state and complete the 5 steps of Hypothesis Testing

 You may use the p – method or the traditional method.

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*1. A manufacturer makes steel rods that are supposed to have a mean length of 50 centimeters. A retailer suspects that the bars are being produced too short. A sample of 46 bars is taken and their mean length is determined to be 51 centimeters with a standard deviation of 3.6 centimeters. Using a .01 significance level, test the retailers claim that the population mean is less than 50 centimeters.*

*2. According to a recent poll, 53% of Americans would vote for an incumbent president. If a sample of 100 people results in 45% who would vote for the incumbent, test the claim that the percentage is 53%. Use a .10 significance level.*

*3. An article in a journal reports that 34% of American fathers take no responsibility for child care. A researcher claims that the figure is higher for fathers in the town of Littleton. A random sample of 225 fathers from Littleton, yielded 97 who did not help with child care. Using a .05 level of significance test the claim that the proportion is at least 34%.*

*14.6 13.8 14.1 13.7 14.0 14.4 13.6 14.2*

*4. The world’s smallest mammal is the bumblebee bat. Such bats are roughly the same size of a large bumblebee. Listed below are the weights (in grams) from a sample of these bats. Assuming that all such bats have a standard deviation of .3 grams, use a significance level of .05 to test the claim that these bats are from the same population with a known mean of 1.8 grams. Do the bats appear to be from the same population ? You may assume the sample data comes from a population that follows a normal distribution.*

*2.13 1.31 1.91 1.92 1.77 1.64 2.29 1.99 2.33 2.49 2.22*

*5. In a clinical study of an allergy drug, 108 of the 203 subjects reported experiencing* *significant relief from their symptoms. Using a significance level of .01, test the claim that more than half of all those using the drug experienced relief.*

*6. A public bus company official claims that the mean waiting time for bus number 14 during peak hours is less than 10 minutes. Karen took bus 14 during peak hours on 18 different occasions. Her mean waiting time was 7.4 minutes. Assume that the standard deviation has been historically known to be 2.2 minutes. At the .05 significance level, test the claim that the mean waiting time is less than 10 minutes.*

*7. A cereal company claims that the mean weight of the cereal in its packets is more than 14 oz. The weights (in ounces) of the cereal in a random sample of 8 cereal packets are listed below. You may assume the sample data comes from a population that follows a normal distribution. Using a .05 level of significance test the company’s claim.*

 *8. According to Management Accounting, salary figures for certified management accountants (CMAs) who are in the field less than 1 year are normally distributed with a mean of $31,129. A random sample of 15 first-year CMAs in Denver produces a mean salary of $32,279, with a standard deviation of $1,797. Test the hypothesis that the mean for all Denver first-year CMAs is not equal to $31,129. Use the .05 level of significance.*

*9. A Patent Medicine Company supervisor assumes that the bottling machine is operating properly if only 5 percent of the processed bottles are not full. A random sample of 100 bottles had 7 bottles that weren’t full. Using a significance level of .01, conduct a test to see if the machine is operating properly.*

*10. The average time it takes for a person to experience relief from aspirin is 25 minutes. A new ingredient is added to help speed up relief. A study was conducted with 35 people that resulted in a mean of 22.1 minutes with a standard deviation of 1.9 minutes. Using a .05 significance level, test the claim that the mean amount of time relief will be felt is less than 25 minutes.*