Combinatorics: The Fine Art of Counting

Sample Problems – Week 6

Take a few minutes to think about at these problems and if you think you know how to solve any of them, please do so now.

Sample Problem 1: A six-sided die is rolled six times. What is the probability of rolling at least one six?

Sample Problem 2: Three (not necessarily distinct) integers from the set {1,2,…,10} are chosen at random. What is the probability the product of the three integers is even? What if the integers are distinct?

Sample Problem 3: Two balls are drawn from an urn containing five black balls and five white balls. What is the probability the balls are different colors?

Sample Problem 4 Balls are drawn from an urn containing six black and five white balls until the last black ball is drawn. What is the probability the urn is empty?

Sample Problem 5 Two cards are drawn from a standard deck of 52 cards. What is the probability that the first card is the ace of diamonds and the second card is a spade?

Sample Problem 5: There are three two-sided cards. One card has both sides red, another has both sides blue, and the third has one side red and one side blue. You are shown one side of a card selected at random and it is red. What is the probability the other side is also red?