Assignment #1

Due Wednesday 8 September, 2021 at the start of class.

Submit on paper or by email: elbueler@alaska.edu

Exercise 1.1.1 in Section 1.1.

Exercise 1.1.3 in Section 1.1.

Exercise 1.1.4 in Section 1.1.

Exercise 1.2.1 in Section 1.2.

Exercise 1.2.5 in Section 1.2. *Hint. Recall $f^{-1}(f(x)) = x$ by definition.*

Exercise 1.2.7 in Section 1.2. *Typo in the problem!*

The polynomial in part (a) should be $x^2-(2+\epsilon)x+1$ not $x^2+(2+\epsilon)x+1$.

P1. The terms *overflow* and *underflow* are defined on page 12 of the textbook.

(a) Describe a calculation on two valid double precision floating point numbers which causes overflow. Confirm this in MATLAB.

(b) Describe a calculation on two nonzero valid double precision floating point numbers which causes underflow. Confirm this in MATLAB, showing that the result is really zero. (*The result would not be zero in exact arithmetic.*)

(c) Confirm in MATLAB that 10^{-310} does not underflow to zero but that 10^{-330} does. What is going on? (*See the text, and the footnote, on page 12.*)