Each question gives you maximum 1 point. You need to earn at least 4 points to be allowed to present the exam.

1. In a box there are 11 white balls and 16 black. 4 balls are chosen randomly from among them without return. What is the probability that, among the chosen balls **a)** there is at least 1 black ball. **b)** there are exactly 2 black balls

2. The probability theory exam consists of 50 questions, each written on a separate sheet of paper. Exactly 6 of these questions are considered easy. Students enter the examination room one at a time. Each student randomly selects one sheet and keeps the corresponding question. John decides in advance to be the third student to enter the room, so when it is his turn, 48 questions remain. What is the probability that John selects an easy question?

3. There are 10 cards in a box, labeled with numbers $1, 2, \ldots, 10$. A card is drawn at random from the box, and it is immediately returned to the box. We repeat this procedure 20 times. Find the approximate value of the probability that the card with the number 2 will appear exactly 4 times.

4. The PMFs of the independent random variables X and Y are given in the following tables:

k	1	2	3
$\mathsf{P}(X = k)$	0,5	0,2	0,3

k	0	1	2
$\mathsf{P}(Y = k)$	0,2	0,3	0,5

   (a) Find the PMF of the random variable $Z = \max\{X, Y\}$.

5. The joint PMF of (ξ, η) is given by the following table:

$\xi \setminus \eta$	-1	0	1
-2	1/5	1/10	1/5
2	1/10	1/5	1/5

   Compute $\mathsf{Cov}(3\xi - \eta + 1, \xi)$.

6. A regular six-sided die with numbered faces is rolled until all the faces are rolled up. Find the expected value and variance of the number of tosses.