

d) Find a 95% Confidence interval for $\frac{\sigma_T^2}{(\sigma_T^2 + \sigma^2)}$

$$\frac{L}{1+L} \leq \frac{\sigma_T^2}{\sigma_T^2 + \sigma^2} \leq \frac{U}{1+U}$$

$$L = \frac{1}{n} \left(\frac{MS_{Treat}}{MS_E} \left(\frac{1}{F_{0.025, 4, 21}} \right) - 1 \right), \quad U = \frac{1}{n} \left(\frac{MS_{Treat}}{MS_E} \left(\frac{1}{F_{0.975, 4, 21}} \right) - 1 \right)$$

$$L = \frac{1}{5} \left(17.5 \left(\frac{1}{0.1170} \right) - 1 \right); \quad U = \frac{1}{5} \left(17.5 \left(\frac{1}{3.48} \right) - 1 \right)$$

$$\begin{aligned} L &= \frac{1}{5} (149.5726 - 1); & &= \frac{1}{5} (5.028736 - 1) \\ &= \frac{1}{5} (148.5726) & &= \frac{1}{5} (4.028736) \\ &= 29.71452 & &= 0.80575 \end{aligned}$$

$$\frac{29.71452}{1+29.71452} \leq \frac{\sigma_T^2}{\sigma_T^2 + \sigma^2} \leq \frac{0.80575}{1+0.80575}$$

$$0.9674421 \leq \frac{\sigma_T^2}{\sigma_T^2 + \sigma^2} \leq 0.4462135$$

$$0.4462135 \leq \frac{\sigma_T^2}{\sigma_T^2 + \sigma^2} \leq 0.9674421$$