

Mth 351 Assignment 1

Summer
2005

Name:

Bent Petersen 351u2005-001.tex Due date: Wed June 29, 2005

Instructions: Please supply your solution(s) by the due date in the space provided below. Continue on to the back of the sheet if you need more space. If you turn in additional sheets please staple them in order to the back of this sheet and put your name on each sheet. For additional comments and instructions check my webpage <http://oregonstate.edu/~peterseb>

Problem 1.1 Let $f(x) = e^{\sin(x)}$. Given that $|f^{(5)}(x)| \leq 25$ for all x answer the following questions: **(A)**. Compute the Taylor polynomial $P_4(x)$ of degree 4, with center at the origin, for $f(x)$, **(B)**. For each x use the Taylor remainder to estimate the error in the Taylor polynomial found in **(A)**, when viewed as an approximation of $f(x)$. **(C)**. Use your error estimate to find a bound on the absolute error in $P_4(1/2)$ as an approximation to $f(1/2)$. **(D)**. Use your calculator to compute $f(1/2)$ and then find the actual error in $P_4(1/2)$. Comment on how well it agrees, or does not agree, with your error bound in **(C)**.