

Worksheet: Where is the flat tire?

The Scene: As an old story goes, four students purposely miss an exam on Monday because they need an extra day to study. They email the professor Monday morning explaining that they were away for the weekend and got a flat tire on their way back to campus. Could they please take a make-up exam Tuesday?

The professor agreed, and the students stayed after class on Tuesday to take the exam. The first page had a few simple questions worth 10 points. The second page had a single question worth 90 points: “Which tire was flat?”

The Question: If asked to guess which tire on a car has gone flat, which tire would you choose, Front Left, Front Right, Back Left, or Back Right? Circle your choice below:

FL FR

BL BR

The Research Question : It has been suggested that, if asked to guess which tire on a car has gone flat, people will choose the front right tire most often.

1. What is the parameter of interest in the research question?
2. If the four tires were, in fact, equally likely to be chosen, what proportion of times would the front right tire be selected in the long run?
3. Use your answer to the previous question, and the framing of the research question to specify the null and alternative hypotheses of a test of significance to test the research question.
4. Carry out the test of significance at the 5% significance level using the class data for tire choices as our sample. Restate your hypotheses, compute the test statistic, and find the p-value using technology. Then write a few sentences summarizing and explaining your conclusion about whether your sample data provide strong evidence that people tend to pick the “right front” tire more than a fourth of the time in the long run.