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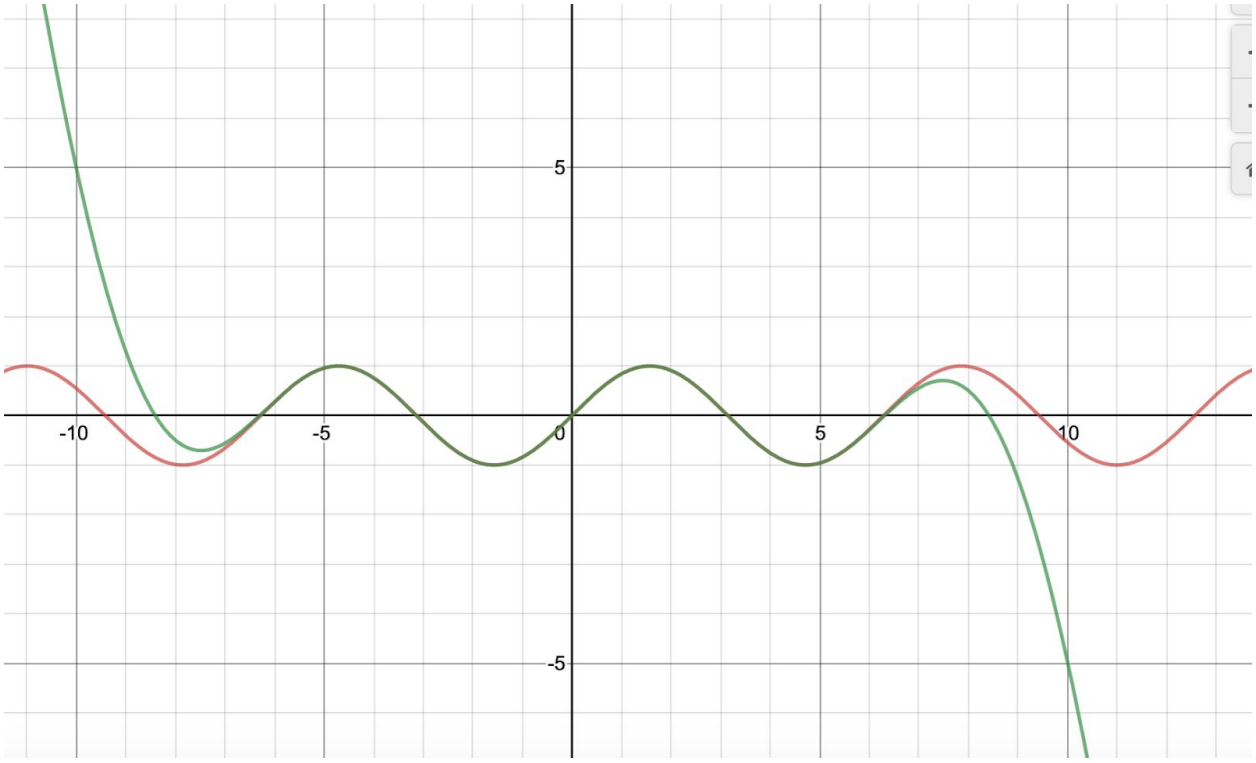
Assignment 3 writeup

For this assignment we were instructed to create a program which would take in a command line and print out the comparison of the library functions and the calculated functions we created for sine, cosine, tangent, and e^x. Each different comparison had a different parameter for sine and cosine it was -2pi to 2pi, for tangent it was -(pi/2 - .001) to (pi/2 - .001) and finally for e^x its 0 - 10. For the trig functions(sine,cos,tan) we would calculate the values using a pade approximation, and for e^x we would use a taylor series. For this assignment we used an approximation which was if i'm not mistaken a 15 pade approximation meaning that the closer to zero the tested value reached the more accurate approximation, the same goes for cosine, however the reason that tangent was more accurate is because tangent has a smaller