Lab #8 – Cañada Sp. 13

Question 1: a) $H_0: \mu = 69.0$

$H_A: \mu \neq 69.0$ in.

Sample Statistics

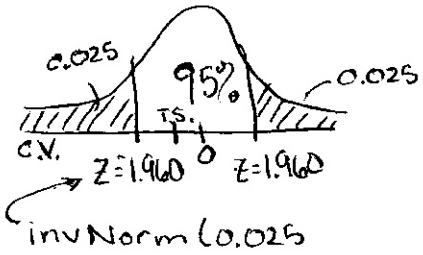
$\bar{x} = 68.88235294$

$s = 2.39484741$

$n = 17$

$X \sim N(\mu, 2.5)$ inches

b)



b) con'd T.S. $z = \dfrac{68.8824 - 69.0}{2.5/\sqrt{17}} \doteq -0.193951 \approx -0.194$

c) See part b) for T.S. on diagram

d) Fail to reject H_0 since T.S. is not in a rejection region

e) At the 90% confidence level there is not enough evidence to support the claim that the average men's height is different from Triola's claim 69.0 inches.

Question 2: a) $H_0: \mu \geq 63.6$

$H_A: \mu < 63.6$ inches

Sample Statistics

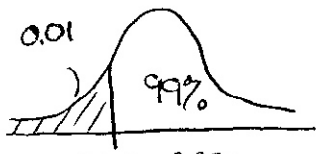
$\bar{x} = 64.3$

$s \doteq 2.711088$

$n = 15$

$X \sim N(\mu, 2.8\text{in})$

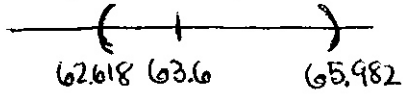
b)



b) $64.3 \pm \dfrac{2.326(2.8)}{\sqrt{15}} \Rightarrow 64.3 \pm 1.682 \Rightarrow (62.618, 65.982)$

★ *Note: If you create this interval on your calculator you must use 0.98 for confidence level! This would only be done as a check in my class!!*

c)



d) Since the confidence interval contains the mean under the null → Fail to reject H_0

e) At the 99% confidence level there isn't enough evidence to support the claim that women's heights are less than Triola's claimed 64.3 inches.

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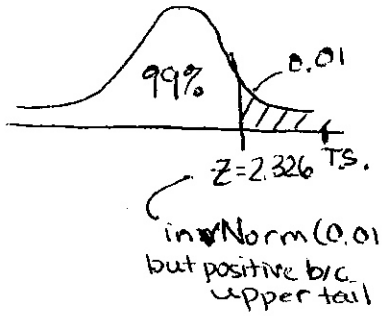
Question 3: a) $H_0: \mu_M \leq \mu_W$ b)

$H_A: \mu_M > \mu_W$



invNorm(0.01 but positive b/c upper tail

Sample statistics

$\bar{x}_M = 68.8824$ $\bar{x}_W = 64.3$

$s_M = 2.3948$ $s_W = 2.71108$

$n_M = 17$ $n_W = 15$

$X_M \sim N(\mu, 2.5)$ $X_W \sim N(\mu, 2.8)$

b) conid

$$Z = \frac{(68.8824 - 64.3) - 0}{\sqrt{\frac{2.5^2}{17} + \frac{2.8^2}{15}}} \doteq 4.856478 \approx 4.856$$

0.9435643728

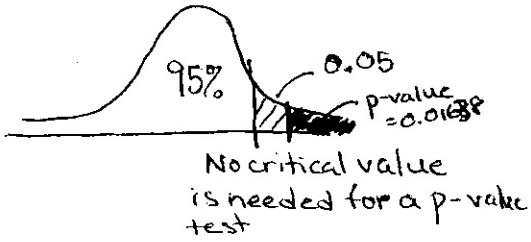
c) See T.S. on diagram in b) d) **Reject H_0 & Accept H_A**

since T.S. is in rejection region

e) At the 99% confidence level there is sufficient evidence to support the claim that men are taller than women.

Question 4: a) $H_0: p \leq 0.15$ b)

$H_A: p > 0.15$



No critical value is needed for a p-value test

Sample Statistics

$x = 239$ $\hat{q} = \frac{1164}{1403} \doteq 0.829651$

$n = 1403$

$\hat{p} = \frac{239}{1403} \doteq 0.170349$

b) conid $$Z = \frac{0.170349 - 0.15}{\sqrt{\frac{(0.15)(0.85)}{1403}}} = 2.134602$$

0.0079532468

$P(Z > 2.135) \doteq 0.01638$

normalcdf(2.135, E10

c) See area on diagram in b) d) Reject H_0 & Accept H_A b/c p-value is less than alpha

e) At the 5% significance level there is enough evidence to support the claim that more than 15% of cell phone/smart phone users access the internet on their device on a daily basis.

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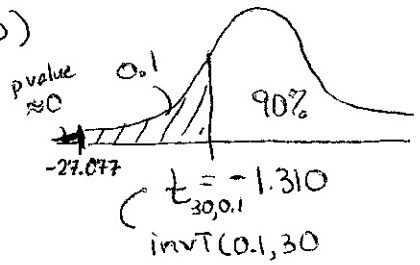
Question 5: a) $H_0: \mu \geq 0.65$

$H_A: \mu < 0.65$ ppm

b)



Sample Statistics

$\bar{x} = 0.118258$

$s = 0.109342$

$n = 31$

b) cont'd $t = \dfrac{0.118258 - 0.65}{0.109342/\sqrt{31}} = -27.07664171 \approx -27.077$

↳ in R.R. so Reject H_0 & Accept H_A

or

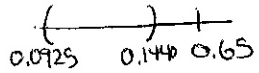
$P(t < -27.077) \doteq 0$ → $< \alpha$ so reject H_0 & Accept H_A

or ↳ tcdf(-E10, -27.077, 30)

C.I. $0.118258 \pm \dfrac{1.310(0.109342)}{\sqrt{31}} \Rightarrow 0.118258 \pm 0.0257263$

$\Rightarrow (0.0925, 0.1440)$

↳ below 0.65 so Reject H_0 & Accept H_A



c) See 3 separate explanations above

d) Reject H_0 & Accept H_A

e) At the 90% confidence level there is sufficient evidence to support the claim that the average lead in a filet is less than that of whole fish which is assumed to be 0.65 ppm.