



Διαγωνισμός Στατιστικής 2021.

Questionnaire checking

A - Λυκειακός κύκλος

1 - Τεστ βασικών γνώσεων

Εκδοχή: 1 Γλώσσα: en

1. The semester grade for a course at Lyceum is derived as follows:

a) Quizzes (three in total): 5% each

b) Test: 12%

c) Homework 15%

d) Participation in the course: 18%

e) Final examination: 40%

The grade of a student in a specific course was: Test 78/100, homework 85/100, participation in the course 90/100, final exam 89/100. Student's grades in the three quizzes were 11/12, 8/12 and 7/12, respectively. The semester grade for this course, for this student:

A. 16,9/20

B. 16,4/20

C. 17,0/20

D. 16,7/20

2. How many times do we have to roll the dice to be 70% sure that 6 will turn up at least once?

A. 6

B. 7

C. 8

D. 9

3. In equation $x^2+bx+c+2=0$ the numbers b and c are the outcome of two consecutive rolls of an unbiased dice. The probability that the equation has two different real roots is:

A. 2/3

B. 1/4

C. $\frac{1}{3}$

D. $\frac{11}{36}$

4. The points $O(0,0)$, $A(20,0)$ and $B(0,10)$ are vertices of a triangle. A point $K(x,y)$ inside the triangle is randomly selected. The probability that $y < 2x$ is:

A. 0,85

B. 0,15

C. 0,2

D. 0,8

5. Two integers are selected at random from the set $\{1, 2, 3, \dots, 101\}$. Given that the sum of the selected numbers is even, the probability that both numbers are even is:

A. 0,49

B. 0,24

C. 0,495

D. 0,252

6. A subscription web password consists of ten characters. The password has the following specifications:

a) The first two characters must be any 2 letters of the 26 letters of the Latin alphabet. The letters can be repeated.

b) The next five characters must consist of 5 different digits of the set $A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

c) The last three characters must be the following 3 special characters, in any order: @, , &.

For example, such a code could be "bb50937&@#". What is the probability that a random code formed with the above specifications has, first letter "m", the first numeric digit greater than the last and first special character @?

A. $4,58 \times 10^{-3}$

B. $6,41 \times 10^{-3}$

C. 0,85

D. 0,23

7. The following table shows the results of a survey in which 146 people were asked if they are university graduates and if they plan to go on vacation next summer. A person is randomly selected from the research sample. Find the probability that the selected person is planning summer vacations given that he/she is a university graduate.

		I will go on vacation next summer		
		YES	NO	TOTAL
I am a university graduate	YES	87	28	115
	NO	14	17	31
	TOTAL	101	45	146

- A. 0,62
 B. 0,86
 C. 0,76
 D. 0,66

8. Two sets of 20 observations, have the same standard deviation $\sigma = 5$. The first set has mean $\bar{x}_1 = 17$ and the other $\bar{x}_2 = 22$. The standard deviation of the set obtained when the two sets are combined is:

- A. 6,12
 B. 3,53
 C. 5,0
 D. 5,59

9. It has been observed that the mood of an athlete while competing is associated with the energy he manifests in his sport. The table below has measurements for 8 athletes. The correlation coefficient of the two variables is:

Mood (x)	6	7	5	21	13	5	13	14
Energy (y)	28	23	29	22	29	19	28	19

- A. -0,175
- B. 0,175
- C. -0,008
- D. 0,008

10. The probability for A new COVID-19 diagnostic test to detect the disease in an infected person is 90%. In cases where the test is performed on a person who is not infected, the specific test is negative at a rate of 95%. The test is being tested in a community where 25% of the population is infected by the virus. A person from the community is randomly selected and is tested for COVID-19 virus using the new test. What is the probability that this person has been infected given that the test is positive?

- A. 0,8571
- B. 0,2250
- C. 0,2625
- D. 0,7125



Διαγωνισμός Στατιστικής 2021.

