Homework 1
Math 151A: Numerical Methods
Due: In class Wed, January 17

1 Pen and paper

1. What is the smallest positive integer not in the 64 bit IEEE binary floating point numbers?
2. Burden and Faires, Section 1.2, Problems 3, 5, 15.
3. Burden and Faires, Section 2.1, Problems 1,3.

What You Should Turn In: Submit your written solutions along with the work deriving them.

2 Programming

1. **Plot with Matlab/Octave**: The purpose of this assignment is to have you become familiar with the software programs that you will be using to do the computational assignments for this class. You will be using Matlab. Matlab is available in the PIC lab (2000 Math Sciences). For home use, one can purchase a student edition of Matlab online or one can use the Matlab clone GNU octave that is available for Windows, Linux and Mac OS systems.

   In this assignment you will download, modify, and then execute a script (an m-file) that plots $\sin(x^2)$ for $x \in [0, 2\pi]$. You will then save the plot as a pdf file. To turn in this assignment, you will upload your modifed script and the pdf of the plot to the CCLE course website.

   (i) Verify that using Matlab (or Octave) you can create and save a plot of $\sin(x)$ for $x \in [0, 2\pi]$. Create a class directory for your all your 151A assignments, and then a subdirectory for Assignment 1. Download Assignment1.m to your Assignment 1 sub-directory. Start up Matlab or Octave and change the directory to your Assignment 1 sub-directory. Using the command prompt, run the script Assignment1.m: If you are using the Matlab or Octave IDE, open the file in the editor and select "Run" -or- type the name of the script (m-file) without the .m extension, Assignment1, at the command prompt, e.g.

   >> Assignment1

   Create a *.pdf file of the resulting plot with the name Sin.pdf. From the plot window, select File/Save As and specify "Sin.pdf" -or- Execute the command

   >> print('Sin.pdf','-dpdf')

   (ii) Modify, and then run Assignment1.m so that it creates a plot of $\sin(x^2)$ for $x \in [0, 2\pi]$. Save the plot in a file "Assignment1.pdf".

What You Should Turn In: Print your modified version of Assignment1.m and the file Assignment1.pdf. Before submitting your plot, have a look at it and make sure it is a plot of $\sin(x^2)$ for $x \in [0, 2\pi]$.