Appendix C - Turn-in Sheet

Problem 1: OUT OF RANGE ERROR

Please turn in a program that shows what the largest factorial number you can exactly calculate.

The largest factorial that can be represented with regular `int` type is 15.

The largest factorial that can be represented with a `long int` type is 20.

Problem 2: ROUND-OFF ERROR

Please turn in the program you wrote to calculate the values in the following chart.

Using a `float`

x1 = -.000976562 %error from actual root = 2.34375

x2 = -3000 %error from actual root = 0

Using a `double`

x1 = -.001 %error from actual root = 2.36469e-09

x2 = -3000 %error from actual root = 0

Given the fact that each root can easily be represented in a float. Why do you think that there was error using the floating point? Be as specific as you can. You might write your answer on the back of this sheet.

Floating point error cannot be easily solved with real numbers, and it ends up rounding because it can only round so much even if it has more space.

Problem 3: TRUNCATION ERROR

How many terms do you need to include in the power series expansion until the digital value remains unchanged?

answer for `float` type: 35

answer for `double` type: 35

Problem 4: ERROR PUZZLE

What is the error for the summing the first 100 terms in the power series from largest to smallest.

answer for `float` type: 3.04e-6

answer for `double` type: 7.59e-7

What is the error for the summing the first 100 terms in the power series from smallest to largest.

answer for `float` type: -5.7e-6

answer for `double` type: -2.4e-7

Why do you think it makes a difference as to whether you sum forward or backwards?

Starting with larger numbers made the error occur early because there are more decimals to round, so error propagates more.