

MA331 Quiz 02 Section ____ Name_____

A company is doing market research on a new product and have selected a random sample of potential customers to help choose the most effective TV commercial.

- Out of the 180 people in the sample 65 viewed the 1st version, 30 viewed the 2nd version, and the others viewed the 3rd.
- Of those who viewed the 1st version, 25 indicated that they were likely to buy the product while the rest said they were either unsure or unlikely to buy the product.
- For those viewing the 2nd version, 18 said they were likely to buy it, and for the 3rd version 54 said the same.

Printout necessary formulae, keep numerical results with 2 decimals and report p-values by using expression.

Problem 1. Identify the two concerned categorical random variables and printout their possible outcomes. (10pts)

Problem 2. Produce the observed two way table. (10pts)

Problem 3. Construct the expected two way table based on the above observed table. Showing the details of calculating the expected cell counts. (15pts)

Problem 4. Evaluate the observed χ^2 based on the above two tables. (15pts)

Problem 5. (i) Printout the null and alternative hypotheses. (5pts)

(ii) Determine the null distribution of the testing statistic. (10pts)

Problem 6. Express and then calculate the p-value of the observed χ^2 by using the null distribution. (15pts)

Problem 7. For a significance level $\alpha \in (0, 1)$, how do you draw a conclusion? (10pts)

Problem 8. How do you interpret your conclusion in this real context? (10pts)