

Mathematical Statistics 2020/2021, 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).

7. A group of $3m$ students were asked about the amount of time they spend on social media activities. In the studied group, the average weekly time devoted to these activities was equal to k hours, with a standard deviation (calculated on the base of the unbiased estimator of the variance) of $2n$ hours. Assuming that the time spent on social media activities follows a normal distribution, find the 95% confidence interval for the mean time. How many more students should be included in the sample, in order to obtain a 95% confidence interval with width not exceeding 1?

ANSWER:

CI:	additional number of students:
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Solution:

8. A teacher wants to determine the fraction of students who like Mathematical Statistics the most from all subjects taught at their faculty. How many students should be interrogated, in order to obtain a $(100 - n)\%$ confidence interval of width not exceeding $\frac{1}{m}$, if we know that the studied fraction does not exceed $\frac{2n}{k}$? Let us assume that in a sample of $10k$ students, there were $10n$ who confirmed liking this subject most. Calculate a $(100 - n)\%$ confidence interval for the studied fraction, based on this sample.

ANSWER:

number of students:	CI:
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Solution: