

Pledge:

4/10/2009
Dr. Lunsford

MATH 171
Quiz 5

Name: Solution
50 Points Possible

Please show all work on this quiz. Please be sure to show all calculator input. You will not get full credit if calculator input is not shown.

Problem I. In 1960, census results indicated that the age at which American women first married had a mean of 22.3 years. It is widely suspected that young women today are waiting longer to get married. To test this conjecture you find the average age, when they married, for a SRS of 30 young married American women is 25.3 years. Please answer the following: (8 points)

(a) State the hypotheses we would use to test this conjecture. Clearly identify the population parameter you are testing and also indicate which hypothesis is the conjecture. (6 points)

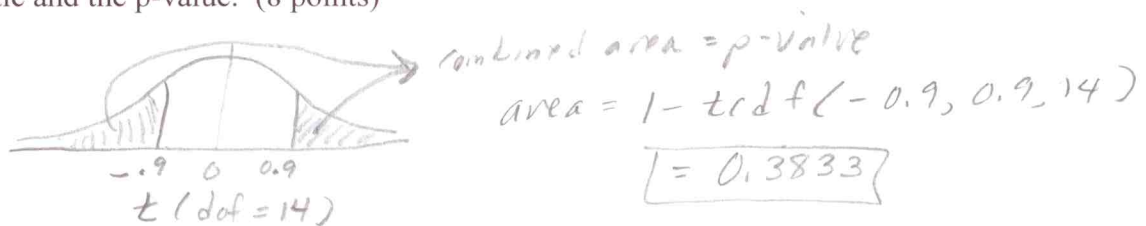
$H_0: \mu = 22.3$ years When μ is the mean age of marriage
conjecture $\rightarrow H_a: \mu > 22.3$ years for young American women.

(b) Are the data you are given in the direction of the alternative hypothesis or not? Clearly identify the data and why it is or is not in the direction of the alternative hypothesis. (2 points)

Data: $\bar{x} = 25.3$. Since $25.3 > 22.3$ then the data are in the direction of the alternative hypothesis.

Problem II. Suppose we performed a one-sample t-test with the following hypotheses: $H_0: \mu = 40$ versus $H_a: \mu \neq 40$ for an unknown population mean μ . Using a random sample of size 15, our data yield a t-test statistic of $t = -0.9$. Please answer the following: (15 points total)

(a) Find the p-value of the test and draw a picture that graphically shows **both** the test statistic and the p-value. (8 points)



(b) Is the result of this test significant at the $\alpha = 0.10$ level? What will be the conclusion of this test (in terms of the hypotheses) at the $\alpha = 0.10$ level? (5 points)

The test is not significant at the $\alpha = 0.10$ level since $p\text{-value} = 0.3833 > 0.10$. We fail to reject the null hypothesis.

(c) True or False (circle one) A 90% confidence interval for μ computed using the same random sample will contain the number 40? (2 points)

