Hypothesis Testing - mean

Name_____

**ESSAY. Write your answer in the space provided or on a separate sheet of paper.**

1) A factory manager claims that the average weekly working hours per worker is less than 40 hours. Can you conclude at 10% significance level, that the average weekly working hours exceed 40 hours using a sample of 30 workers with sample mean 46 and sample standard deviation 9?

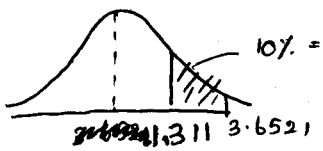
Hypothesis:

$H_0: \mu = 40$ Vs $H_a: \mu > 40$ Right tail test

Test statistic:

$$t = \frac{46-40}{9/\sqrt{30}} = \frac{6}{1.643} = 3.652.$$

Critical value and critical region:




d.f = 29

Conclusion:

Since test statistic 3.652 is in the rejection region, we reject $H_0$

We conclude at 10% significance level that mean weekly working hours exceed 40.

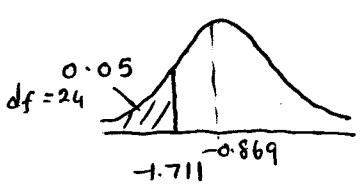
2) A jailer claims that the mean age of the prison population at a certain facility is greater than 26 years. Test the claim at 5% significance level, using a sample of 25 prisoners with sample mean age 24.4 and sample standard deviation 9.2.

Hypothesis

$H_0: \mu = 26$ Vs $H_a: \mu < 26$ left tail test

Test statistic $t = \frac{24.4-26}{9.2/\sqrt{25}} = \frac{-1.6}{1.84} = -0.869$

Critical value & region:



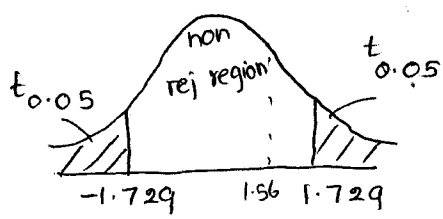

since test statistic -0.869 is in the non rejection region,

3) A researcher claims that the mean weight of a group of students is 132 LB. Can you conclude at 10% significance level, that the mean weight differes from 132 using a sample of 20 students with sample mean weight 137 LB and sample standard deviation 14.2 ?

$H_0: \mu = 132$ Vs $H_a: \mu \neq 132$ Two side

Test statistic $T = \frac{137-132}{14.2/\sqrt{20}} = \frac{5}{3.21} = 1.56$

$d.f = 19$ $\alpha = 10\%$




Since Test statistic = in non rejection region;

We fail to reject $H_0$.

We do not have enough evidence to conclude at 10% sig level, that the mean weight differs from 132.