

Key

Name:
Date:

PBHL 5013/BIOM 5013 – Collected Homework
Chapter 10

1. Answer to 10.7.

H(o): $\mu = 5$

H(a): $\mu < 5$

Test Statistic = -1.195

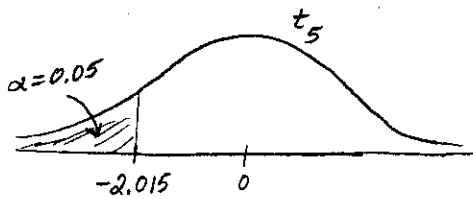
$$\bar{x} = 4.93$$

$$s = 0.13662601$$

$$n = 6$$

$$t = \frac{4.93 - 5}{\frac{0.13662601}{\sqrt{6}}} \approx -1.195$$

Sketch the rejection region. Include 'critical value(s)' from table.



$$\alpha = 0.05$$

$$df = 5$$

Decision (circle one) Reject H(o) Do Not Reject H(o)

Conclusion: There IS NOT (circle one) sufficient evidence to indicate that the dissolved oxygen content is less than 5 ppm?
mean

2. Answer to 10.8.

Find a 95% confidence interval for the mean carapace length of the *T. orientalis* lobsters. $\bar{x} = 60.8, s = 7.969385868, n = 10, \alpha = 0.05, \frac{\alpha}{2} = 0.025, df = 9$

$$\frac{60.8}{\text{pt. estimate.}} \pm \frac{2.262}{\text{table value}} \frac{7.969385868}{\sqrt{10}} \text{ standard error of pt. est.}$$

$$\left(\frac{55.10}{\text{lower value}}, \frac{66.50}{\text{upper value}} \right)$$

3. Answer to 10.25. $1 \Rightarrow$ Light Tuna in Water
 $2 \Rightarrow$ Light Tuna in Oil

a. $H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

Test Statistic = -1.16

Decision (circle one) Reject H_0 **Do Not Reject H_0** (The p-value is greater than α .
 $(0.260 > 0.05)$)

Conclusion: There **IS NOT** (circle one) sufficient evidence to indicate that μ_1 differs from μ_2 ?

b. Find a 95% Confidence Interval for $\mu_1 - \mu_2$.

-0.250844 ± 2.069
 pt. estimate. table value

from the MINITAB output in the book

$(-0.700004, 0.198316)$
 lower value upper value

$0.290887391 \left(\frac{1}{14} + \frac{1}{11} \right)$
 standard error of pt. est.
 Aside: $S_p^2 = \frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}$
 $= \frac{(4-1)(0.400)^2 + (11-1)(0.679)^2}{14+11-2}$
 $S_p^2 = 0.290887391$

Does your interval estimate substantiate your conclusion in part a? Explain.

Yes, it does because the 95% confidence interval contains the value "0."

4. Answer to 10.37.

a. $H_0: \mu_d = 0$

$H_a: \mu_d \neq 0$

Test Statistic = 1.177

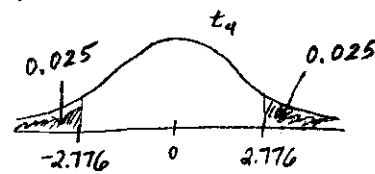
	Pairs				
Population	1	2	3	4	5
1	1.3	1.6	1.1	1.4	1.7
2	1.2	1.5	1.1	1.2	1.8
d	0.1	0.1	0	0.2	-0.1

$\bar{x}_d = 0.06, s_d = 0.114017543, n_d = 5$

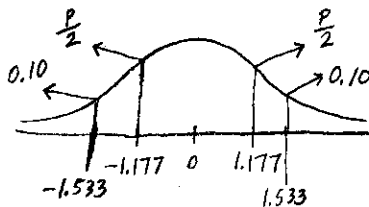
$t = \frac{0.06}{\frac{0.114017543}{\sqrt{5}}} \approx 1.177$

Decision (circle one) Reject H_0 **Do Not Reject H_0**

Conclusion: There **IS NOT** (circle one) sufficient evidence to indicate that μ_1 differs from μ_2 ?



b. P-value ≥ 0.20



$\frac{\text{p-value}}{2} > 0.10$
 $\text{p-value} > 0.20$

Interpretation: There is more than a 20% chance that the researcher is wrong if he/she says that the two population means are different.

c. Find a 95% Confidence Interval for μ_d .

$$\frac{0.06}{\text{pt. estimate.}} \pm \frac{2.776}{\text{table value}} \frac{\frac{0.114017543}{\sqrt{5}}}{\text{standard error of pt. est.}}$$

$$\left(\frac{-0.082}{\text{lower value}}, \frac{0.202}{\text{upper value}} \right)$$

d. I am 95% confident that the difference between the two population means is between -0.082 and 0.202.
