}{-1} = -3$,
$p_3 = \cdots = 0$,
$p_4 = \cdots = -0.6$.
So the root of f is approximately -0.6.

2. Use one iteration of Newton's method to get an approximation for the root of $f(x) = (x+1)(x-3)$. Use the initial guess $p_0 = 0$.

Solution: $p_1 = p_0 - \frac{f(p_0)}{f'(p_0)} = 0 - \frac{-3}{-2} = -\frac{3}{2}$.