Math 128
Worksheet 2 – October 30, 2008

Name _____

1. Find $T_{100}(x)$, the 100th Taylor polynomial centered at 0 for $f(x) = x^3 + 3x - 1$.

2. (a) For what x does $\sum_{k=0}^{\infty} e^{-kx}$ converge?

   (b) Use the geometric series formula to simplify the series.

3. Let $f(x) = e^{x^2}$. Find $f^{(7)}(0)$ and $f^{(8)}(0)$. You may use the fact that the 10th Taylor polynomial centered at 0 for e^{x^2} is:

$$T_{10}(x) = 1 + x^2 + \frac{1}{2}x^4 + \frac{1}{6}x^6 + \frac{1}{24}x^8 + \frac{1}{120}x^{10}.$$

4. Let $f(x) = e^x$. Find a value of n so that the Taylor polynomial $T_n(x)$ is accurate to 0.1 on the interval $[-1, 1]$. (That is, the error of T_n as an approximation to e^x is less than 0.1.)