

T-stats \div J test \rightarrow One Sample t-test.

- ① In the population the average IQ is 100. A team of researchers want to test a new medication to see if it has either a positive or negative effect on intelligence, or no effect at all. A sample of 30 participants who have taken the medication has a mean of 140 with a standard deviation of 20. Did the medication affect intelligence? C.I. = 95%

Ans) $\mu = 100$ $n = 30$ $\bar{x} = 140$ $\sigma = 20$ (C.I. = 0.95)
 $\alpha = 0.05$

① Null Hypothesis $H_0: \mu = 100$

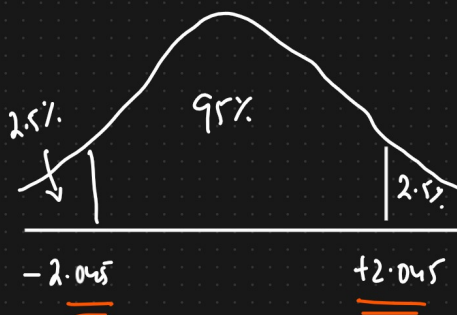
Alternate " $H_1: \mu \neq 100$ {2 Tail Test}

② $\alpha = 0.05$

③ Degree of freedom

$$df = n - 1 = 30 - 1 = \underline{\underline{29}}$$

④ Decision Rule



If t test is less than -2.045 and greater than 2.045 , Reject the Null Hypothesis

⑤ Calculate t test statistics

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{140 - 100}{20/\sqrt{30}} = \frac{40}{3.65} = 10.96$$

⑥ Conclusion

Decision Rule: If t is less than -2.0452 and greater than 2.0452 , reject the Null Hypothesis

$$t = 10.96 > 2.0452 \Rightarrow \text{Rejecting the Null Hypothesis}$$

Answer

Conclusion: Medication has increased the Intelligence.