lcavol, lpsa, lcp, cbind(age, lbph)

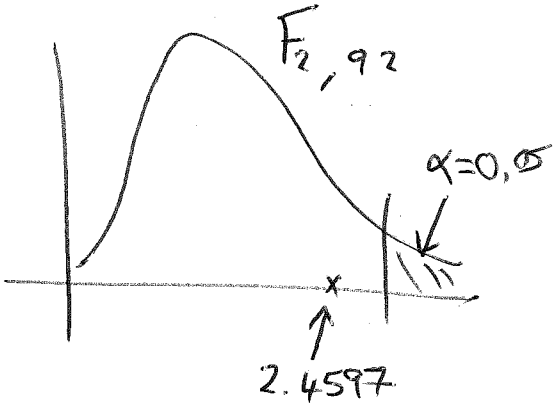
$$Y = \underbrace{\beta_0 + \beta_1 X_1 + \beta_2 X_2}_{\text{nested in}} + \underbrace{\beta_3 X_3 + \beta_4 X_4}_{} + \varepsilon$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

$\varepsilon \sim N(0, \sigma^2)$

$$H_0 : \frac{\sigma^2_{additions}}{\sigma^2_{error}} = 1$$

$$H_A : \frac{\sigma^2_{additions}}{\sigma^2_{error}} > 1$$



equivalent to

H_0: $\beta_3 = \beta_4 = 0$

H_A: not both $\beta_3, \beta_4 = 0$

OR at least one of $\beta_3, \beta_4 \neq 0$