AP Stats Ch 23 - Required Practice **Name: _____Per: ____**

#1. **Speed Limit** - The speeds of cars on a small road with a speed limit of 30 mph were monitored. The following speeds were observed:

29	29	24
34	32	36
28	31	31
27		

(a) Use a hypothesis test to determine whether or not the average speed of all vehicles on this road exceeds the speed limit.

(b) Use this sample to build a 90% confidence interval for the mean speed of all vehicles traveling on the road and interpret your interval.

#1 again (this time using t instead of z).

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26. Fuel economy. A company with a large fleet of cars hopes to keep gasoline costs down, and sets a goal of attaining a fleet average of at least 26 miles per gallon. To see if the goal is being met, they check the gasoline usage for 50 company trips chosen at random, finding a mean of 25.02 mpg and a standard deviation of 4.83 mpg. Is this strong evidence that they have failed to attain their fuel economy goal?

a) Write appropriate hypotheses.

b) Are the necessary assumptions to perform inference satisfied?

c) Describe the sampling distribution model of mean fuel economy for samples like this.

d) Find the P-value.

e) Explain what the P-value means in this context.

f) State an appropriate conclusion.

36. Braking. A tire manufacturer is considering a newly designed tread pattern for its all-weather tires. Tests have indicated that these tires will provide better gas mileage and longer treadlife. The last remaining test is for braking effectiveness. The company hopes the tire will allow a car traveling at 60 mph to come to a complete stop within an average of 125 feet after the brakes are applied. They will adopt the new tread pattern unless there is strong evidence that the tires do not meet this objective. The distances (in feet) for 10 stops on a test track were 129, 128, 130, 132, 135, 123, 102, 125, 128, and 130. Should the company adopt the new tread pattern? Test an appropriate hypothesis and state your conclusion. Explain how you dealt with the outlier, and why you made the recommendation you did.

2. t-models, part II. Using the t tables, software, or a calculator, estimate

a) the critical value of t for a 95% confidence interval with df = 7.

b) the critical value of t for a 99% confidence interval with df = 102.

c) the P-value for $t \leq 2.19$ with 41 degrees of freedom.

d) the P-value for $|t| > 2.33$ with 12 degrees of freedom.

8. Rain. Based on meteorological data for the past century, a local TV weatherman estimates that the region's average winter snowfall is 23″, with a margin of error of ±2 inches. Assuming he used a 95% confidence interval, how should viewers interpret this news? Comment on each of these statements.

a) During 95 of the last 100 winters, the region got between 21″ and 25″ of snow.

b) There's a 95% chance the region will get between 21″ and 25″ of snow this winter.

c) There will be between 21″ and 25″ of snow on the ground for 95% of the winter days.

d) Residents can be 95% sure that the area's average snowfall is between 21″ and 25″.

e) Residents can be 95% confident that the average snowfall during the last century was between 21″ and 25″ per winter.

Chapter 23 Practice Quiz

AP Statistics Quiz C – Chapter 23 ***Name*** _____

Textbook authors must be careful that the reading level of their book is appropriate for the target audience. Some methods of assessing reading level require estimating the average word length. We've randomly chosen 20 words from a randomly selected page in *Stats: Modeling the World* and counted the number of letters in each word:

5, 5, 2, 11, 1, 5, 3, 8, 5, 4, 7, 2, 9, 4, 8, 10, 4, 5, 6, 6

1. Suppose that our editor was hoping that the book would have a mean word length of 6.5 letters. Does this sample indicate that the authors failed to meet this goal? Test an appropriate hypothesis and state your conclusion.

2. For a more definitive evaluation of reading level the editor wants to estimate the text's mean word length to within 0.5 letters with 98% confidence. How many randomly selected words does she need to use?