

MATH 4334.001/CS 4334.001 Name : _____
Fall 2023
Paper Homework 4
Due 09/18/2023

Show ALL work to receive full credit.

1. Calculate $f(10^{-2})$ for the function

$$f(x) = e^x - x - 1$$

using five significant digits. Then compare this by evaluating $f(10^{-2})$ directly by using $e^{0.01} \approx 1.0101$.

2. Determine the values of x for which there is loss of significance in evaluating the function

$$f(x) = \frac{1 - (1 - x)^3}{x}$$

Then find an alternative form that avoids the problem.

3. Write a function that computes accurate values of

$$f(x) = \sqrt[4]{x+4} - \sqrt[4]{x}$$

for positive x .

4. Calculate both zeros of

$$3x^2 - 9^{14}x + 100 = 0$$

correct to 3 significant digits.