

## Mathematical Statistics 2018/2019, Homework 10

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).*

10. The price levels of coffee (in crowns) were studied in four summer resorts. Basic characteristics for the collected data are summarized in the table below:

sample stats \ city	A	B	C	D
average price (in crowns, per coffee)	$k + m$	$k$	$k + n$	$k + 1$
variance of price (unbiased estimator)	$k^2 + mn + 10$	$k^2 + mn + 10$	$k^2 + mn + 15$	$k^2 + mn + 15$
sample size	$5m$	$40n - k$	$k$	$5m$

Assuming that the prices in different cities are independent and follow normal distributions with unknown means and a common variance, verify the hypothesis that the average coffee price levels in the four cities are equal, for a significance level  $\alpha = 0.01$ .

ANSWER:

Critical value for the test:	Value of test statistic:	Reject null? (YES/NO):
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Solution: