Math 10A
Worksheet, Discussion #12; Tuesday, 7/3/2018
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1 Newton's Method

1.1 Concepts

1. Newton's method helps us approximate the zeros of a function $f(x)$. It is a recursive process in that we start with some guess $x = x_0$, then use Newton's method to give us a better guess x_1, and we can do this over and over again to get better and better guesses. The equation is
$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}.$$

1.2 Problems

2. Use Newton's method with two steps to estimate $\sqrt{5}$.
3. Use Newton's method to estimate $\sqrt[4]{16.32}$.
4. Find the critical points of $g(x) = \sin(x) - x^2$
5. Use Newton's method to estimate $\sqrt[3]{28}$.
6. Find the critical points of $e^x + x^2$.
7. Find when $\cos x = x$.
8. Find the roots of $f(x) = x^3 - x + 1$.
9. Use Newton's method to estimate $2^{0.1}$.