**Math 302: Problem Set 8**

Due: November 12, 2009

Email me your m-files and results as attachments in ONE email with each m-file having the format `firstname_lastname_prob.m`. Be sure to comment your code so I can follow it.

We will be constructing the Sierpinski Triangle by random repetition of a few simple transformations. For each step a random number is generated and dependent on the number one of three possible transformations occur. Your new program `drawTriangle.m` should successively generate a random number and should

- apply $x = .5x$, $y = .5y$ with probability $1/3$
- apply $x = .5x + .25$, $y = .5y + \frac{\sqrt{3}}{4}$ with probability $1/3$
- apply $x = .5x + .5$, $y = .5y$ with probability $1/3$

starting with $x = 0$ and $y = 0$.

This recursion should occur a user-defined $n$ times. You should accomplish this with a single if clause, although, given that your logic now forks three ways, you will want to make use of some subordinate `elseif` statements.

To take advantage of the matrix-vector operations of Matlab, redefine the operations in terms of matrix-vector operations. In other words, let $z = [x, y]^T$.

To make your code run faster `plot` should be applied only once for the whole program (not $n$ times). In other words, the `plot` should be outside your main loop.

*Grading: 21 pts for correct matrix representation, 24 pts for plot called* `triangle.jpg` *for* $n = 10000$*, 5 points for correct function header, 15 points for correct loop, 15 pts for code, 10 points for correct indentation, 10 pts commenting*