

STAT 216 - Worksheet #9 **Section:** _____ **Names:** _____

A common test for extra-sensory perception (ESP) asks a subject to identify which of four shapes (star, circle, wave, or square) appears on a card unseen by the subject. If a person does not have ESP and is just guessing, she/he should therefore get 25% correct in the long run. In other words, the proportion of correct responses that the guessing subject would give in the long run would be 0.25. Suppose that each person being tested is shown a random sample of $n = 5$ cards.

1. When an individual is tested, define in symbols and words the parameter of interest.

2. In how many possible ways can a subject get *exactly* 2 cards correct? List the ways in which this can happen.

3. True or False: These _____ ways are disjoint outcomes.

4. Noting your answers to parts (a) and (b), find the probability that a subject gets exactly 2 cards correct if she/he is just guessing .

5. Find the probability that a guessing subject does not get any cards correct, and then fill in all probabilities in the table below for the probability distribution of $X =$ the number of correctly identified cards.

# Correct Cards	0	1	2	3	4	5
Probability		0.3955			0.0146	0.0010

6. Assuming a subject is just guessing, what is the expected value for the number of correct cards (out of 5)? Does this value make sense?

7. Suppose you test someone for ESP and they correctly identify 4 out of 5 cards correctly. Would you say this is a *statistically significant* result? Support your conclusion with a probability.