approximation(-pi/2 to pi/2). As the teaching assistant mentioned the reason why the professors values are more precise is due to the fact that the pade approximation he used was more accurate than the one we were prompted to use. For e^x we used a taylor series, a taylor series can be written as a loop as it is simply incremented fractions. Personally I used a loop for my taylor series(a loop in a loop for the denominator). For the pade approximation we were provided with the formula. Below are photos of the graphs compared to the approximations, due to the inability to zoom in I cannot show you that even close to the outer parameters the values are still off. The graph below is sine, cosine, and tangent: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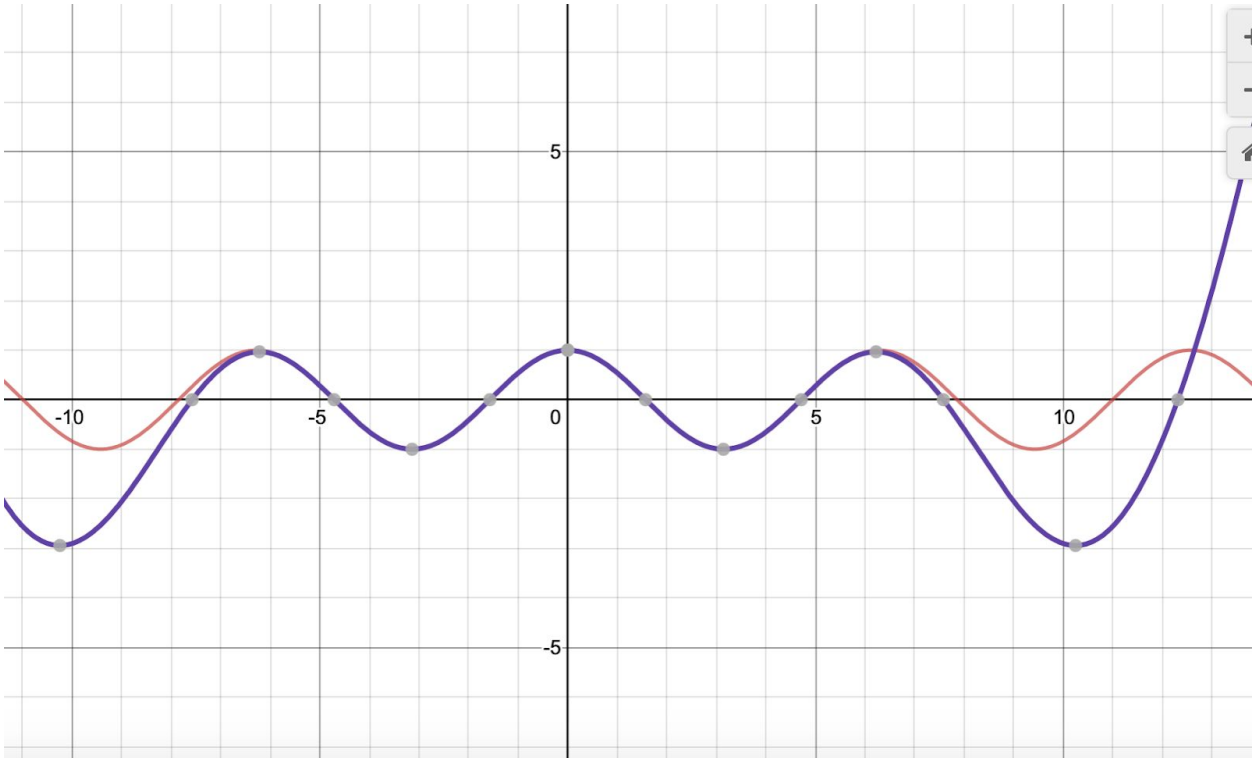
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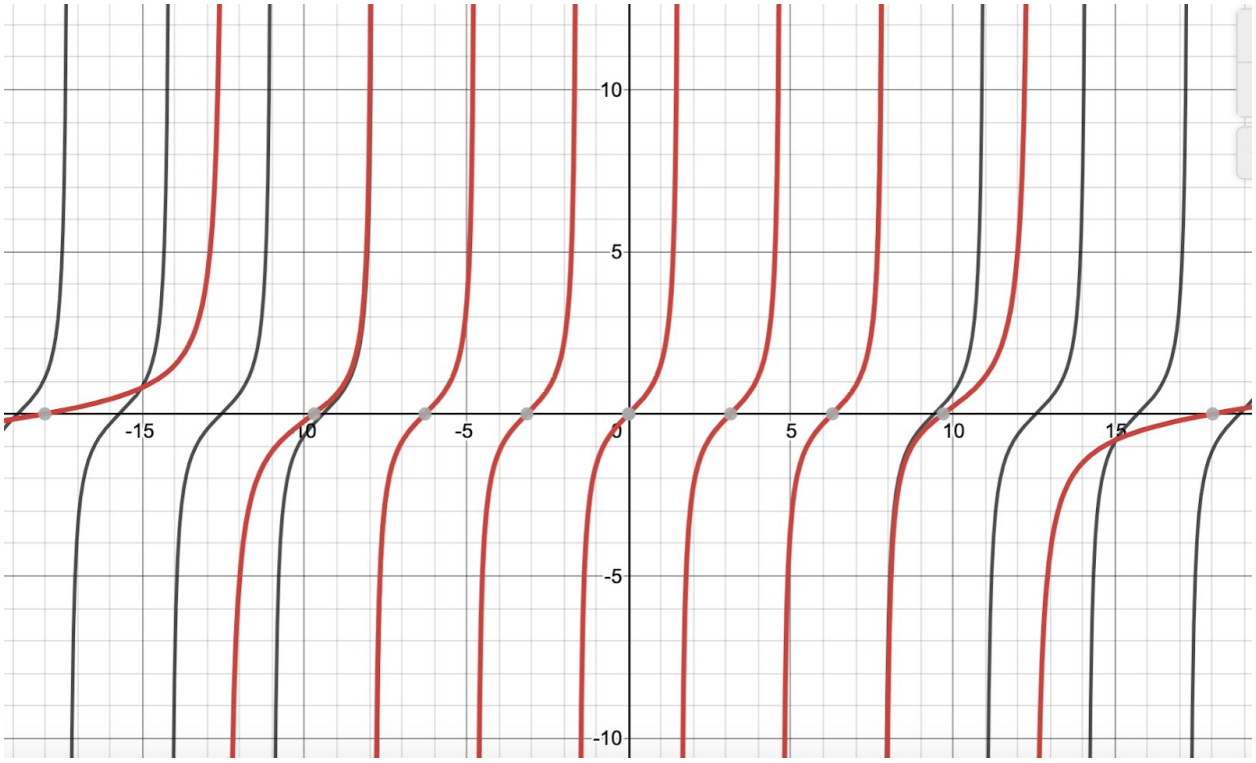
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