

THE CHI-SQUARED DISTRIBUTION: PRACTICE 3; TEST OF A SINGLE VARIANCE

STUDENT LEARNING OUTCOMES:

- THE STUDENT WILL EXPLORE THE PROPERTIES OF DATA WITH A TEST OF A SINGLE VARIANCE

GIVEN:

Suppose an airline claims that its flights are consistently on time with an average delay of at most 15 minutes. It claims that the average delay is so consistent that the variance is no more than 150 minutes. Doubting the consistency part of the claim, a disgruntled traveler calculates the delays for his next 25 flights. The average delay for those 25 flights is 22 minutes with a standard deviation of 15 minutes.

SIMPLE VARIANCE

1. Is the traveler disputing the claim about the average or about the variance?
2. A sample standard deviation of 15 minutes is the same as a sample variance of _____ minutes.
3. Is this a right-tailed, left-tailed, or two-tailed test? _____

HYPOTHESIS TEST

Perform a hypothesis test on the consistency part of the claim.

4. H_0 :
5. H_a :
6. Degrees of freedom =
7. χ^2 test statistic =
8. p-value =

9. Graph. Label and scale the horizontal axis. Shade in the region of the p-value.



Let $\alpha = 0.05$

Decision:

Conclusion (write out in a complete sentence):

DISCUSSION QUESTIONS

11. How did you know to test the variance instead of the mean?
12. If an additional test were done on the claim of the **average** delay, which distribution would you use?
13. If an additional test was done on the claim of the average delay, but 45 flights were surveyed, which distribution would you use?