Homework 4: Root Finding
Due: March 16, 2012

1. Find conditions on the constant α to ensure that the iteration

$$x_{n+1} = x_n - \alpha f(x_n)$$

   will converge linearly to a zero of f if started near the zero.

2. Moler 4.1

3. Moler 4.2

4. (Based on Moler 4.8) Investigate the behavior of the secant method on the function

$$f(x) = \text{sign}(x-a)\sqrt{|x-a|}.$$

   What happens if you apply the Newton's method on this function?