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Assignment 2 Writeup

Based on my results, I noticed that there were certain functions I implemented that produced accurate results compared to the built-in “math.h” library. These functions included the Tangent and Exponent. The other two functions, Sine and Cosine, were less accurate and had a greater change between the two results for certain numbers between $\pm \pi /16$.

These results are due to the use of less terms in the Horner Normal Form equation. This equation could have more terms to increase the accuracy and minimize the difference between the two results. When looking between $\pm \pi /3$ for sine, cosine, and tangent, the results are considerably accurate. Therefore, as the numbers get further from zero in each direction (positive or negative), the amount of change increases due to the simplified version of the Horner Normal Form equation.

I believe that using the Maclaurin Series equation to calculate exponents from 0 to 9 in steps of 0.1 allowed me to calculate accurate results. Utilizing epsilon to find my last term allowed me to check for the minor change of a number greater than 0.000000001 to a number less than 0.000000001. I do know that once calculating numbers outside of the range 0 to 9 that the accuracy lessens, and the results begin to diverge. Therefore, range also was important to this assignment in understanding how these equations aren't perfect.