Math 373 Hw 22 Name _____ Score _____/ 30

Hw 373: 10.3', 10.5, 10.7. 382:18 Rec 373: 10.3, 10.5. 382:17

Page 373. *As before, write acceptance and confidence intervals in both forms:*

$\bar{x} \in 10 \pm (1.96)(.5) = [9.02, 10.98]$

or $\bar{x} \le 10 + (1.645)(.5) = 10.82$

10.3′(4). Find the approximating interval for the *p*-value of each *t* and given number *df* of degrees of freedom.

Reminder: left endpoints must be ≤ right endpoints.

(a) Two-tailed test, $t = 2.43$, 10 *df*.

(. _ _ , . _ _) 7

(b) Right-tailed test, $t = 3.21$, 10 *df*.

(0, . _ _ _) 5

(c) Two-tailed test, $t = -1.8$, 20 *df*.

(. _ _ , . _) 6

(d) Left-tailed test, $t = -3.0$, 5 *df*.

(. _ _ , . _ _ _) 8

10.5(8, answer in back). A 10-element sample from a normal population consists of the data:

{7.4, 7.1, 6.5, 7.5, 7.6, 6.3, 6.9, 7.7, 6.5, 7.0}

(a) Find the mean $\bar{x}$, sample std. dev. *s*, and SE.

$\bar{x} =$ _ . _ _ 12

$s =$. _ _ _ _ 26

SE = . _ _ _ _ 22

(b) Find the 99% confidence interval (two-tailed).

df = Hint: $df \neq 10$. $t_{\alpha/2} =$ _ . _ _ 10

Interval = _ . _ _ ± (_ . _ _)(. _ _ _ _)

= [_ . _ _ , _ . _ _] 15, 18

(c) For the hypotheses $H_0: \mu \ge 7.5$, $H_a: \mu < 7.5$, and $\alpha = 1\%$, find the (one-tailed) acceptance region for $\bar{x}$.

Write the region in both forms; write endpoint to 4 decimal places.

$\bar{x} \in$ = 21

(d) Should you reject $H_0: \mu \ge 7.5$? Why?

(d′) Should you reject $H_0: \mu = 7.5$? Why?

10.7(8). Water must have a dissolved oxygen level of at least 5 parts per million to support aquatic life. Six samples from a river gave the following dataset: {4.9, 5.1, 4.9, 5.0, 5.0, 4.7}. Let $\alpha = 1\%$.

(a) Find the mean $\bar{x}$, sample std. dev. *s*, and SE.

$\bar{x} =$ _ . _ _ _ _ 22

$s =$. _ _ _ _ 16

SE = . _ _ _ _ 18

(b) State the null and alternate hypotheses.

H_a: H_0: Null region

(c) Find the acceptance region (1%) for $\bar{x}$. Write both forms.

13

(d) Find the corresponding (one-tailed, in the opposite direction, around the sample mean) confidence bound interval for μ.

8

(e) Find *t*. __ __.__ __ 3 or 11

(f) Find the the acceptance region for *t*. 17

Page 382.

10.18(10). A researcher wishes to prove that poodles (P) are more obedient than terriers (T). He administers a 15 point obedience test to 4 terriers which get scores of {12, 3, 8, 5} and 5 poodles which get scores of {14, 7, 7, 9, 6}. The significance level is 10%.

(a) Calculate $\bar{x}_P$, $\bar{x}_T$, s_P, s_T and the pooled std. dev. *s*.

$x_P =$ _ . _ , $s_P =$ _ . _ _ , $\bar{x}_T =$ _ , $s_T =$ _ . _ _

s = _ . _ _ *SE* = _ . _ _ 11,12

df = _ $t_\alpha =$ _ . _ _ _

(b) Find the confidence interval for $\mu_P - \mu_T$. 13

3-place negative endpoint.

(c) Find the acceptance region for $\bar{x}_P - \bar{x}_T$. 11

3-place positive endpoint.