AP Statistics Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mini-Test: Hypothesis Test

1.) A 2002 study found that the prevalence of blue eye color in the United States to be 33.8% for those born from 1936 through 1951. In a random sample of 5,982 people born after 1951, 1,953 were found to have blue eyes. Is this evidence of a decline in the number of people with blue eyes? Show all work.

Now identify the number of blue-eyed people required in the sample size above in order to meet a 95% confidence interval. Justify your conclusion above given this interval.

2.) Determine if the below statements are TRUE or FALSE:

\_\_\_\_\_\_\_a.) Statistical hypothesis testing is a method of inferring the likelihood that the null hypothesis is not true.

\_\_\_\_\_\_\_b.) An alternative hypothesis is proven true by a rejection of the null hypothesis

\_\_\_\_\_\_\_c.) A two-sided alternative hypothesis is inappropriate when deviations from the sample distribution in both directions is impossible.

\_\_\_\_\_\_\_d.) A well stated alternative hypothesis and null hypothesis can both be true

\_\_\_\_\_\_\_e.) It is more important to ensure simple random sampling when the sample size is small

\_\_\_\_\_\_\_f.) Larger p-values indicate stronger support for the null hypothesis.

\_\_\_\_\_\_\_g.) The p-value is the probability of observing a less extreme test statistic than the one observed.

\_\_\_\_\_\_\_h.) Given a p-value of 0.02, the probability that the null hypothesis is false is 98%.

**Question 3 is Multiple Choice**

3.) The number of Americans that identify as religiously unaffiliated makes up about one fifth of the US population. A 2014 study by the Pew Research Center reported that 22.8% of the US adult population had no religious affiliation. In the American Values Atlas published by the nonprofit Public Religion Research, a survey of 5,312 San Francisco adults resulted in 24.1% unaffiliated. Is this evidence sufficient to say that San Francisco is more religiously unaffiliated than the US average?

1. P-value = 0.25 so this is not strong evidence that San Francisco is more unaffiliated
2. P-value = 0.25 so this is strong evidence that San Francisco is more unaffiliated
3. P-value is between 0.05 and 0.1 so there is moderate support of an increased percentage
4. P-value = 0.033 so there is moderate evidence of an increased percentage
5. P-value is < 0.02 so there is strong evidence of an increased percentage

4.) A significance test resulted in a p-value of 0.023. Read the following interpretation of the p-value and identify what is wrong with statement.

“Assuming the alternative hypothesis, there is a 2.3% chance of obtaining a result equal to or more extreme than what was actually observed.”