STAT 1450, Quiz #7, Fall 2013 Name KEY

Instructions: Show all work. If you use your calculator to conduct the hypothesis tests or find confidence intervals rather than doing them by hand, show what your Test screen looks like, and the results after pressing calculate, along with your interpretation.

1. How many cars must be randomly selected and tested in order to estimate the mean breaking distance of registered cars in the United States? We want 99% confidence that the sample mean is within 2 feet of the population mean, and the population standard deviation is known to be 7 feet.

$$n = \left[\frac{z_{\alpha/2} \cdot \sigma}{E}\right]^2 = \left[\frac{2.575 \cdot 7}{2}\right]^2 = 81.225\ldots$$

$$\boxed{n = 82}$$

2. In a test of the Atkins weight loss program, 40 individuals participated in a randomized trial with overweight adults. After 12 months, the mean weight loss was found to be 2.1 lbs. with a standard deviation of 4.8 lbs. Construct a 95% confidence interval to estimate the mean of all overweight adults who follow the Atkins program. What can you conclude from this confidence interval?

$df = 39$

$$E = \frac{t_{\alpha/2}\, s}{\sqrt{n}} = \frac{2.708 \cdot 4.8}{\sqrt{40}} = 2.06$$

CI: $(.04, 4.16)$ weight loss is likely positive but small over one year.

3. For the statement "*That majority of college students have credit cards*", write down the null hypothesis and the alternative hypothesis.

$H_1: p > .5$

$H_0: p \leq .5$