Stat Quiz Practice # 11 Date:_____ Section: _____ Name: _____

For quiz # 11, you also need to review quizzes 8, 9 and 10 Determining the sample size
One of the most common questions any statistician gets asked is \How large a sample size do I need?" Researchers are often surprised to find out that the answer depends on a number of factors and they have to give the statistician some information before they can get an answer! As with all our examples so
far, the answers are essentially different depending on whether the study is a survey designed to find out the proportion of something, or is designed to find a sample mean.

1) You want to construct a 90% confidence interval for the percent of registered voters who are planning on voting for the current governor for his second term. You want to have a margin of error of 0.03. How many registered voters should you survey? $n = 752$

2) How large a sample must we take to obtain 90% confidence interval estimate of the proportion of students who pass stat class for the first time, if the max. error of our confidence width to be .10? $n = 271$

3) A consumer agency wants to estimate the proportion of all drivers who were seat belts while driving. Assume that a prior study has shown that 46% of drivers wear seatbelts while driving. How large the sample size be so that the 95% confidence interval for the population proportion has a maximum error 0f .04? $n = 597$

4) How large should the sample size be if we want to estimate the true average time to finish a refinance application with 99% confidence level when previous study results with a st. dev of 20 and the error is accepted to be 4 min? $n = 166$

5) How large should the sample size be if we want to estimate the true average time to finish a refinance application with 99% confidence level when previous study results with a st. dev of 20 and the maximum error is accepted to be 2 minutes? **What happened to sample size when error was cut in half?**

6) What should be the sample size for a 95% confidence interval for μ to have a maximum error equal to .50 and standard deviation equal to 8? $n = 984$

7) What should be the sample size for a 95% confidence interval for μ to have a maximum error equal to **1.0** and standard deviation equal to 8? What happened to sample size when error was doubled? $n = 246$

8) A researcher wants to determine the 99% confidence interval for the mean number if hours per week that adults spend doing community service. How large of a sample should the researcher select so that the estimate will be within 1 hour of the population mean? Assume that the standard deviation for hours spent per week by adults doing community service is 3 hours. $n = 60$

9) A survey estimated that 20% of all Americans aged 16 to 20 drove under the in influence of drugs or alcohol. A similar survey is planned for New Zealand. They want a 95% confidence interval to have a margin of error of 0.04.
(a) Find the necessary sample size if they expect to find results similar to those in the United States.
$n = 271$
(b) Suppose instead they used the conservative formula based on $\hat{p} = .5$ What is now the required sample size?
$n = 423$

10) What distribution do we use to estimate population mean when the population standard deviation is unknown?

11) If we increase the sample size and keep all other numbers the same, does the **Confidence interval for the proportion …**

A) *gets wider* ***B)*** *gets narrower* ***C)*** *becomes doubled* ***D)*** *Makes no difference*

12) If we decrease the confidence level and keep all other numbers the same, does the **Confidence interval for the proportion …**
A) *gets wider* ***B)*** *gets narrower* ***C)*** *becomes doubled* ***D)*** *Makes no difference*