

QUIZ 6 BUM2413, APPLIED STATISTICS, SEM II 2013/2014

MATRIC NO.: 1803006

SECTION: 11

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Question 1 (3 points)

In the past, the standard deviation of diameter for a certain tyre model is 2.07 inch. A random sample of ten tyres showed a standard deviation of 2.93 inch. Find the 95% confidence interval for the variance of the diameter of all tyres. Given that, $\chi^2_{0.025,9} = 19.0228$ and $\chi^2_{0.975,9} = 2.7004$.

$n = 10$ $s = 2.93$

$\chi^2_{0.025,9} = 19.0228$

$\chi^2_{0.975,9} = 2.7004$

A 95% CI for population variance

$$\left(\frac{(10-1)(2.93)^2}{19.0228}, \frac{(10-1)(2.93)^2}{2.7004} \right)$$

~~$= (4.0617, 28.6121)$~~

Question 2 (7 points)

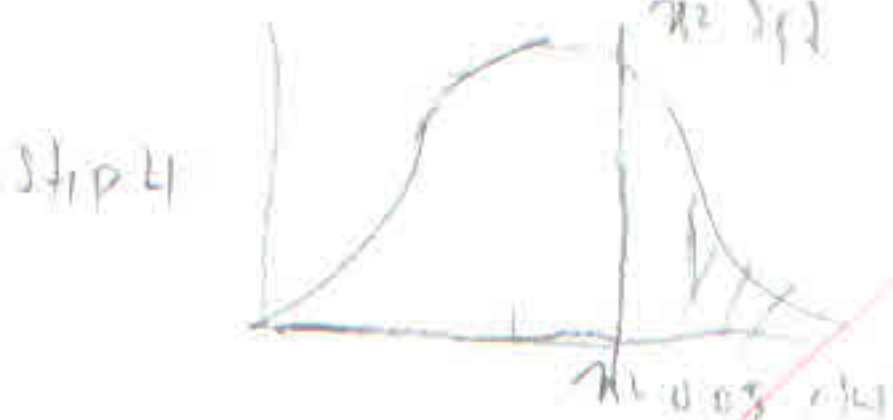
A sporting goods manufacturer claims that the variance of the strength of a certain fishing line is at least 15.9. A random sample of 15 fishing line spools has a variance of 21.8. At $\alpha = 0.05$, is there enough evidence to reject the manufacturer's claim? Assume the population is normally distributed.

$n = 15$ $s^2 = 21.8$

Step 1: $H_0: \sigma^2 \leq 15.9$
 $H_1: \sigma^2 > 15.9$

Step 2: $\chi^2_{stat} = \frac{(15-1)(21.8)}{15.9} = 19.1950$

Step 3: $\alpha = 0.05$ $\chi^2_{0.05,14} = 23.6848$



$\chi^2_{0.05,14} = 23.6848$

$\chi^2_{stat} > \chi^2_{0.05,14}$ \therefore decision: reject H_0

Step 5: Therefore, there is ^{no} enough evidence to reject the manufacturer's claim at $\alpha = 0.05$