## Homework Handout for Class 27, Due with Homework 10

**Name:**

For the following five functions, find both $P_1(x)$ and $P_2(x)$ around $x = a$. Then use these polynomials to approximate $f(x^*)$. Finally graph the Taylor polynomials as well as the function. Write at least one sentence comparing the two different Taylor approximations to $f(x^*)$.

**1.** $f(x) = \ln x; a = 2; x^* = 1$

**2.** $f(x) = e^x; a = 0; x^* = 1$

**3.** $f(x) = \cos x; a = \dfrac{\pi}{2}; x^* = \dfrac{\pi}{3}$

**4.** $f(x) = \sin x; a = \dfrac{\pi}{2}; x^* = \dfrac{\pi}{3}$

**5.** $f(x) = \sqrt{1 + x^2}; a = \sqrt{3}; x^* = 1$