

Homework 2 in Discrete Probability Theory

Variant 1

Exercise 1

Urn A contains 3 red and 3 black balls, whereas urn B contains 4 red and 6 black balls. If a ball is randomly selected from each urn, what is the probability that the balls will be the same color?

Exercise 2

From a group of 3 freshmen, 4 sophomores, 4 juniors, and 3 seniors a committee of size 4 is randomly selected. Find the probability that the committee will consist of

(a) 1 from each class;

Exercise 3

Show that if $P(A_i) = 1$ for all $i \geq 1$, then

$$P\left(\bigcap_{i=1}^{\infty} A_i\right) = 1.$$

Exercise 4

Four red, 8 blue, and 5 green balls are randomly arranged in a line.

(a) What is the probability that the first 5 balls are blue?

