

Homework 1

Due 10/4/2019

1. (Problem 2, page 18) Find the degree 2 Taylor polynomial for $f(x) = e^x \sin x$, about the point $a = 0$. Bound the error in this approximation when $-\pi/4 \leq x \leq \pi/4$.
2. (Problem 5, page 18) How large should the degree $2n - 1$ be chosen so that

$$|\sin x - p_{2n-1}(x)| \leq 0.001$$

for all $-\pi/2 \leq x \leq \pi/2$? Check your answer by evaluating the resulting $p_{2n-1}(x)$ at $x = \pi/2$.

You are recommended to do Matlab Practice 1 posted on Canvas and course website before doing the following problem. Do not submit the practice problems.

3. Write Matlab code using “For” loop to compute the following sum:

$$\sum_{k=1}^{10} \frac{e^k}{1.3.5 \dots (2k+1)}$$

In your submitted paper, make sure to write a few comments on how you do it.