Math 201

Spring 2022

Worksheet 2

1. Suppose an urn contains 3 black chips, 2 red chips and 2 green chips. We draw 3 chips at random without replacement. Let A be the event that all three chips are of different color.

   (a) What is the probability space Ω you are working with? (There is more than one way to describe Ω.)

   (b) Compute $P(A)$ by imagining that the chips are drawn one by one as an ordered sample.

   (c) Compute $P(A)$ by imagining that the 3 chips are drawn all at once as an unordered sample.

2. The orange line bus arrives to the station every 15 minutes starting from 5:00pm. Fred arrives to the station in a time which is distributed uniformly between 5:00pm and 5:45pm. Fred got out from a recitation and missed the 5:00pm bus. What is the probability that he will wait less than 5 minutes at the station?

3. Mary and Jonny are playing paintball on opposite teams and they try to shoot each other simultaneously.

   - The probability that both May and Jonny hit the target in a single shot is 1/8.
   - The probability that May hits the target but Jonny misses the target is 3/8.
   - The probability that May misses the target but Jonny hits the target is 1/8.
   - The probability that both May and Jonny miss the target is 3/8.

   The game ends when one of the two players hits the other. If the two players hit each other at the same time they both lose.

   (a) What is the probability that the battle will end on the n-th round (with the n-th shot of May or Jonny)?

   (b) What is the probability that May wins the game?

   (c) What is the probability that Jonny wins the game?

4. At a certain school, 25% of the students wear a watch and 30% wear a bracelet. 60% of the students wear neither a watch nor a bracelet.

   (a) One of the students is chosen at random. What is the probability that this student is wearing a watch or a bracelet?

   (b) What is the probability that this student is wearing both a watch and a bracelet?