

## Control work 1 (Examples)

Variant 1.

1. Definition and example of a discrete random variable.
2. What is the probability of randomly removing from the wallet a single coin of 1 ruble from 8 different coins?
3. Bought 2 lottery tickets. What is the probability that both will win if every tenth ticket in the draw wins?
4. In how many ways you can choose 3 any books from 6 possible?
5. What is the probability that 3 boys and one girl will be born in the family?
6. Present the distribution law  $X$  for a series of tests in the form of a table when  $n = 3$ ;  $p(A) = 0.5$ .
7. Calculate statistical characteristics for data: 7, 8, 10, 9, 9

Variant 2.

1. Impossible event.
2. What is the probability without looking at the number to get on the wrong bus, if at the bus stop of 8 buses in the right direction go 3.
3. In the family of 2 children. Find the probability that both children are boys, if you know that the older one is a boy?
4. On the shelf 5 solutions A, of which one is wrong, and 4 solutions B, of which 2 are wrong. What is the probability to prepare the wrong solution AB (mix A and B), if the presence of at least one wrong component makes the solution wrong?
5. The frequency of birth of a child with a positive Rh factor in a Rh-negative mother is 10%. What is the likelihood that out of 3 a cochlea with Rh will be a child with Rh +?
6. Present the distribution law  $X$  for a series of tests in the form of a table when  $n = 3$ ;  $p(A) = 0.1$ .
7. Calculate statistical characteristics for data: 17, 18, 19, 19, 20

Variant 3.

1. What is called an experiment.
2. Randomly selected two-digit number. What is the probability that the selected number is divisible by 5?
3. How many teams of 4 people can be made up of 7 people?
4. Bought 3 lottery tickets. What is the probability that at least one will win if every tenth ticket wins?
5. The probability of normal operation of the computer is 90%. What is the probability of breakdown of 2 computers in the classroom where 5 computers are located?
6. Present the distribution law  $X$  for a series of tests in the form of a table when  $n = 3$ ;  $p(A) = 0.3$ .
7. Calculate statistical characteristics for data: 14, 16, 15, 15, 18

## Control work 2

### Option 1

1-Table shows activity of the enzyme Peroxidase in blood of mice when they were injected with medical drug:

activity of the enzyme Peroxidase in control group	activity of the enzyme Peroxidase in treatment group
46,900	50,384
43,776	47,436
45,024	47,704
44,320	49,234
43,256	48,361

- 1- Plot graph (column, vertical). Use mean and standard deviation. Use different color for each groups. Write name for axis.
- 2- Use Analyze t- test ( non paired) for control and treatment.
- 3- Are there is significantly different between analysis groups? Why?
- 4- Save results.
- 5- Copy graph in a word and write final analysis in word file.

2- Table shows decrease in the numbers of mice and their death in two groups when injected them with a medical drug :

Days	1	2	3	4	5	6	7	8	9	10
Group 1	10	10	10	9	9	6	5	3	2	1
Group 2	10	8	7	7	6	5	5	4	4	3

- 1- Create a Kaplan-Meier survival curve, then find the percentage of survival for two groups.
  - 2- Which group was more able to survive in fifth day?
  - 3- Save results.
  - 4- Copy graph in a word and write final analysis in word file.
- 3- Table shows the heart rate of frogs when injected with dopamine.

Seconds	Control	Control	treatment	treatment
1	35	31	42	36
5	43	49	50	52
10	77	57	99	102
15	145	121	125	132
20	167	185	200	168

- 1- Plot linear regression for this data
- 2- Copy graph in a word and write final analysis in word file.

## Option 2

1- Table shows the number of births in a hospital for 7 days

day	male	female
1	20	15
2	10	23
3	13	25
4	25	18
5	16	24
6	24	15
7	25	36

- 1- Plot a correct line graph with different colors.
- 2- Copy graph in a word and write final analysis in word file.

2- Table shows level of glucose for 100 children, for a week, for control group that was not given any treatment, a second group that was treated with treatment 1, and the third with treatment 2

	Increased sugar level	Decreased sugar level
control	90	10
Treatment 1	80	20
Treatment 2	65	35

- 1- Plot graph with differ colors.
- 2- Use analyze Chi- square.
- 3- Are there sig different between two treatments? Why?
- 4- Save results.
- 5- Copy graph in a word and write final analysis in word file.

3- Table shows decrease in the numbers of mice and their death in two groups when injected them with a medical drug :

Days	1	2	3	4	5
Group 1 (100 g every day)	5	5	4	4	3
Group 2 (200 g every day)	5	4	4	3	1

- 1- Create a Kaplan-Meier survival curve, then find the percentage of survival for two groups.
- 2- Which group was more able to survive in forth day?
- 3- Save results.
- 4- Copy graph in a word and write final analysis in word file.

