

NAME _____

MAT 130 Homework #5 (Chapters 9-10)

DUE: October 30th

#1.) Consider the following.

“Americans work at least an average of 34 years before retiring.”

State the null hypothesis, H_0 , and the alternative hypothesis, H_1 , in terms of the appropriate parameter (μ or p).

#2.) Consider the following.

“At most 5% of adults in Los Angeles ride the bus to work.”

State the null hypothesis, H_0 , and the alternative hypothesis, H_1 , in terms of the appropriate parameter (μ or p).

#3.) State the Type I and Type II errors in complete sentences given the following statements.

- a. Twenty-nine percent of high school seniors get drunk each month.
- b. Private universities cost, on average, at least \$30,000 per year for tuition.

#4.) The cost of a daily newspaper varies from city to city. However, the variation among prices remains steady with a standard deviation of 6¢. A study was done to test the claim that the average cost of a daily newspaper is 35¢. Fourteen papers costs yield an average cost of 31¢ with a sample standard deviation of 4¢. At the 1% level of significance, is there evidence to prove that the cost of a daily newspaper is different than 35¢?

Do a hypothesis test for this problem. Be sure to state the null and alternative hypothesis, compute the test statistic, find the p-value, then state your decision and conclusion in a written out statement using the words of the problems.

#5.) Toastmasters International cites a February 2001 report by Gallup Poll that 40% of Americans fear public speaking. A student believes that less than 40% of students at her school fear public speaking. She randomly surveys 361 schoolmates and finds that 137 report they fear public speaking. Conduct a hypothesis test at the 5% level to determine if the percent at her school is less than 40%.

Be sure to state the null and alternative hypothesis, compute the test statistic, find the p-value, then state your decision and conclusion in a written out statement using the words of the problems.

#6.) The mean number of sick days an employee takes per year is believed to be about 10. Members of a personnel department do not believe this figure and think it's really higher. They randomly survey 12 employees and find the following number of sick days: 13, 5, 15, 9, 16, 19, 8, 14, 4, 18, 16, 17. Let x = the number of sick days they took for the past year. Should the personnel team believe that the mean number is about 10?

Do a hypothesis test for this problem to see if the number is higher than 10. Be sure to state the null and alternative hypothesis, compute the test statistic, find the p-value, then state your decision and conclusion in a written out statement using the words of the problems. Use $\alpha = 0.05$.

#7.) A study is done to determine if students in Philadelphia public high schools do worse on the SATs, on average, than students enrolled in private high schools. Seventy five students from Philadelphia public high schools and 45 students from private high schools are surveyed. The following data are collected. The Philadelphia public high school students scored on average 1095 with a standard deviation of 95. The private high school students scored on average 1118 with a standard deviation of 115.

Do a hypothesis test for this problem to see if the Philadelphia public high school students do worse on the SATs, on average, than students enrolled in private high schools. Be sure to state the null and alternative hypothesis, compute the test statistic, find the p-value, then state your decision and conclusion in a written out statement.

#8.) The mean number of English courses taken in a two-year time period by male and female college students is believed to be about the same. An experiment is conducted and data are collected from 9 females and 14 males. The female students took 1, 2, 3, 3, 2, 4, 2, 1, and 1 English courses. The male students took 3, 1, 4, 5, 4, 4, 2, 2, 3, 3, 2, 4, 3, and 3 English courses.

Do a hypothesis test for this problem to see if the average number of English courses taken in a two-year time period by male and female college students is different. Be sure to state the null and alternative hypothesis, compute the test statistic, find the p-value, then state your decision and conclusion in a written out statement.