

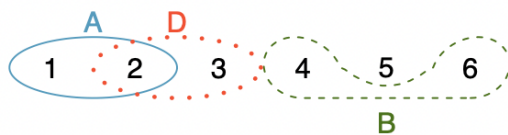
Probability

Practice problems

9/23/24

Please work on the practice problems in your group. At least one of the following problems will be assigned to the weekly problem set.

1. If events A and B are disjoint:
 - a. What must $P(A \cap B)$ equal, and why?
 - b. What is a simple formula for $P(A \cup B)$?
2. In a multiple choice exam, there are 5 questions and 4 choices for each question. Nancy has not studied for the exam at all and decides to randomly guess the answers. What is the probability that:
 - a. the first question Nancy gets correct is the 5th question?
 - b. Nancy gets all of the questions right?
 - c. Nancy gets at least one question right?
3. In the following figure, the sample space is the set of outcomes $S = \{1, 2, 3, 4, 5, 6\}$. We define three different events A , B and D as denoted by the color and circling.



- a. Which pairs of events are disjoint?
- b. Suppose we have a random process whose sample space is S as defined above. Also suppose that $P(1) = 0.1$, where the notation $P(1)$ stands for probability of observing a 1 from the random process. Also suppose that $P(A) = 0.3$. $P(B) = 0.2$. Based on this information, create a table that represents a valid probability distribution for this random process.