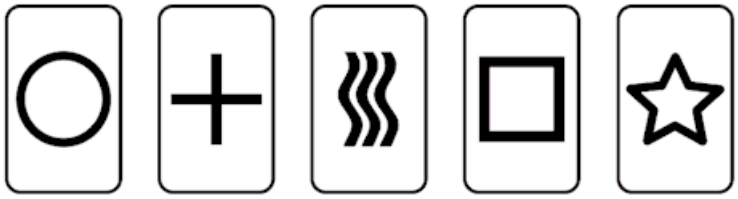
Psychic Testing **Math 121 - Workshop**

You might not know this about me, but I am psychic, at least according to a test of psychic abilities that I took when I was 14. Here's how the test works. You need two people and a collection of Zenner cards:



One person acts as a tester. They randomly select one of the five Zenner cards and look at it without showing it to the person being tested (the subject). The subject has to use their psychic powers to try to read the tester's mind and figure out what card they are looking at. Together the tester and the subject repeat the process 25 times and record the number of guesses that the subject got correct.

1. If a subject has no psychic powers and is just guessing, what percent of the time would they get the right answer on average?

2. There are two possible hypotheses in this situation. Either the subject is psychic or they are just guessing. Which of these two hypotheses is the null hypothesis? How would you write these two hypotheses if you used the symbol p to represent the true probability that the subject will get the right answer?

3. Why does it make sense to do a 1-sided alternative hypotheses here?

4. When, I took the test, I got 10 out of 25 correct. So my sample proportion was $\hat{p} = \frac{10}{25} = 40\%$. Use the formula $z = \dfrac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$ to find the z-value and then use the normal distribution app to find the corresponding p-value. Was my performance on the test statistically significant evidence that I am psychic? How significant is the evidence?