A. Problems to Submit

1. BE Exercise: 8.15 (**not part (j)**).

   - For BE 8.15, you must justify each result using a theorem(s) and/or definition(s); that is, you will NOT get full credit for just listing the distribution.
   - **Do skip BE 8.15(j)** as this distribution was not covered in class (or you could do a little Googling to figure it out (*before looking in the back of the book*)!).

2. Let X_i for $i = 1, 2, 3$ be independent random variables with $N(i, i^2)$ distributions. For each of the following situations, use the X_i's to construct a statistic with the indicated distribution. That is, your solution to each part below should be a function of **ALL THREE** X_i's.

   (a) Chi-square distribution with 3 degrees of freedom.

   (b) Student t distribution with 2 degrees of freedom.

   (c) F distribution with 1 and 2 degrees of freedom.

3. BE Exercises: 8.13, 8.18.

   - For the BE exercises listed above, you may use R or statistical tables to find the probabilities. However, you are encouraged to do it both ways for practice.

B. Additional Practice Problems

1. BE Exercises: 8.1, 8.11.

   - For the BE exercises listed above, you may use R or statistical tables to find the probabilities. However, you are encouraged to do it both ways for practice.

2. Suppose that $Z_1, \ldots, Z_n$ is an iid sample from $N(0, 1)$. Using the MGF approach ...

   (a) Show that Z_1^2 follows a chi-square distribution with 1 degree of freedom.

   (b) Show that $Z_1^2 + \ldots + Z_n^2$ follows a chi-square distribution n degrees of freedom.

3. Prove the following theorems given in the course text (*before looking in the text*)!).

   (a) ***Theorem 8.3.1***.

   (b) ***Theorem 8.3.3***.

   (c) ***Theorem 8.3.4***.

4. BE Exercise: 8.4.