Worksheet 11

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1. A battery manufacturer claims their product has a life expectancy of 90 hours. An improvement production process is believed to make an increase in the life expectancy of batteries. A sample of 36 batteries showed an average life of 93 hours. Assume from past information, the standard deviation of the life expectancy is 9 hours.

    a. Formulate the hypotheses for this problem.

    b. Calculate the test statistic.

    c. Make a decision at 0.1 significance level. State your conclusion in terms of the problem.

    d. Make a decision at 0.01 significance level. What is your conclusion.

2. The average gasoline price of one of the major oil companies is \$1.75 per gallon. Because of cost reduction measures, it is believed that there has been a significant reduction in the average price. In order to test this belief, a sample of 36 of the company's gas stations were randomly selected and yielded an average price \$1.65 per gallon. Assume the standard deviation of the population is \$0.12.

   a. State the null and the alternative hypothesis for this problem.

   b. Calculate the test statistic.

   c. At 5% level of significance, test the company's claim.

3. To determine the average price of hotel rooms in Atlanta, a sample of 49 hotels was selected and yielded an average price of hotel rooms being $120. The population standard deviation was found to be $16.

   a. Formulate the hypotheses to determine whether the average price of hotel rooms is significantly different from $124.5.

   b. Calculate the test statistic.

   c. At 10% level of significance, use critical value approach to test the hypotheses. What is the conclusion?

   d. At 90% confidence, using the confidence interval approach to test the hypotheses. What is the conclusion?