MATH 160 Homework 20 Name: _____
Due 10/29 MATH 160 section _____

1. Why does Newton's method fail at a point x_n where $f'(x_n) = 0$?
2. Use Newton's method to find the two real solutions to $x^4 - 2x^3 - x^2 + 2$.
3. The functions $\tan(x)$ and $2x$ intersect over the interval $[0, \pi/2]$. Use Newton's method to find where.
4. Use Newton's method to estimate $3^{1/7}$ to at least 4 decimal places of accuracy. Explain how you know your approximation is accurate up to 4 decimal places.
5. In submarine location problems, it is often necessary to find a submarine's closest point of approach to a sonobuoy (sound detector) in the water. Suppose that a submarine is traveling along the parabolic path $y = x^2$ and that the buoy is located at the point $(2, -1/2)$.
   a. Show that the value of x that minimizes the distance between the submarine and the buoy is a solution of the equation $x = 1/(x^2 + 1)$.
   b. Solve the equation in part (a) using Newton's method.