

HYPOTHESIS TESTS FOR SMALL SAMPLES

Z or t? (For means)

* If $n > 30$ use Z

* If $n < 30$ and normally distributed population use t

* If σ is known, use Z

* If σ is unknown and normally distributed population, use t

Example: claim $\mu > 10$

$n = 20 \rightarrow$ use t
 $\bar{x} = 11.5$
 $s = 2.7$

$H_0: \mu = 10$
 $H_a: \mu > 10$

(Step 1)

(Step 2) test statistic

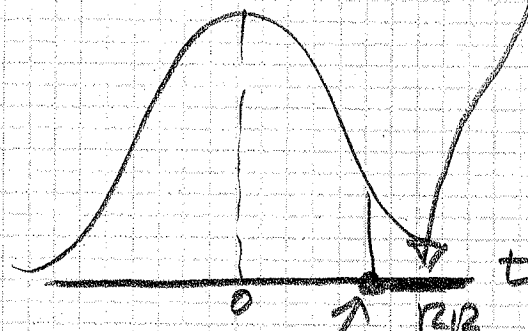
$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}} = \frac{11.5 - 10}{\frac{2.7}{\sqrt{20}}} = 2.48$$

(Step 3) Rejection Region

$\alpha = 0.05$

$df = n - 1 = 20 - 1 = 19$

RR: $t > 1.729$



Critical Value
 = 1.729

Step 4 Decision

Reject H_0 , because $t = 2.48 > 1.729$

Step 5 Conclusion

"The data provide sufficient evidence to conclude, at $\alpha = .05$, that the population mean is greater than 10"