8-5

Mean σ unknown

n sample size

$\bar{x}$ sample mean

$\mu_{\bar{x}}$ population mean from sample means

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

s sample standard deviation

p439

6 known or unknown

normally distributed

$n > 30$

6. Neither

8. Normal

15. p440

$n = 25$

$df = 24$ $\quad n-1$

$\bar{x} = 13.2$

$s = 3.7$

$\alpha = .05$

$H_0 : \mu = 21.1$

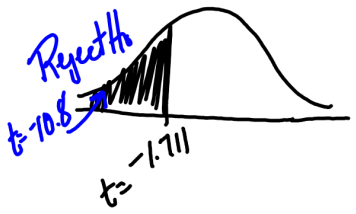
$H_1 : \mu < 21.1$

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

$$t = \frac{13.2 - 21.1}{\frac{3.7}{\sqrt{25}}}$$

$t = -10.8$

.05 in one tail <



The sample data support the claim that filtered cigarettes have a mean tar amount less than 21.1 mg. The filters are effective.

17.

$\bar{x} = 2.49910\,g$

$\mu_{\bar{x}} = 2.5$

$n = 37$

$df = 36$

$s = .01648$

$\alpha = .05$

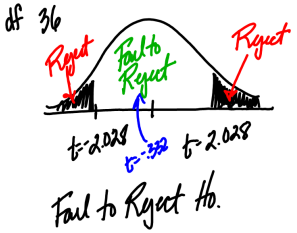
two-tailed $\frac{\alpha}{2} = .025$

$H_0: \mu = 2.5$

$H_1: \mu \neq 2.5$

$$t = \frac{2.4991 - 2.5}{\frac{.01648}{\sqrt{37}}}$$

$t = -0.332$



Fail to Reject H_0.

There is not sufficient evidence to warrant rejection of the claim that pennies have a mean weight of 2.5.
The pennies meet the specifications of the U.S. Mint.

p-value
use calculator

Stat
→ Tests
2 T-test
Stats
Enter values
↓
Calculate

p - value
Test against α