### Option 3

1- Table shows content of sugar (mg/g wet weight) in cabbage in ontogeny under the effect of Hermon (Epin)

	8 week	12 week	16 week	20 week
control	9,576	12,754	15,68	20,41
treatment	11,23	17,97	16,1	22,50

- 1- Choose a graph interleaved bars, vertical. Use mean and standard deviation. Use different color for each groups. Write name for axis.
- 2- Analyze results by two away ANOVA, Are there sig different between two groups? Why?
- 3- Copy graph in a word and write final analysis in word file.

2- Table show decrease in the numbers of mice and their death in two groups when injected them with a medical drug :

Days	1	2	3	4	5
Group 1	10	10	10	9	9
Group 2	10	8	7	7	6

- 1- Create a Kaplan-Meier survival curve, then find the percentage of survival for two groups.
  - 2- Which group was more able to survive in third day?
  - 3- Save results.
  - 4- Copy graph in a word and write final analysis in word file.
- 3- An experiment was conducted on people suffering from hypersensitivity to different types of antihistamines and studying how they affect reducing sensitivity in the affected people.

The table shows the number of people with whom treatment succeed or not.

	Success	Failure
control	66	34
Type 1	87	13
Type 2	65	35

- 1- Plot graph with differ colors.
- 2- Use analyze Chi- square.
- 3- Are there sig different between two treatments? Why?
- 4- Copy graph in a word and write final analysis in word file.

## Option 4

1- Table shows the content of protein in blood of 3 different groups

1	2	3
46,900	50,384	46,25
43,776	47,436	43,68
45,024	47,704	48,31
44,320	49,234	45,32
43,256	48,361	46,23

1- Plot graph (column, horizontal) . Use mean and standard deviation. Use different color for each groups. Write name for axis.

2- Use Analyze one ANOVA

3- Are there is significantly different between analysis groups? Why?

4- Save results.

5- Copy graph in a word and write final analysis in word file.

2- An experiment was conducted to find out the benefit of cabbage kale on humans. The experiment involved 8 person, before and after the end of the experiment, mental performance was measured for students

Control	before	10	1	9	3	3	4	4	4
	after	4	4	4	5	1	4	3	6
Treatment	before	2	7	5	4	1	5	6	5
	after	4	4	4	5	1	4	3	6

1- Choose a graph interleaved bars, vertical. Use mean and standard deviation. Use different color for each groups. Write name for axis.

2- Analyze results by two away ANOVA, Are there sig different between two groups? Why?

3- Copy graph in a word and write final analysis in word file.

3-Find the percentage of survival for 10 mice that were fed for week a type of modified wheat as shown in the following table (numbers represent the number of surviving mice)

Days	1	2	3	4	5	6	7
Group 1	10	10	10	9	9	6	5
Group 2	10	8	7	7	6	5	4
Group 3	10	8	8	7	6	4	4

1- Use different color for each groups.

- 2- Which group was the most resistant to survival?
- 3- Save results.
- 4- Copy graph in a word and write final analysis in word file.

**Option 5**

Plot linear regression for this data which shows the heart rate of frogs when injected with dopamine. Copy graph in a word and write final analysis in word file.

Seconds	Control	Control	Control	Treated	Treated	Treated
1,	35,	31,	42,	36,	39,	25,
2,	43,	49,	50	52	40	42
3,	50,	57,	67,	87,	89,	62,
4,	77,	89,	99,	102,	145,	154,
10,	145,	121,	254,	269,	231,	262
20,	167,	187,	145,	289,	296,	271,

2-Table shows activity of the enzyme Peroxidase in blood of mice when they were injected with medical drug:

activity of the antioxidant in control group	activity of the enzyme antioxidant in treatment group
46,900	50,384
43,776	47,436
45,024	47,704
44,320	49,234
43,256	48,361

- 1- Plot graph (column, vertical) . Use mean and standard deviation. Use different color for each groups. Write name for axis.
- 2- Use Analyze (Unpaired t test) for control and treatment.
- 3- Are there is significantly different between analysis groups? Why?
- 4- Save results.
- 5- Copy graph in a word and write final analysis in word file.

4- Table shows decrease in the numbers of mice and their death in two groups when injected them with a medical drug :

Days	1	2	3	4	5
Group 1	10	10	10	9	9
Group 2	10	8	7	7	6

- 5- Create a Kaplan-Meier survival curve of survival for two groups.
- 6- Which group was more able to survive in last day?
- 7- Save results.
- 8- Copy graph in a word and write final analysis in word file.