Assignment 2 Design

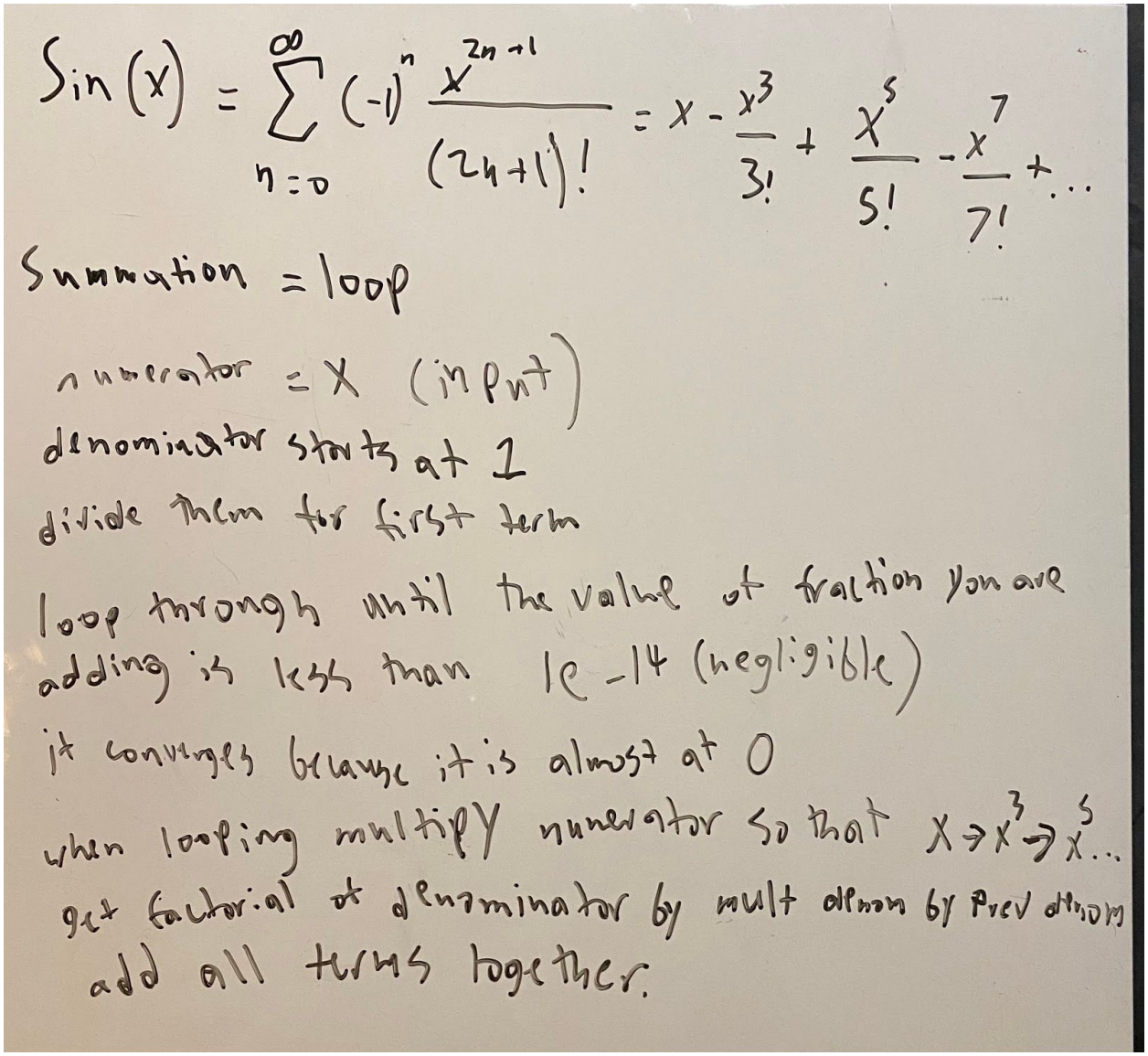
Pseudocode

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!}$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \ldots = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$$

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

Sine:



Cosine:

Similar structure to sine except start with adding 1, start k = 2, and start with numerator squared

// update: start with x^0 (1), start at k = 2 in loop and increment by 2
Add power of 2 each iteration and increase factorial

Tangent:

Tangent will be a function that returns sin(x) / cos(x)

Check is cos(x) = 0? To see if undefined

e^x:

Start at 1 and increment by 1
Each new term is going to be x/k multiplied by the old term
Sum each term together

Log:

$$x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$$ - >

- $y_{n+1} = y_n + \frac{x - e^{y_n}}{e^{y_n}}$

In the loop:

Start at y, add y + difference between input and e^y and divide that by e^y
e^y is changing every time because y is changing
End loop when e^y - x is less than epsilon

For lab write up:

Show graphs of each function
Show difference between our mathlib and C mathlib