

Mathematics homework #2

Homework consists of 8 exercises. Exercises are numbered and title with their topics are marked near the number to make solution process easier. Hints are provided to make solution process easier.

Exercise statements use parameters a, b, c , etc. to make tasks distinct for different students. List of parameter values is present in table 2 in appendix A.

Solutions should be handwritten with rather thorough explanations regarding chosen ways to solve the problems. Each solution should start with the exercise statement with the individual parameter values.

The pictures of every solution should be taken and sent to lecturer's email Sergey.Garbar@novsu.ru, **with subject including student's name with the individual number** according to table 2 of the appendix A, group number and homework number.

Homework is recommended to be submitted before 9th of January 2021.

Exercise 1: discrete random variables

Random variable X is determined by its distribution given in table 1. Find probability p_3 .

Table 1 — Probability distribution of random variable X

x_i	a	b	c	7
p_i	0.1	d	p_3	e

Exercise 2

What is $P(X > 0)$?

Hint: it will help to write out the probability distribution table with individual parameter values.

Exercise 3

What is the expected value $E(X)$?

Exercise 4

What is the variance $Var(X)$? What is the standard deviation σ_X ?

Exercise 5: normal distribution

Random variable Z has a normal distribution with mean g and standard deviation f . Find $P(Z > h)$.

Exercise 6: sample statistics

Fill in the frequency table for the sample $c, f, g, h, i, j, c, g, i, c, i, f, h, j, g, c, f, j, c, j$.

Hint: it will help to write out the sample as the numbers for each variant.

Exercise 7

Find the sample mean.

Exercise 8

Find the sample standard deviation.

Appendix A: individual parameter values

Table 2 — Parameter values for exercises

Individual number	Student name	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
1	Абуелмагд Халед Аттиа Вахба Гад	-5	1	4	0.3	0.4	10	7	4	17	8
2	Али Мустафа Гамал Ахмед	-4	2	5	0.4	0.2	11	9	5	18	9
3		-6	-2	6	0.1	0.3	12	11	6	12	10
4	Аль Бевани Мохаммед Акрам Кака Ахмед	-7	-1	4	0.2	0.4	13	13	8	16	11
5	Мосса Мохамед Халафаллах Махвуз	-5	-3	5	0.3	0.2	14	14	10	17	12
6	Мохамед Осама Сабер Хассан	-4	1	6	0.4	0.3	8	15	4	18	13
7	Селим Мостафа Осман Ахмед	-6	2	4	0.1	0.4	9	7	5	12	14
8	Мохамед Зияд Фагих Абделаиз	-7	-2	5	0.2	0.2	10	9	6	16	15
9	Саад Афаф Акмаль Морси	-5	-1	6	0.3	0.3	11	11	8	17	16
10	Радния Марьям Рамин	-4	-3	4	0.4	0.4	12	13	10	18	4
11	Радния Амир Рамин	-6	1	5	0.1	0.2	13	14	4	12	5
12	Шехата Мохамед Сами Заки	-7	2	6	0.2	0.3	14	15	5	16	6
13	Шихата Ахмед Эльхилали Эльсаид Мохамед	-5	-2	4	0.3	0.4	8	7	6	17	7
14		-4	-1	5	0.4	0.2	9	9	8	18	8
15		-6	-3	6	0.1	0.3	10	11	10	12	9
16		-7	1	4	0.2	0.4	11	13	4	16	10
17		-5	2	5	0.3	0.2	12	14	5	17	11
18		-4	-2	6	0.4	0.3	13	15	6	18	12
19		-6	-1	4	0.1	0.4	14	7	8	12	13
20		-7	-3	5	0.2	0.2	8	9	10	16	14