(8)

$H_0 : \mu \geq 0.20$

$H_A : \mu < 0.20$

One tailed test (left tailed)

$n =$

σ = population std. = ~~cm~~

Qualifies for T-test.

Significance level :- $(\alpha) = 1\%$ = ~~0.01~~

$\alpha = 0.01$

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Decision Rule:-

→ Critical value:-

t_c = critical value
t_s = Statical test value.

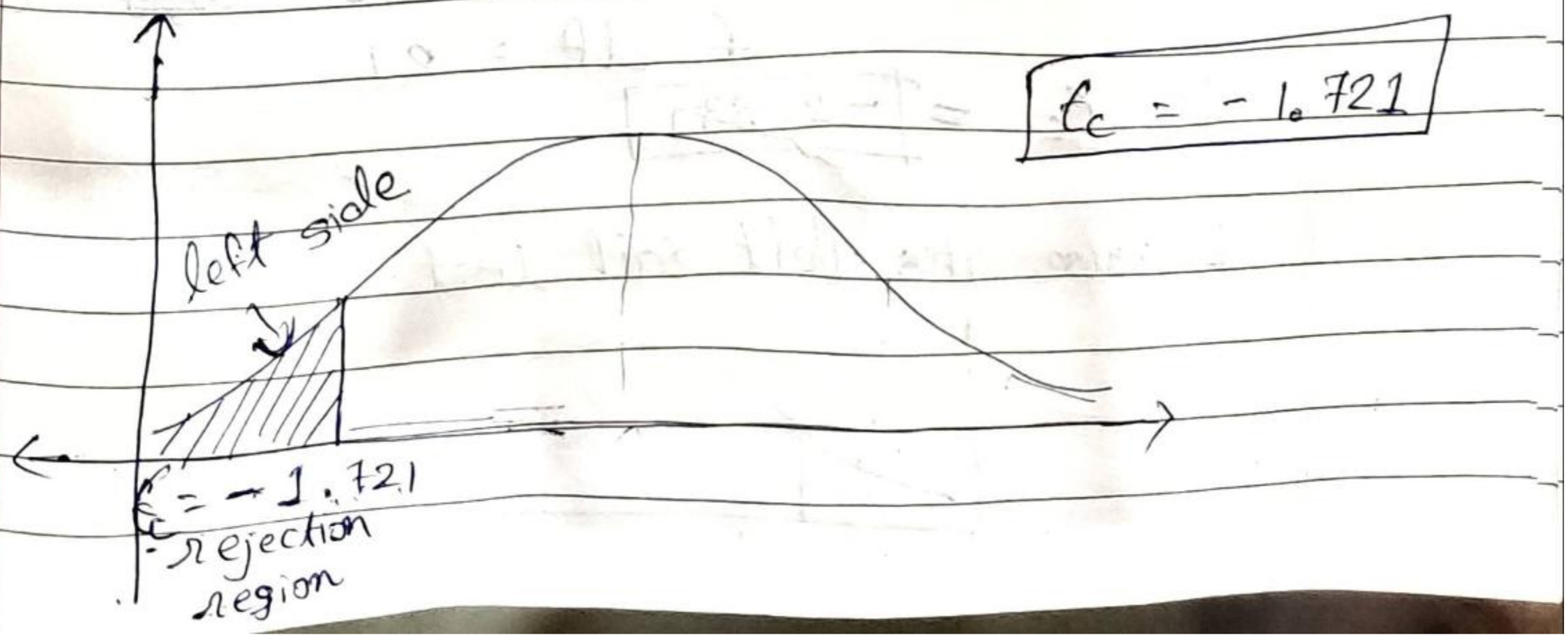
$t_s > t_c$, then null hypothesis will be reject.
→ H-L will hold correct.

& P-value:-
p-value < α, will reject null hypothesis.

☆ t-critical :- [help of the t-table]

α = ~~0.01~~ 0.10
df = (n-1) = (22-1) = 21

t_c = 1.721 → [so, here looked in to t-table, one-tail test
α = 0.01 & in colum
df 21 result will be 1.72]



$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

$$t_s = \frac{-0.20}{\frac{7}{\sqrt{22}}}$$

$$= -0.13$$

→ Conclusion:-

$t_s \not< t_c$

$t_s = -0.13$

$t_c = -1.721$

$-0.13 \not< -1.721$

$|t_s| < |t_c|$

So, we will accept the ~~null~~ hypothesis when significance level is ~~0.01~~ 0.10 or 10%

* if significance level $\alpha = \frac{1\%}{100\%} = \frac{0.01}{0.10}$

$\alpha = 0.01$

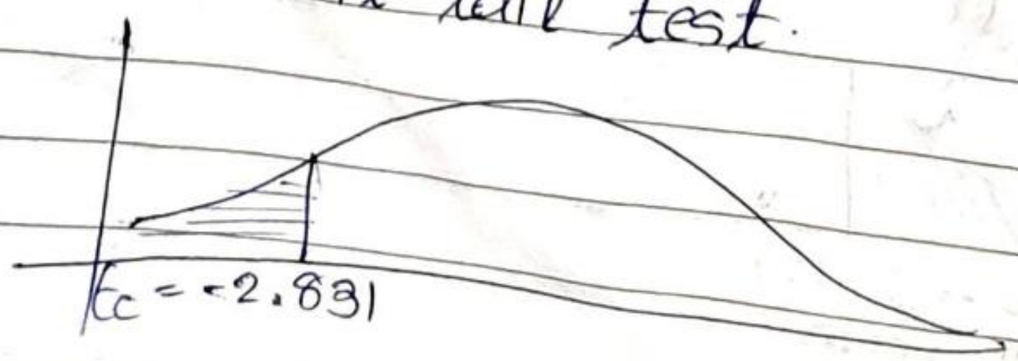
$df = (n-1) = (22-1) = 21$

$t_c = (?)$

Checked in t-table: $\alpha = 0.01$ & $df = 21$

So, $t_c = \boxed{-2.831}$

because it's left tail test.



$t_s = -0.13$

$t_c = -2.831$

$t_s < t_c$

$-0.13 < -2.831$

$|t_s| < |t_c|$

So, as per signification level 1% or 0.01 we will be accept the null hypothises.

* Dicision :-

Here we can say that 20% of the entire fleet might be out of compliance.

* if signification level $\alpha = 5\% = 0.05$

$df = 21$

$t_c = -2.080$

$t_s = -0.13$

$t_s < t_c$

$-0.13 < -2.080$

as per significant level 5%, we will be accept the null hypothesis.

So, 20% of the entire fleet might be out of compliance

* p-value :-

p-value = 0.4489 = 0.45

★ P- Value:-
if p-value < α : will be reject the null hypothesis.

→ When $\alpha = 0.01$ (1%)
p-value = 0.55
p-value > α

So, we will be accept the null hypothesis

→ ~~When $\alpha = 0.05$~~ $p' > \alpha$
~~p-value =~~ $0.55 > 0.05$

$0.55 > 0.10$

→ When $\alpha = 0.05$ (5%)
p-value > α
0.55 > 0.05

Will accept the null hypothesis

→ When $\alpha = 0.10$ (10%)
p-value > α
0.55 > 0.10

Will accept the null hypothesis

★ Conclusion:-
There is not enough evidence to reject H-0 means null Hypothesis at the significance level 0.05 or 0.01 or 0.10, because p-value is greater than 0.05 or 0.01 or 0.10.