

T-stats

÷ T test

→ One Sample t-test

- Q 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% $\alpha = 0.05$

Ans) $M = 100$ $n = 30$ $\bar{x} = 140$ $s = 20$ C.I = 95% $\alpha = 0.05$

Deviation of 20. Did the medication affect intelligence? C.I = 95% $\alpha = 0.05$

Ans) $\mu = 100$ $n = 30$ $\bar{x} = 140$ $s = 20$ C.I = 95% $\alpha = 0.05$

① Null Hypothesis $H_0 \vdash \mu = 100$

Alternate hypothesis $H_1 \vdash \mu \neq 100$ {2 tail test}

② $\alpha = 0.05$

③ Degree of freedom



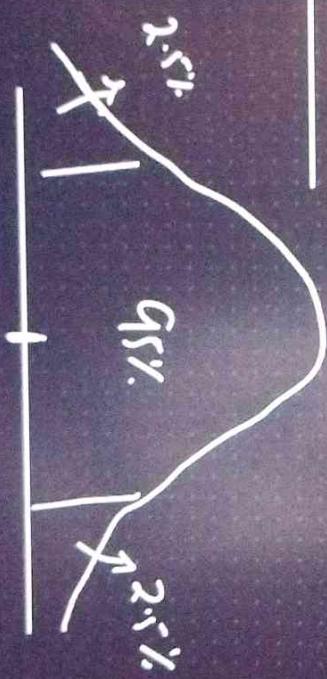
Altman Hypothesis H_1 : $\mu \neq 100$ {2 tail test}

② $\alpha = 0.05$

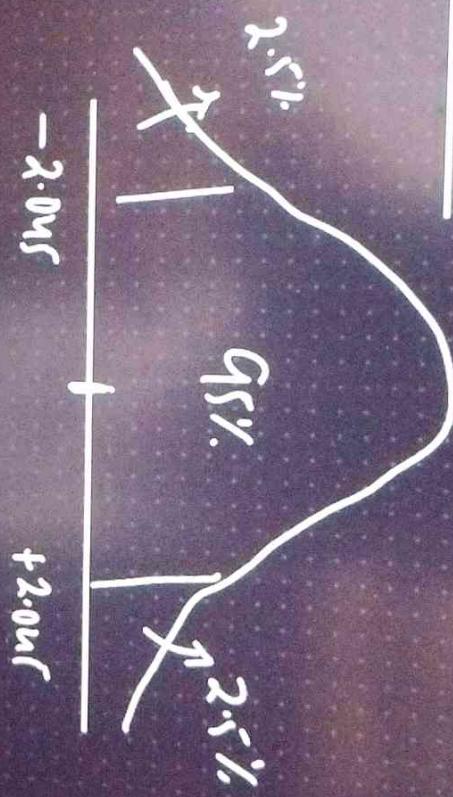
③ Degrees of freedom

$$dof = n - 1 = 30 - 1 = 29.$$

④ Decision Rule



④ Decision Rule



If t_{test} is less than -2.045 or greater than 2.045 , reject the null hypothesis.

⑤ Calculate Test Statistic

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

$$t = 10.96$$

t

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$t = 10.96 > 2.045$ Reject the Null Hypothesis.

Conclusion : Medication used has affected the Intelligence

Medication has increased the Intelligence