Questionnaire checking

B - Γυμνασιακός κύκλος

1 - Τεστ βασικών γνώσεων

Εκδοχή: 1 Γλώσσα: en

1. **The semester grade for a course at Gymnasium is derived as follows:**
 - a) Quizzes (four in total): 5% each
 - b) Tests (two in total): 18%
 - c) Homework 30%
 - d) Participation in the course: 22%
 - e) Assessment of class notes: 10%

. The grades of a student in a specific course were: Mean score of the two tests 78/100, homework 85/100, participation in the course 90/100, class notes 89/100. Student's grades in the four quizzes were 16/20, 15/20, 18/20 and 19/20, respectively. The semester grade for this course, for this student is:

 - A. 17,0/20
 - B. 16,4/20
 - C. 16,9/20
 - D. 16,7/20

2. **According to the latest census of the Statistical Service of Cyprus, the total number of regular residences was 297122, of which 204039 were in urban and 93083 in rural areas. Their distribution by province is given in the table below.**

For a survey it was decided to select a sample of 2.5% of the total population of regular residences in Cyprus. This size is to be distributed proportionally in urban and rural areas both nationwide and by province. What will the sample size of regular residences for the Pafos urban area be (rounded up to the nearest integer)?

	Urban	Rural
Nicosia	88359	28035
Ammochostos	0	15616
Larnaca	29370	19671
Limassol	64093	19534
Pafos	22217	10227

- A. 256
- B. 555
- C. 5555
- D. 2557

3. The table below shows the population in the European Union as well as in various European countries between 2015 and 2019. What is the ratio of the percentage of population growth in Cyprus between 2015 and 2019 to the rate of population growth in the European Union, in the corresponding period?

GEO/TIME	2015	2016	2017	2018	2019
European Union	443,666,812	444,802,830	445,534,430	446,098,424	446,824,564
Belgium	11,237,274	11,311,117	11,351,727	11,398,589	11,455,519
Bulgaria	7,202,198	7,153,784	7,101,859	7,050,034	7,000,039
Czechia	10,538,275	10,553,843	10,578,820	10,610,055	10,649,800
Denmark	5,659,715	5,707,251	5,748,769	5,781,190	5,806,081
Germany	81,197,537	82,175,684	82,521,653	82,792,351	83,019,213
Estonia	1,314,870	1,315,944	1,315,635	1,319,133	1,324,820
Ireland	4,677,627	4,726,286	4,784,383	4,830,392	4,904,240
Greece	10,858,018	10,783,748	10,768,193	10,741,165	10,724,599
Spain	46,449,565	46,440,099	46,528,024	46,658,447	46,937,060
France	66,458,153	66,638,391	66,809,816	66,918,941	67,012,883
Croatia	4,225,316	4,190,669	4,154,213	4,105,493	4,076,246
Italy	60,795,612	60,665,551	60,589,445	60,483,973	60,359,546
Cyprus	847,008	848,319	854,802	864,236	875,899
Latvia	1,986,096	1,968,957	1,950,116	1,934,379	1,919,968
Lithuania	2,921,262	2,888,558	2,847,904	2,808,901	2,794,184
Luxembourg	562,958	576,249	590,667	602,005	613,894

- A. 2,4
- B. 3,4

C. 4,8

D. 0,2

4. George has 65 cents in his pocket in coins (the Euro has 5c, 10s, 20c and 50c coins). What is the probability that George has more than 3 coins of 10 cents in his pocket?

A. 0,78

B. 0,5

C. 0,67

D. 0,22

5. Let the positive integers 1, 2, 3, x, 7, 6, 4, 1, 2, y. If 1 and 2 are the mode numbers, the mean is 4 and $x < y$, then the value of y is:

A. 0,1587

B. 0,1950

C. 0,0975

D. 0,8413

6. In a box there are yellow, green, blue, and black balls. The blue ones are twice the green ones. The yellows are 16 and the black ones are 6. The probability of randomly selecting a yellow ball is $P=0.4$. The probability of randomly selecting a blue ball is:

A. 0,15

B. 0,3

C. 0,45

D. 0,225

7. The table below shows the results of a survey in which 146 people were asked if they are university graduates and if they plan to go on vacation next summer.

A person is randomly selected from the research sample. Find the probability that the selected person is planning summer vacations given that he/she is a university graduate.

