Probability Calculus 2021/2022, Homework 3 (two problems)

Name and Surname .... Student's number ....

In the problems below, please use the following: as k – the sum of digits in your student's number; as m – the sum of the two largest digits in your student's number; and as n – the smallest digit in your student's number plus 1. For example, if an index number is 609999: $k = 42$, $m = 18$, $n = 1$.
Please write down the solutions (transformations, substitutions etc.), and additionally provide the final answer in the space specified (the answer should be a number in decimal notation, rounded to four digits).

5. There are k workers in a certain company, out of which m are vaccinated against COVID-19, while $k - m$ are not. A nurse was hired in this company. Each day, after coming to work, the nurse invites a randomly selected employee of the company for a medical checkup. If the employee isn't vaccinated yet, the nurse administers a shot. Let X denote the number of the working day when the nurse invites a vaccinated employee for the first time. Calculate $\mathbb{P}(X \geq 3)$.

ANSWER:

Solution:

6. Let X be a random variable from a uniform distribution over $[-n, k]$. Calculate $\mathbb{P}(n < X < m)$.

ANSWER:

Solution: