

Quiz Date: Friday, 18 January, 2019

Textbook Reading: Section 1.2 (floating-point arithmetic) & 6.1 (Gaussian elimination).

Reminder: solutions will not be posted, but the TAs are expecting you to bring your questions to the tutorials. You bring questions to the Wednesday afternoon office hours.

1) **Basic Ideas**

Know the definitions of the following:

- finite-precision, floating-point representation of real numbers,
- absolute and relative errors,
- row operations,
- augmented matrices.

How do catastrophic losses of relative error occur in finite-precision arithmetic?

2) **Finite-Precision, Floating-Point Arithmetic**

Textbook problems from Section 1.2:

#1 absolute versus relative error.

#5 but use the **Matlab floating-point notation**, not the textbook notation! Also, you need only consider rounding — it is what Matlab does. These are just for practice, but be sure you understand how carry & digit-loss happens.

#7 sequential pair-wise arithmetic — be sure to properly round the fractions. Note that $a + b + c$ means $(a + b) + c$.

#14 illustration of two types of finite approximations.

#15 part (a) only.

#23 use $fl.m$ from lecture.

#28 a theory-lite question.

3) **Gaussian Elimination Warm-Up**

Textbook problem from Section 6.1:

#3 (a) in addition to two-digit rounding arithmetic, use the augmented matrix notation, and make the list of row operations required to achieve upper triangular form. Use the E_j and \rightarrow notations, following the example from page 367.