I TWO POPULATIONS VARIANCES TEST (σ_1^2 AND σ_2^2)

EXAMPLE 5-11 P264 $s_1 = 5.1$, $s_2 = 4$, $n_1 = 11$, $n_2 = 16$, $\alpha = 0.1$

TESTING FOR EQUALITY OF THE TWO POP. VARIANCES, SAME, DIFFER-2 SIDED TEST

$s_1 = 5.1$, $s_2 = 4$

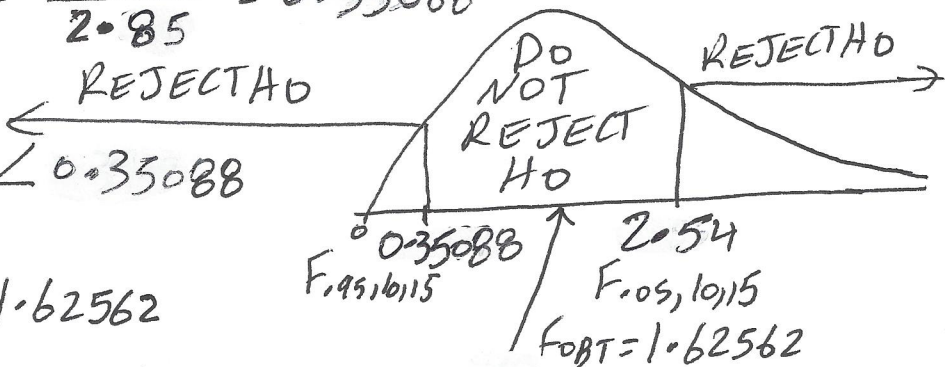
① $H_0: \sigma_1^2 = \sigma_2^2$
$H_1: \sigma_1^2 \neq \sigma_2^2$

② IF $F_{OBT} > F_{\alpha/2, n_1-1, n_2-1}$ OR $F_{OBT} < F_{1-\alpha/2, n_1-1, n_2-1}$ REJECT H_0

$\alpha = .1$, $\alpha/2 = .05$, $n_1 - 1 = 11 - 1 = 10$, $n_2 - 1 = 16 - 1 = 15$, $f_{.05,10,15} = 2.54$ (U, V)

$$f_{0.95,10,15} = \frac{1}{F_{.05,15,10}} = \frac{1}{2.85} = 0.35088$$ (U, V)

IF $F_{OBT} > 2.54$ OR $F_{OBT} < 0.35088$ REJECT H_0



③ $F_{OBT} = \frac{s_1^2}{s_2^2} = \frac{(5.1)^2}{(4)^2} = 1.62562$

④ AS $1.62562 < 2.54$ OR $1.62562 > 0.35088$ DO NOT REJECT H_0

⑤ WE ARE 90% CONFIDENCE THAT THE VARIANCE OF THE SURFACE ROUGHNESS OF ALL TITANIUM ALLOY COMPONENTS USING GRINDING PROCESS 1 IS NOT DIFFERENT THAN THE VARIANCE OF SURFACE ROUGHNESS OF ALL TITANIUM ALLOY COMPONENTS USING GRINDING PROCESS 2.

USING THE CONFIDENCE INTERVAL

2A IF 1 IS INSIDE THE CI DO NOT REJECT H_0

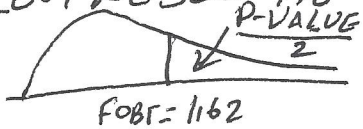
3A USING EQUATION 5-22 $0.46 \leq \frac{\sigma_1^2}{\sigma_2^2} \leq 3.36$ PAGE 264

4A AS 1 IS INSIDE CI, DO NOT REJECT H_0

USING THE P-VALUE

2B IF P-VALUE $< \alpha$ REJECT H_0, IF P-VALUE < 0.1 REJECT H_0

3B $F_{OBT} = 1.63$ USING TABLES IV $U = 10$, $V = 15$



AT $\alpha = 0.25$, $F_{.25,10,15} = 1.45$, $\alpha = .1$, $F_{.1,10,15} = 2.06$

$1.45 < F_{OBT} = 1.63 < 2.06$, $\therefore 0.1 < \frac{\text{P-VALUE}}{2} < 0.25$ AND $0.2 < \text{P-VALUE} < 0.5$ ASSUME 0.4

4B AS $0.4 > 0.1$ AND P-VALUE $>$, DO NOT REJECT H_0