

Statistics

Lecture 24



Feb 19-8:47 AM

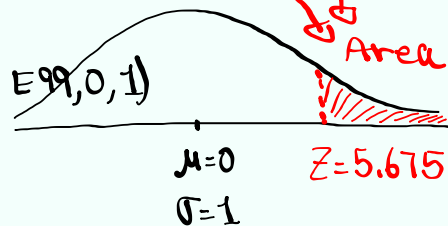
CTS $Z = 5.675$ RTT

SG 23

Find corresponding P-Value.

$$P\text{-Value} = \text{normalcdf}(5.675, E99, 0, 1)$$

$$= 6.954 \times 10^{-9}$$



If it was TTT

$$P\text{-Value} = 2 \cdot \text{normalcdf}(5.675, E99, 0, 1)$$

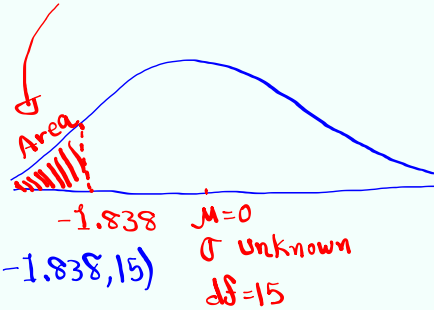
☒ 2 ☐ Enter

$$1.391 \times 10^{-8}$$

Nov 26-10:37 AM

CTS $t = -1.838$ LTT $df = 15$.

Find corresponding P-Value.



$$P\text{-Value} = \text{tcdf}(-E99, -1.838, 15)$$

$$= \boxed{.043}$$

If it was TTT

$$P\text{-Value} = 2 \cdot \text{tcdf}(-E99, -1.838, 15)$$

$$\boxed{X} \ 2 \ \boxed{\text{Enter}} = \boxed{.086}$$

Nov 26-10:43 AM

College claims that 65% of all students are in favor of online classes. $\rightarrow P = .65$
 $\uparrow H_0$

$x = n\hat{p} = 225(.62) = 139.5$ $\boxed{x=140}$
 if decimal $\rightarrow$ Round up $n=225$

I randomly selected 225 students and 62% of them were in favor of online classes.
 $\hat{p} = .62$
 use $\alpha = .01$ to test the claim.

$H_0: p = .65$ claim
 $H_1: p \neq .65$ TTT

CV Z TTT $\alpha = .01$

H_1 CR .005
 H_0 NCR .99
 H_1 CR .005

CTS $Z = -.874$
 P-Value $P = .382$ ✓

1-Prop ZTest
 $P_0: .65$ H_0
 $x = 140$
 $n = 225$
 Prop $\neq P_0$ H_1
 $\boxed{\text{Calculate}}$

CV $Z = \text{invNorm}(.995, 0, 1)$

CTS is in NCR
 P-Value $> \alpha$
 H_0 valid H_1 invalid
 Valid claim
 FTR the claim

Nov 26-10:48 AM

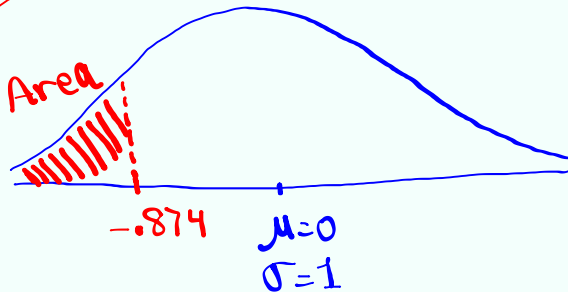
Doing Reverse

CTS $Z = -.874$

TTT

Find p-Value.

2 • Area



$$P\text{-Value} = 2 \cdot \text{normalcdf}(-E99, -.874, 0, 1)$$

$$= .382$$

Nov 26-11:05 AM

Testing Population Mean μ :

Given: $H_0: \mu = 84$, Claim is H_0 , $\alpha = .1$
 $n = 32$, $\bar{x} = 90$, $\sigma = 10$

Test the claim.

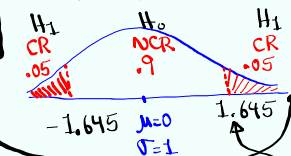
 $H_0: \mu = 84$ claim $H_1: \mu \neq 84$ TTT

CTS $Z = 3.394$
 P-Value $P = 6.9 \times 10^{-4}$

Z-Test

mp: $\mu_0 = 84$ H_0
 $\sigma = 10$
 $\bar{x} = 90$
 $n = 32$
 $\mu \neq \mu_0$ H_1

