Math 408, Spring 2008
HW Assignment 11, due Friday, 4/18/2008

Name (print please):

Instructions

- **Use this sheet as cover sheet and staple it to the assignment.** Write your name **legibly** in the space above; if necessary, underline your last name. If your name is not clearly and unambiguously identifiable on the class roster, we cannot credit you for the homework.
- Do the problems in order, and make sure that each problem is clearly labelled.
- Show all work; an answer alone will not earn credit.
- **Due date:** The assignment is due **in class** on Friday. Late homework, or homework dropped off in mailboxes, will not be accepted. You can, however, turn in the homework early, in my office, 241 Illini Hall, any time before the due date.

Problems (from Hogg/Tanis, 7th edition)

1. 5.2-2 (a)(c)(e)(g) (i.e., all parts in the left column)
2. 5.2-4 (a)(b)
3. 5.2-5 (a)(b)
4. 5.2-7 (a)(c)(e)(g) (i.e., all parts in the left column)
5. 5.2-9 (a)(b)
6. 5.4-1
7. 5.4-2
8. 5.4-4
9. 5.4-6
10. 5.4-12

***** Turn page for instructions and comments *****

Instructions/comments on the problems in HW 11

- **Section 5.2 problems:** These problems reduce to simple exercises in looking up values in the normal table. It does take some practice to get proficient in such table look-ups (that's the point of the exercises in this section), but in terms of mathematical complexity this is about as easy as it gets. Here are some tips for this:

  - **Use the normal table:** If you have a calculator with built-in Φ-function, don't use it to get values of $\Phi(z)$. Instead look up values from the normal table. In exams you can only use the table, so you should practice using it.
  - **Note on "in-between" values:** If a value for $\Phi(z)$ is not in the table, just pick the nearest value in the table. There is no need to do anything more sophisticated (e.g., interpolation).
  - **Note on other values not in the table:** The table does not contain entries corresponding to negative z-values, or z-values that are bigger than 3 or 4. In the first case, convert to positive z-values using the formula $\Phi(-z) = 1 - \Phi(z)$. In the second case, i.e., if z is too big to be in the table, $\Phi(z)$ would be equal to 1 to withing several digits accuracy. However, this is quite unlikely to arise in a problem, so if you come across such a situation, chances are that you made a mistake.

- **Section 5.4 problems:** These problems are applications of the Central Limit Theorem, in the context of random samples. They all follow the same pattern: You are given a random sample of independent r.v.'s with a given distribution, and you need to compute probabilities involving either the sample sum or the sample mean. To do this, approximate the sum or mean by a normal distribution with appropriate parameters (the CLT handout has all the relevant formulas), then compute the corresponding probabilities using this normal approximation, in much the same way as the problems from Section 5.2. For some problems, the parameters μ and σ (i.e., the mean and standard deviation of the **individual** r.v.'s) are not directly given, so you need to compute these first, but this is usually very easy.