Probability Calculus 2018/2019, Homework 4 (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).

9. We toss a coin, which has a probability of heads appearing equal to m/k**, until we toss two heads consecutively or until we get two tails consecutively. Let** X **denote the number of tosses. Calculate** $\mathbb{P}\left(X \geq \frac{2n-1}{4} + 5\right)$**.**

ANSWER:

Solution:

10. Let X be a random variable from an exponential distribution with parameter n. Calculate

$$\mathbb{P}\left(0 \leq \ln(X^k) - \frac{k}{m} < 2\right).$$

ANSWER:

Solution: