

Each problem is worth 10 points. Open book and notes.

Questions 1 to 5 refer to this scenario: An ESP experiment is done in which a participant guesses which of 4 cards the researcher has randomly picked, where each card is equally likely. This is repeated for 220 trials and the participant guesses correctly 72 times. The null hypothesis is that the subject is guessing, while the alternative is that the subject has ESP and can guess at higher than the chance rate.

1. State the null and alternative hypotheses in symbols.
2. Calculate the value of the test statistic.
3. Find the p-value for the test. Draw a sketch of the appropriate distribution showing this value.
4. Make a conclusion and state it in the context of the problem.
5. Explain what a Type 1 error would be in this situation.

