

## Assignment #21

Due on Wednesday April 23, 2008

**Read** Section 5.7 on *The Central Limit Theorem*, pp. 282–290, in DeGroot and Schervish.

**Read** Section 4.8 on *The Sample Mean*, pp. 229–235, in DeGroot and Schervish.

**Do** the following problems

1. Forty–eight measurements are recorded to several decimal places. Each of these 48 numbers is rounded off to the nearest integer. The sum of the original 48 numbers is approximated by the sum of those integers. Assume that the errors made in rounding off are independent, identically distributed random variables with a uniform distribution over the interval  $(-0.5, 0.5)$ . Compute approximately the probability that the sum of the integers is within two units of the true sum.
2. Let  $X$  denote a random variable with pdf

$$f_X(x) = \begin{cases} \frac{1}{x^2} & \text{if } 1 < x < \infty, \\ 0 & \text{otherwise.} \end{cases}$$

Consider a random sample of size 72 from this distribution. Compute approximately the probability that 50 or more observations of the random sample are less than 3.

3. Exercise 5 on page 235 in the text
4. Exercise 6 on page 235 in the text
5. Exercise 8(a) on page 235 in the text