1. Consider the following two Taylor’s series:

\[ \log(1 - x) = -\sum_{k=1}^{\infty} \frac{x^k}{k} \quad (1) \]

\[ \log \left( \frac{1 + x}{1 - x} \right) = 2 \sum_{k=1}^{\infty} \frac{x^{2k-1}}{2k - 1} \quad (2) \]

(Note: \( \log \) in Matlab means the natural logarithm, base \( e \), \( \log_{10} \) is the log base 10. The above are meant to be the natural logarithm.)

(a) To get \( \log(1.9) \), what value of \( x \) must be used in (1)?

(b) Write a script in Matlab to demonstrate how many terms are necessary to achieve ten digits of accuracy.

(c) Do the same as (a) for series (2).

(d) Do the same as (b) for series (2).

(e) Which of (1) or (2) is more efficient for computing \( \log(1.9) \)? Briefly explain your reasoning.

2. Write a script in Matlab to create a table of values (similar to Table 2.7) obtained by evaluating a given function as it is written, and also as a reformulation designed to eliminate loss-of-significance errors. Choose \( x \) from \( 10^{-1} \) to \( 10^{-20} \) decreasing by 0.1.

(a) Apply your script to the function described in Problem 5e in Section 2.2, and an appropriate reformulation. Comment on what is happening and why.

(b) Apply your script to the function described in Problem 6b in Section 2.2, and an appropriate reformulation. Comment on what is happening and why.