**ECEn 370**

**Homework Problem Set 8**

Due on Friday, March 2, 2012.

From Bertsekas and Tsitsiklis, *Introduction to Probability, 2nd Ed.* A little bit lighter due to the exam.

1. (5 pts) Chapter 4 Problem 1
2. (5 pts) Chapter 4 Problem 5
3. (5 pts) Chapter 4 Problem 6
4. (5 pts) Chapter 4 Problem 8
5. (30 pts) MATLAB Problem. This will show you how to simulate derived distributions.
   The file hw8.m on the website will show you an example of appropriate graphs. Use 10,000 points for each of these problems. Turn in your code, your graphs, and your analysis for each of the following sections.

   Chapter 4 Problem 1 (do this for both $\sqrt{|X|}$ and $-\ln|X|$)
   - Plot the pdf of $X$. This is a histogram of the vector $X$.
   - Plot the histograms of the derived distributions for the two cases in the problem.
   - Compare your graphs with the analytical derivation done above-do they agree?

   Chapter 4 Problem 5
   - Plot the field of generated $X$ and $Y$ (you've done this many times).
   - Compute a vector $Z$ which is $|X - Y|$.
   - Find the CDF of $Z$ by using a for loop for $z$ from -1 to 3 and incrementing and finding all of the values less than a particular $z$.
   - Plot the CDF of $Z$ that you found above.
   - Plot the pdf of $Z$. This is a simple histogram of the vector $Z$.
   - Compare your plots with the analytic solutions derived above.

   Chapter 4 Problem 8
   - Plot the field of generated $X$ and $Y$ using the parameter $\lambda = 1$. This should look skewed because they are not uniform.
   - Compute a vector $Z$ which is $X + Y$.
   - Plot the histogram of $Z$.
   - Compare your plot with the analytic solution you derived above.