Computing Assignment 5

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Chart, scatter chart

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Description automatically generated I firstly chose my values to be , as these values give a large range and are evenly spaced. I thencalculated equally spaced nodes on [-1, 1] given by the equation . I then calculated the interpolating polynomial for functions and . I then calculated Chebyshev nodes given by for as well as a third function; Then, for all 5 of my interpolating polynomials calculated, I found the error for each using the equation . I then made a plot of vs for each function. These plots can be seen below.

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I found that the Chebyshev nodes seems to be more accurate, but do not seem to be robust against trigonometric functions. I then calculated the smallest value of (to within ) such that to be for the trigonometric function . Which shows the lack of robustness for Chebyshev nodes, as all other functions interpolated using Chebyshev nodes achieve this accuracy much quicker (within ).