On page 24 of Mazur, exercise 1.2.18 asks students to count the number of 5-card hands in poker for various special types of poker hands. Your task is to write up solutions to these problems as if you are a teacher who is explaining them to your students. That means that you have to help your students understand. For example, you would say,

> Because there are four suits in a deck of cards, you first choose one of them. There are $\binom{4}{1} = 4$ ways to do this.

Note that the actual answers can all be found by googling (e.g. Wikipedia has a table of the answers). That means that the what you are really being assessed for on this assignment is the explanations that you give.

For each of the 10 types of hand, compute the number of those hands and the probability or odds of getting that hand. For example, the number of royal flushes is 4, while the total number of 5-card hands is $\binom{52}{5} = 2,598,956$. That means that the probability of getting a royal flush is $\frac{4}{2598956} = 0.000154\%$ and the odds of getting a straight flush are $\frac{2598956}{4} = 649,739$ to 1.

To get a score of "E", also do some research into video poker machines. Based on the odds you've computed, do they usually offer the chance of a winning strategy? Or are you likely to lose money overall?

Rubric:

- To meet expectations (M) on this assignment, the assignment should

  - Be mostly mathematically correct, with perhaps just a minor arithmetic error.
  - Contain accurate explanations, with no conceptual errors shown.
  - Give complete explanations, not missing important information.

- To exceed expectations (E) on this assignment, the assignment should be

  - Be completely mathematically correct.
  - Contain explanations that are accurate, complete, well-written, and helpful.
  - Written using complete sentences, punctuation, etc.
  - Have a discussion of video poker machines and an analysis of their payouts compared to the odds. Be sure to include a Works Cited if you do this. Any style of Works Cited is okay, as long as you are consistent.