Name: _____ **Date:** _____

Elementary Statistics **HW 8.5**

1. **The Jefferson Valley Bank once had a separate customer waiting line at each teller window, but it now has a single waiting line that feeds the teller windows as vacancies occur. The standard deviation of customer waiting times with the old multiple-line configuration was 1.8 min. The standard deviation of customer waiting times with the new single waiting line is 0.5 min.**

    a. When the bank changed from multiple waiting lines to a single line, how was the variation among waiting times affected?

    b. What procedure can be used to determine that a single waiting line is better?

2. **Using the data from question 1 and assume the data from Jefferson Bank is normally distributed and came from a simple random sample of 10 customers where s = 0.5 min. Use a 0.05 significance level to test the claim that this sample is from a population with a standard deviation less than 1.8 min (as it was in the past with multiple waiting lines.**

    Step 1: What is the claim in symbolic form? Also, state the "opposite of the claim"

    Step 2: What are the null and alternative hypotheses?

    Step 3: Is the test two-tailed, left-tailed, or right-tailed?

    Step 4: What is the value of α?

    Step 5: What is the critical value(s)?

Step 6: What is the value of the test statistic?

Step 7: Does the test statistic fall inside the critical region? So, should we reject the null hypothesis or fail to reject the null hypothesis?

Step 8: What is the written conclusion based on the original claim and your answer to part e?

3. **The Skytek Avionics company uses a new production method to manufacture aircraft altimeters. A simple random sample of 12 new altimeters resulted in the errors listed below and have a standard deviation of 52.44 feet. Use a 0.01 significance level to test the claim that the new production method has errors with a standard deviation greater than 32.2 feet, which was the standard deviation for the old production method. (Be sure to follow the 8 steps outlined in question #2)**