Calculus II (Math 242) – Homework

Recall that

$$\sinh x = \frac{e^x - e^{-x}}{2} \quad \text{and} \quad \cosh x = \frac{e^x + e^{-x}}{2}.$$

Then $\sinh' x = \cosh x$ and $\cosh' x = \sinh x$.

1. Find the Taylor series of $\sinh x$.
2. How small with the remainder (error) be on the interval $[0, .2]$ if you take the first 10 terms of the series?
3. How small with the remainder (error) be on the interval $[0, 2]$ if you take the first 10 terms of the series?
4. How many terms do you need to make sure that the error is less than 10^{-6} for all x in the interval $[0, 1/2]$.
5. Confirm your computations graphically. Use WXMaxima or DfW to produce supporting evidence.

Repeat above program with $f(x) = \sin x$.