Student: _____

Group: _____

Lecturer: A.S. Eremenko

**HOMEWORK 4**

1. Physical probabilities also called:

| 1 | |
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a) Bayesian probabilities;

b) objective probabilities;

c) frequency probabilities;

d) evidential probabilities.

2. Evidential probabilities also called:

| 1 | |
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a) Bayesian probabilities;

b) objective probabilities;

c) frequency probabilities;

d) evidential probabilities.

3. The key concept of the axiomatic approach is:

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a) probability;

b) frequency of occurence;

c) assignment of probability;

d) random experiment.

4. Probability Axioms are:

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a) non-negativity;

b) normalization;

c) impossibility;

d) additivity.

5. If a random experiment can result in $N$ mutually exclusive and equally likely outcomes and if $N_A$ of these outcomes result in the occurrence of the event $A$, the probability of $A$ is defined by $P(A) = \frac{N_A}{N}$. This is:

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a) the classical definition of probability;

b) the frequency probability;

c) the statistical probability;

d) the empirical probability.

6. What is the ratio of the number of favorable outcomes to the total number of trials, not in a sample space but in an actual sequence of experiments:

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a) classical probability;

b) relative frequency;

c) experimental probability;

d) empirical probability?

7. Geometric probability is:

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a) $P(A) = \frac{N_A}{N}$;

b) $probability = \frac{number\ \ of\ favorable\ \ outcomes}{number\ \ of\ possible\ \ outcomes}$;

c) $probability = \frac{area\ \ of\ favorable\ \ region}{area\ \ of\ total\ \ region}$;

d) $P(A) = \lim_{n_t \to \infty} \frac{N_A}{N_t}$?

**Problem 1**. Subscriber, when he was dialing the number, forgot three last digits and dialed it at random kept in his mind that those digits are different. Find the probability that dialed digits were correct.

*Solution*:

| 4 | |
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**Problem 2**. Find the probability that randomly dropped point into the square will be in the inscribed into this square circle.

*Solution*:

| 4 | |
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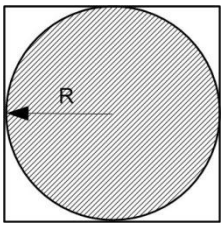


**Fig. 1**

**Problem 3**. Define simple communication problem: sample space – all possible outcomes, some special events and their probabilities.

| 5 | |
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| 20 | |
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