

Mathematical Statistics 2017/2018, Homework 6 (One problem)

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 largest digit in your student's number; and as  $n$  – the smallest digit in your student's number plus 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).*

7. The amount of time it takes a student to solve a homework problem in mathematical statistics (in minutes) follows a normal distribution with unknown mean  $\mu$  and a variance equal to  $m^2$ . We want to verify the null hypothesis that  $\mu = k$  against the alternative that  $\mu = 2k$  on the base of a single observation  $X$  using the following procedure: if  $X > c$ , we reject the null. Find  $c$  such that the test has a significance level of  $n\%$ . Calculate the probability of committing an error of the second type for this test.

ANSWER:

|                |                             |
|----------------|-----------------------------|
| value of $c$ : | prob. of second type error: |
|----------------|-----------------------------|

Solution: