

LECTURE 2. INTRODUCTION TO PROBABILITY

Problem 1. A, B and C fight a three-cornered duel. A's chance to hit a target is .3, C's is .5 and B never misses. They are to fire at their choice of target in succession in the order ABC but a hit man loses further turns and is no longer shot at. A is first up. What is his best strategy?

Problem 2. There are three ants at the three corners of a triangle. Each ant starts moving in a straight line toward another, randomly chosen corner. What is the probability that none of the ants collide?

Problem 3. *The Three Door Problem.* In a quiz show, there are three closed doors. Behind one of the doors is a shiny new automobile; behind each of the other two is a bag of peanuts. The MC asks a contestant to pick one of the doors and win whatever is behind it. After the contestant has indicated the door he wants, the MC (who knows where the car is) opens one of the other two doors and reveals a bag of peanuts. He then turns (with a malicious grin) to the contestant and asks if he would now like to switch his original choice to the other (unopened) door. Should he switch? What would you do?

Problem 4. An urn contains 10 balls; 6 red and 4 black, well mixed together. You pick a ball and note its color but do NOT replace the ball. Mix well and now pick a second ball. (a) What is the probability that the first pick is red? (b) What is the probability that the second pick is red?

TOPICS

- A. Some history: Cardano (1501-1576), Fermat (1601-1665), and Pascal (1623-1662)
- B. Sample spaces. Problems 2 and 3.
- C. Conditional probability. Problem 4.