Statistics 300
Quiz #13

Name: Solution

For hypothesis test problems, you must provide all four parts of the traditional approach.
The test statistic must show the symbolic formula and the formula with relevant values in place.

(8 points : 8 minutes)

1. A group of 25 men with the same high cholesterol level participated in a clinical test of a new medication to lower cholesterol levels in blood. Use the data below to test the claim that the new medication will decrease cholesterol by at least 10 points on average for the population of all men who have similar high cholesterol levels. (Use $\alpha = 0.05$ and assume that the distribution of decreases in cholesterol is bell-shaped.)

Claim: $\mu \geq 10$ decreases avg. at least 10

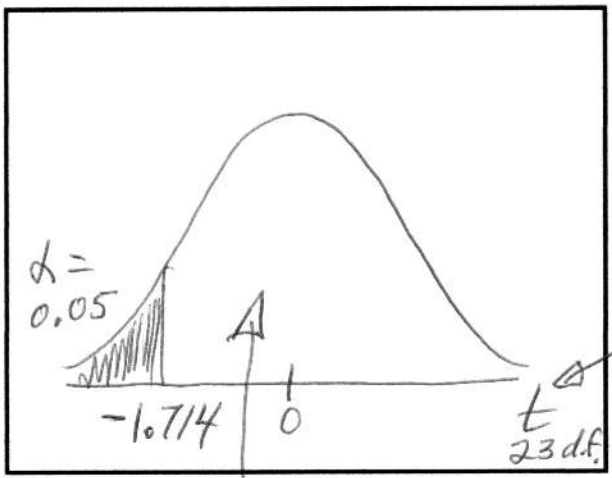
H_0: $\mu \geq 10$

H_1: $\mu < 10$

$\alpha = 0.05$ left tail

Decreases in Cholesterol
n = 24
$\bar{x}$ = 8.34
s = 12.11

d.f. = 23



because we are testing μ

test statistic

$$\frac{\bar{x} - \mu_0}{s/\sqrt{n}} = \frac{8.34 - 10}{12.11/\sqrt{24}} = \frac{-1.66}{2.472} = -0.67$$

Conclusion:
Do not reject H_0!

Statistics 300
Quiz #13

Name: Solution

(8 points : 10 minutes)

2. A manufacturing company must produce 10,000 items of the same kind so they are very similar to each other. The width of all 10,000 items must average between 1000 and 1004 with a standard deviation of 2 or less. Use the data on a sample of the first 50 items to test the production manager's claim that the goal for variability is being satisfied.
(Consider the sample to be "random" and make the significance level 0.10 for your test.)

Claim: $\sigma \le 2$

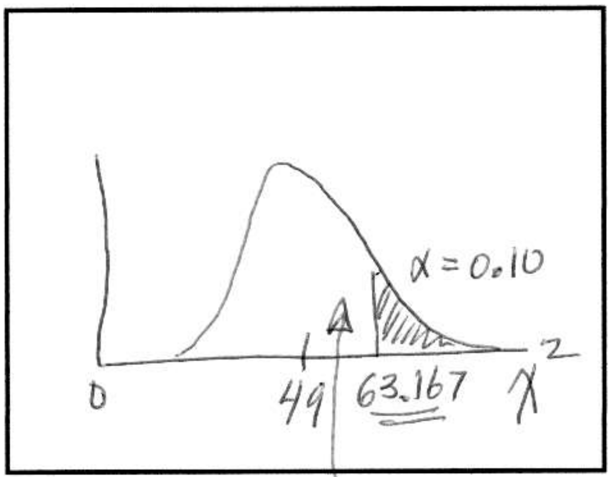
H_0: $\sigma \le 2$

H_1: $\sigma > 2$

$\alpha = 0.10$ in right tail

Data on widths
n = 50
$\bar{x}$ = **1003.4**
s = 2.12

df = 49
(use 50 in Table A.4)



Test statistic

$$\frac{(n-1)s^2}{\sigma_0^2} = \frac{(50-1)(2.12)^2}{(2)^2} = \frac{(49)(2.12)^2}{2^2} = 55.056$$

Conclusion:
Do not reject H_0!