Name:

Math 10a
October 2, 2014
Quiz #4

1. Let $f(x) = \sin(x)$. What is the second order Taylor polynomial for f centered at $x = \frac{\pi}{2}$?

2. Let $f(x) = \ln(x)$. What is the third order Taylor polynomial for f centered at $x = 1$?

3. Estimate $\ln(1.1)$ using its third order Taylor polynomial centered at $x = 1$.

4. In summation notation, write down the nth order Taylor polynomial to e^x centered at $x = 0$.

5. (a) The equation $x^3 + 2x + 2 = 0$ has only one real solution. Why?

(b) It looks to me like the solution should be pretty close to -1, since $(-1)^3 - 2 + 2 = -1$ isn't terribly big. Improve on this estimate with *two* iterations of Newton's method. Express your answer as a fraction in simplest terms.

6. Compute the infinite sum

$$1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \cdots .$$