Statistics **Practice Test 4** **Name:_____**

1. A recent report stated that 68% of the American population belongs to a religious community (church, synagogue, etc.). In a sample of 1000 Michigan residents, 720 indicated that they belong to a religious community. Is there evidence to support the claim that the percentage of all Michigan residents who belong to a religious community is different than 68%? Use $\alpha = 0.10$.

a. State the null and alternative hypotheses.

b. Find the value of the test statistic. Show the formula and your calculations.

c. Sketch the distribution of the test statistic (standard normal or Student's t) and shade the area corresponding to the p-value. Find the p-value.

d. Should you reject or fail to reject the null hypothesis?

e. State the conclusion in terms of the problem. (You may want to use the flowchart.)

2. Students investigating the packaging of tortilla chips purchased 10 bags of chips marked with a net weight of 24 ounces. They carefully weighed the contents of each bag, recording the following weights (in ounces):

23.3 23.2 23.1 23.1 23.3 23.6 24.2 24.0 24.1 24.0

Is the manufacturer underfilling the bags? Test the claim that the average weight of all similar bags of chips is less than 24 ounces. Use $\alpha = 0.10$ and assume that the original distribution is normal.

a. State the null and alternative hypotheses.

b. Find the value of the test statistic. Show the formula and your calculations.

c. Sketch the distribution of the test statistic (standard normal or Student's t) and shade the area corresponding to the p-value. Find the p-value.

d. Should you reject or fail to reject the null hypothesis?

e. State the conclusion in terms of the problem. (You may want to use the flowchart.)

3. In 1960, census results indicated that the age at which American men first married had a mean of 23.3 years. Suppose a researcher wants to find out of the mean age of first marriage has increased since then. She takes a sample of 25 men, and finds that these men married at an average age of 28.2. The sample standard deviation is 5.3 years. Test the claim that the mean age of first marriage is greater than 23.3 years. Use $\alpha = 0.05$ and assume that the original distribution is normal..

a. State the null and alternative hypotheses.

b. Find the value of the test statistic. Show the formula and your calculations.

c. Sketch the distribution of the test statistic (standard normal or Student's t) and shade the area corresponding to the p-value. Find the p-value.

d. Should you reject or fail to reject the null hypothesis?

e. State the conclusion in terms of the problem. (You may want to use the flowchart.)

4. A researcher estimates that the mean waste recycled by adults in the United States is more than 1 pound per person per day. A random sample of 31 adults is selected. For the sample, the mean waste recycled per person per day is 1.05 pounds. Suppose the population standard deviation is known to be 0.3 pound. At a 5% level of significance, is there enough evidence to support the researcher's claim?

a. State the null and alternative hypotheses.

b. Find the value of the test statistic. Show the formula and your calculations.

c. Sketch the distribution of the test statistic (standard normal or Student's t) and shade the area corresponding to the p-value. Find the p-value.

d. Should you reject or fail to reject the null hypothesis?

e. State the conclusion in terms of the problem. (You may want to use the flowchart.)