

Stat 252 Winter 2006  
Assignment #3

This assignment is due at the beginning of class on Friday, January 27, 2006. You must submit all problems that are marked with an asterisk (\*).

**1.** Do the following exercises from Wackerly, et al.

- page 323 #6.64
- page 324 #6.65

**2.** \* Suppose that  $Y_1, \dots, Y_n$  constitute a random sample of size  $n$  from a population with a uniform distribution on the interval  $(0, \theta)$ , where  $\theta$  is unknown. In order to estimate  $\theta$  we will consider the estimator

$$\hat{\theta} = \min(Y_1, \dots, Y_n).$$

- (a) Quickly write down the density of  $Y_1$ .
- (b) Compute the density of  $\hat{\theta}$ .
- (c) Using your density from (b), find  $\mathbb{E}(\hat{\theta})$ .
- (d) Is  $\hat{\theta}$  an unbiased estimator of  $\theta$ ? Why or why not? If it is not an unbiased estimator, then find an estimator of  $\theta$  which *is* unbiased.

*(Note: This exercise outlines a different approach to solving 8.14, page 370 in the text.)*