

Homework Problems
Due Wednesday, September 10, 2008

Problem 1 Assume you have six wooden squares with the letters G, Z, S, Y, Y, Y stamped on them. Assume all $6!$ orderings of the letters are equally likely. What is the probability that a letter arrangement spells $SYZGY$?

Problem 2 An bowl contains 3 red marbles and 8 green marbles. A random sample of 4 of the marbles is take from the bowl. What is the probability that the sample contains exactly 2 red marbles and 2 green marbles.

Problem 3 If it is assumed that all $\binom{52}{5}$ poker hands are equally likely, what is the probability of being dealt a full house? (This occurs when the cards have denominations a, a, a, b, b where a and b are distinct, e.g., $7, 7, 7, 4, 4$.)

Problem 4 Three cards are randomly selected, without replacement, from an ordinary deck of 52 playing cards. Compute the probability that the three cards selected are clubs.

Problem 5 Let X denote a random variable that takes on the values 0, 1, 2 with respective probabilities

$$P(X = 0) = 0.4 \quad P(X = 1) = 0.3 \quad P(X = 2) = 0.3.$$

Compute $E(X^2)$.

Problem 6 An instructor gives a class a set of 10 problems with the information that the final exam will consist of a random selection of 5 of them. If a student in the class has figured out how to do 6 of the problems, what is the probability that the student will answer all 10 of the final-exam problems correctly?

Problem 7 When coin A is flipped it comes up heads with probability $\frac{1}{3}$. When coin B is flipped it comes up heads with probability $\frac{1}{2}$. Suppose one of the coins is randomly chosen and is flipped twice. If both flips land heads, what is the probability that coin A was flipped.