N.I. Lobachevsky State University
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Probability theory and mathematical statistics:

Probability distributions — Practice

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Problem. Let random variable X have probability distribution given in the following table:

-2	-1	0	1	2
0.2	$?$	0.3	0.1	0.1

Compute $\mathrm{P}(X \leqslant 0)$, $\mathrm{P}(|X| \geqslant 2)$.

Problem. Let random variable X have a uniform distribution on the set $\{-n, -n+1, \ldots, n\}$. Find probability distribution of random variables $X + n$ and X^2.

Problem. Let random variable X have geometric probability distribution. Prove that $\mathrm{P}(X = 2) \leqslant \frac{1}{4}$.

Problem. Automatic production line makes defective article with probability 0.001. After each defective article the production line is due to readjustment. What is the probability that there are 1000 articles between two readjustments? What is the probability thatat least 1000 articles will be sequentially produced without defects?