

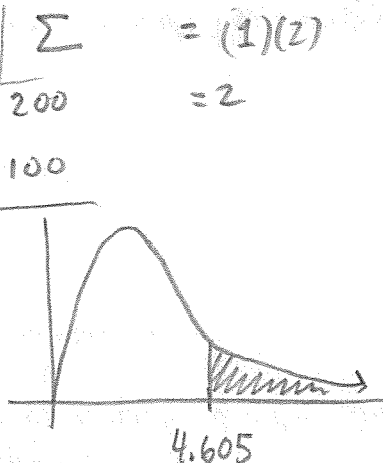
§10.2 | #16

H_0 : result independent of treatment
 claim $\rightarrow H_a$: not that

$\alpha = 0.1$
 $r = 2$ $c = 3$
 $d.f. = (r-1)(c-1)$

here:

| | Acet. | Ibu. | Cod. | Σ |
|-------------------|-------|------|------|----------|
| big improvement | 58 | 81 | 61 | 200 |
| small improvement | 42 | 19 | 39 | 100 |
| Σ | 100 | 100 | 100 | |



Expected freqs

$E_{1,1} = \frac{(100)(100)}{300} = 33.33... = E_{1,2} = E_{1,3}$

$E_{2,1} = E_{2,2} = E_{2,3} = 33.33...$

Test stat

$\chi^2 = \frac{(58 - 33.33)^2}{33.33} + \dots = 118.7631$ (ALL COMBOS)

We reject H_0 , meaning there is evidence to support the claim.

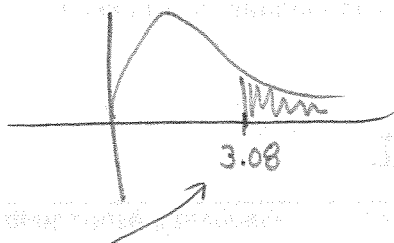
§10.3 | #20

claim $\rightarrow H_0: \sigma_1^2 \geq \sigma_2^2$
 $H_a: \sigma_1^2 < \sigma_2^2$

Competitor
 $n_1 = 21$
 $s_1^2 = 0.45$
 $d.f._N = 20$

Manufacturers
 $n_2 = 19$
 $s_2^2 = 0.21$
 $d.f._D = 18$

$\alpha = 0.01$



$F = \frac{s_1^2}{s_2^2} = \frac{0.45}{0.21} = 2.14$

Fail to reject H_0 , meaning there is not evidence to support the claim.

not in table, used a calculator

§10.4

$\alpha = 0.01, k = \# \text{ samples} = 3$

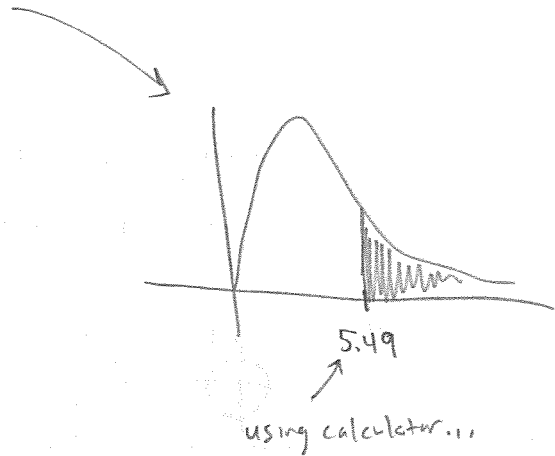
$N = \text{sum of sample sizes} = 30$

(2)

$d.f._N = k - 1 = 2$

$d.f._D = N - k = 27$

$H_0: \mu_1 = \mu_2 = \mu_3$
 claim $\rightarrow H_a$: at least one different



Data table from Excel

| Anova: Single Factor | | | | | | |
|----------------------|----------|-------|----------|----------|----------|----------|
| SUMMARY | | | | | | |
| Groups | Count | Sum | Average | Variance | | |
| Column 1 | 10 | 730.6 | 73.06 | 93.75822 | | |
| Column 2 | 10 | 508.2 | 50.82 | 56.99511 | | |
| Column 3 | 10 | 439.7 | 43.97 | 62.40678 | | |
| ANOVA | | | | | | |
| Source of Variation | SS | df | MS | F | P-value | F crit |
| Between Groups | 4625.894 | 2 | 2312.947 | 32.55225 | 6.39E-08 | 3.354131 |
| Within Groups | 1918.441 | 27 | 71.05337 | | | |
| Total | 6544.335 | 29 | | | | |

Since $F = 32.55$, we reject H_0 meaning there is evidence to support the claim.