MATH 3312 Fall 2024

Programming 1 Due: Sep 11th, 2024

Question 1

Consider the function $f(x) = \dfrac{\sqrt{1+x}-1}{x}$.

(a) Use Matlab to evaluate the function value (without changing the form of the function) at $x = 0.1, 0.01, 0.001, \cdots, 10^{-20}$.

(b) Plot $f(x)$ using the function values in Part (a). You might use logarithm scale for the x-axis to clearly present the curve.

(c) Is the above calculation consistent with $\lim_{x\to 0} f(x)$ and how do you explain it?

(d) Rewrite the function as, $f(x) = \dfrac{1}{\sqrt{1+x}+1}$, then redo the calculation (a)–(c).