Math 128
Worksheet 3 – November 5, 2008

Name ______________________

1. (a) For $f(x) = \cos x$, calculate the 4th Taylor polynomial $T_4(x)$ centered at 0.

   (b) Verify from the definition that the Taylor series for $\cos x$ centered at 0 is $T(x) = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2k)!} x^{2k}$.

2. Find an upper bound for the error of the $n$th Taylor polynomial for $\cos x$ centered at 0 on the interval $[-1, 1]$. Conclude that the Taylor polynomial converges to $\cos x$ on this interval.

3. (a) Find a Taylor series for $f(x) = x \sin x^2$.

   (b) Using your answer from part (a), find a Taylor series for $\frac{d^2}{dx^2} x \sin x^2$.

I also highly recommend doing some (most) of the suggested problems from sections 11.4 and 11.5!!