		I will go on vacation next summer		
		YES	NO	TOTAL
I am a university graduate				
	YES	87	28	115
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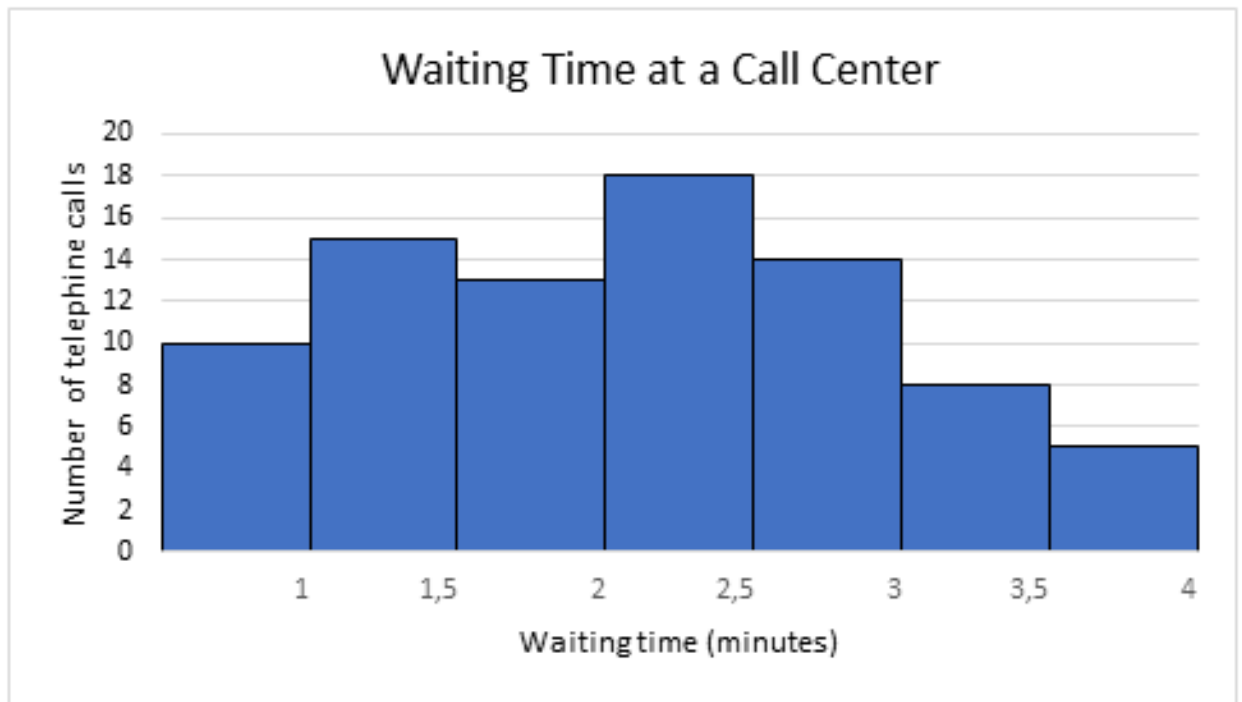
- A. 0,62
- B. 0,86
- C. 0,76
- D. 0,66

8. Twelve observations are taken from a population and ordered in ascending order. If the median is 18,6 and the mean is 17,97 then the ratio of x to y is:

9,2	12,5	x	x	x	17,4	y	y	21	23,2	23,2	24,2
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- A. 1,311
- B. 2,288
- C. 0,437
- D. 0,763

9. The following diagram shows the waiting time at a company's call center for a number of customers during a working day. Use the diagram to calculate the probability that a random phone call during the day will be served in less than 2 minutes.



- A. 0,301
- B. 0,458
- C. 0,542
- D. 0,309

10. A survey on the number of children in families yielded the results presented in the table that follows. In the pie chart illustrating this data, the central angle for families with one child is:

2	3	1	2	1	2	3	1	2
6	1	2	3	3	4	1	5	2
3	2	1	2	1	2	4	5	2
2	2	3	1	1	3	1	1	2
2	3	4	2	3				

- A. $96,59^\circ$
- B. $87,8^\circ$
- C. $105,37^\circ$

D. 99^0