Calculate

 σ is KnownCV Z TTT $\alpha = .1$ CV $Z = \text{invNorm}(.95, 0, 1)$

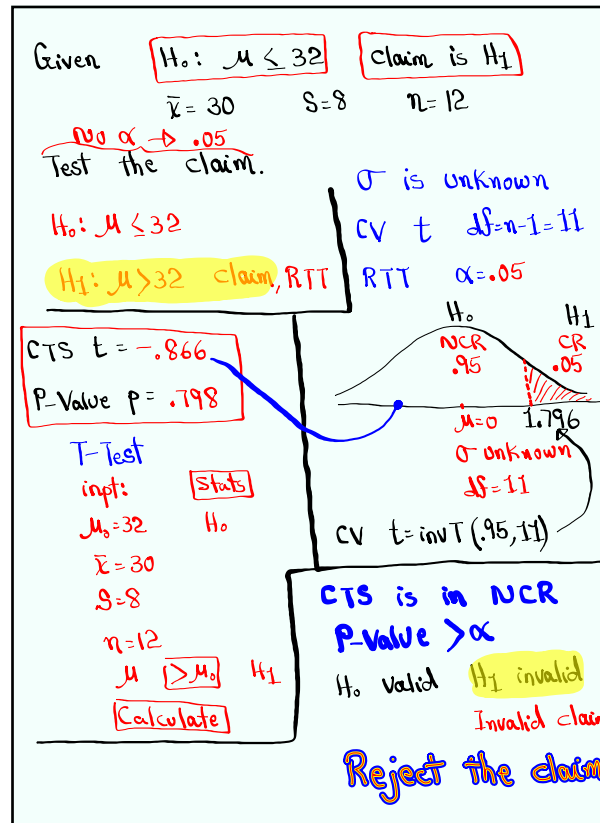
CTS is in CR

P-value $\leq \alpha$ H_0 invalid H_1 Valid

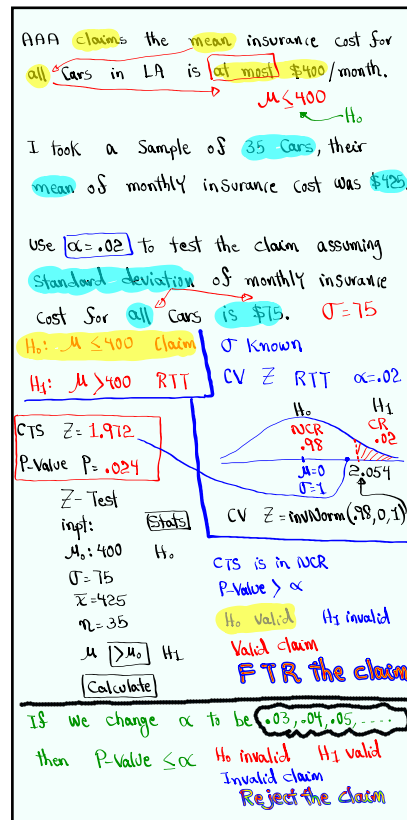
Invalid claim

Reject the claim

Nov 26-11:08 AM



Nov 26-11:23 AM



Nov 26-11:36 AM

The math department claims the mean of all math exams is 84. $\mu = 84$
 H_0

I took a sample of 20 math exams,
 their mean was 80 with standard
deviation of 7. $n=20, \bar{x}=80, S=7$
 σ unknown $\rightarrow$ Case II

No $\alpha \rightarrow .05$
Test the claim

$H_0: \mu = 84$ claim
 $H_1: \mu \neq 84$ TTT

CV t TTT $\alpha = .05$
 $df = n - 1 = 19$

CTS $t = -2.556$
 P-value $P = .019$

T-Test
 inpt: Stats
 $\mu_0: 84$ H_0
 $\bar{x} = 80$
 $S = 7$
 $n = 20$
 $\mu \neq \mu_0$ H_1
 Calculate

CV $t = \text{invT}(.975, 19)$

CTS is in CR
 P-value $< \alpha$
 H_0 invalid H_1 valid
 Invalid claim
Reject the claim

If we choose $\alpha = .01 \rightarrow$ P-value $> \alpha$
 H_0 valid, H_1 invalid
FTR the claim $\leftarrow$ Valid claim

Nov 26-11:56 AM

I randomly Selected 10 students. Here are
 their ages:

24	18	20	30	32
20	19	25	25	30

Find
 $\bar{x} = 24$
 $S = 5$ } Round to whole #
 $\bar{x} = 24.3, S = 5.056$

College claims the mean age of all students
is 25. $\mu = 25$
 σ unknown $\rightarrow$ Case II
Test the claim

$H_0: \mu = 25$ claim
 $H_1: \mu \neq 25$ TTT

CV t TTT $\alpha = .05$
 $df = n - 1 = 10 - 1 = 9$

CTS $t = -.632$
 P-value $P = .543$

T-Test
 inpt: Stats
 $\mu_0 = 25$ H_0
 $\bar{x} = 24$
 $S = 5$
 $n = 10$
 $\mu \neq \mu_0$ H_1
 Calculate

CV $t = \text{invT}(.975, 9)$

CTS is in NCR
 P-value $> \alpha$
 H_0 valid H_1 invalid
 Valid claim
FTR the claim

SG 23, 24, and 25.
Learn how to use the testing chart

Nov 26-12:14 PM