Homework #4

Math 4257/5257
Due Midnight, November 3

- Create a script file that performs calls the appropriate .m files for the following problems. Publish the report as an html file. Zip all the .m files, figures and html file together and upload zip file to the dropbox in D2L.

1. (15 points) Write an m-file *secant.m* to program the secant method

$$x_{n+1} = x_n - \frac{f(x_n)}{s_n}$$

   where

$$s_n = \frac{f(x_n) - f(x_{n-1})}{x_n - x_{n-1}}$$

   Test your secant method code by outputting each iteration for the function

$$f(x) = x^2 - 2.$$

   Make sure the iterations match those given on page 122 of your textbook, *Numerical Computing with MATLAB* by Cleve Moler.

2. (20 points) Number 4.3 (b)-(f) in your textbook, *Numerical Computing with MATLAB* by Cleve Moler.

3. (5 points) Number 4.4 in your textbook, *Numerical Computing with MATLAB* by Cleve Moler.

4. (10 points) Number 4.5 in your textbook, *Numerical Computing with MATLAB* by Cleve Moler.

5. (20 points) Number 4.14 (for part (c) use spline or splinetx instead of the method given) in your textbook, *Numerical Computing with MATLAB* by Cleve Moler. Hint: You need to construct a function for which you will need to use fzero to find a zero. For an example, think about how your book looked for $\sqrt{2}$ - what function did they use?

- **Graduate Students:** An email will be sent when the next graduate student assignment is posted.