Name:	Date:
Elementary Statistics	HW 7.4 part 2

 Listed below are speeds (mi/h) measured from southbound traffic on I-280 near Cupertino, California. This simple random sample was obtained at 3:30PM on a weekday. Assume the data is from a population that is normally distributed and you are want to construct a 95% confidence interval estimate of the population standard deviation.

62 61 61 57 61 54 59 58 59 69 60 67

- a. Identify the following values:
  - n = df = s =
- b. Find the critical values,  $\chi^2_L$  and  $\chi^2_R$ 
  - CL =  $\alpha = \frac{\alpha}{2}$ Area to the right of  $\chi_L^2 = \chi_L^2 =$ Area to the right of  $\chi_R^2 =$ Area to the right of  $\chi_R^2 =$
- c. Construct the 99% confidence interval estimate of the population standard deviation,  $\sigma$ . (Round your final answers to the hundredths place.)



- d. State the confidence interval estimate for  $\sigma$  in context of the question.
- e. Does the confidence interval describe the standard deviation for all times during the week?

For questions 2 and 3, use Table 7-2 to find the indicated sample size.

Table 7-2		1	
Sample Size for $\sigma^2$		Sample Size for $\sigma$	
To be 95% confident that s <sup>2</sup> is within	of the value of $\sigma^2$ , the sample size <i>n</i> should be at least	To be 95% confident that s is within	of the value of $\sigma$ , the sample size <i>n</i> should be at least
1%	77,207	1%	19,204
5%	3,148	5%	767
10%	805	10%	191
20%	210	20%	47
30%	97	30%	20
40%	56	40%	11
50%	37	50%	7
To be 99% confident that s <sup>2</sup> is within	of the value of $\sigma^2$ , the sample size <i>n</i> should be at least	To be 99% confident that s is within	of the value of $\sigma$ the sample size $r$ should be at leas
1%	133,448	1%	33,218
5%	5,457	5%	1,335
10%	1,401	10%	335
20%	368	20%	84
30%	171	30%	37
40%	100	40%	21
50%	67	50%	13

- 2. You want to estimate the standard deviation for the population of wait times at McDonald's drive-up windows, and you want to be 95% confident that the sample standard deviation is within 20% of the population standard deviation.
  - a. Find the minimum sample size.
  - b. Is this sample size practical?
- 3. You want to estimate the variance for all arrival delays for American Airlines flights from Chicago to Miami. Find the minimum sample size needed to be 99% confident that the sample variance is within 5% of the population variance.