University of Texas at Austin

Problem Set # 10

Hypothesis testing. $p-$value.

Problem 10.1. The null hypothesis is a statement about the population parameter. *True or false?*

Problem 10.2. The null and alternative hypotheses are stated in terms of the statistics obtained from the random sample. *True or false?*

Complete the following statements:

Problem 10.3. When we state the alternative hypothesis to look for a difference in a parameter in any direction, we are doing a _____-sided test.

Problem 10.4. When choosing between a one-sided alternative hypothesis and a two-sided alternative hypothesis, you should base the decision on _____.

Problem 10.5. The _____ the $p-$value, the **stronger** the evidence against the null hypothesis provided by the data.

Provide your **complete solution** for the following problems.

Problem 10.6. The square footage of several thousand apartments in a new development is advertised to be 1250 square feet, on average. A tenant group thinks that the apartments are smaller than advertised. They hire an engineer to measure a sample of apartments to test their suspicions. Let μ represent the "true" mean area (in square feet) of these apartments. What are the appropriate null and alternative hypotheses?

Problem 10.7. Is the mean height for all adult American males between the ages of 18 and 21 now over 6 feet? Let μ denote the population mean height of all adult American males between the ages of 18 and 21. What are the appropriate null and alternative hypotheses?

Problem 10.8. The hypotheses are $H_0 : \mu = 10$ versus $H_a : \mu > 10$. The value of the test statistic for the population mean is $z = -2.12$. What is the corresponding $p-$value?

Problem 10.9. The value of the test statistic for a **two-sided** test for a population mean is $z = -2.12$. What is the corresponding $p-$value?