Biology 4605/7220   Name _____
Quiz #5a   7 October 2002

1. Here is the probability statement for the confidence limits on a variance:

$$P\left\{ L_{lower} \leq \sigma^2 \leq L_{upper} \right\} = 1 - \alpha$$

$$P\left\{ \frac{(n-1)s^2}{\left(X^2_{\alpha/2[n-1]}\right)} \leq \sigma^2 \leq \frac{(n-1)s^2}{\left(X^2_{1-\alpha/2[n-1]}\right)} \right\} = 1 - \alpha$$

Using a value of $\alpha = 5\%$, compute the upper and lower limit on the variance in glutamic acid in gorillas (Data from exercise 8.1 in Sokal and Rohlf 1995).

n = 6 $s^2 = 0.12442$

$1 - \alpha/2$	$X^2\_df=5$	$X^2\_df=6$	$X^2\_df=7$
0.025	0.8312	1.2373	1.6899
0.050	1.1455	1.6354	2.1673
0.100	1.6103	2.2041	2.8331
0.900	9.2364	10.6446	12.0170
0.950	11.0705	12.5916	14.0671
0.975	12.8325	14.4494	16.0128

L_{lower} = _____

L_{upper} = _____

2. If you increase the sample size n from 6 to 8, what happens to $X^2_{\alpha/2[n-1]}$?

3. If you increase the sample size n from 6 to 8, does the confidence limit increase or decrease ?