



## 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



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### Questionnaire checking

A - Λυκειακός κύκλος

1 - Τεστ βασικών γνώσεων

Εκδοχή: 2 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 81/100, homework 79/100, participation in the course 95/100, final exam 97/100. Student's grades in the three quizzes were 12/12, 10/12 and 5/12, respectively. The semester grade for this course, for this student:

A. 17,4/20

B. 17,7/20

C. 18,0/20

D. 17,8/20

2. The following table shows 7 pairs of observations from two variables of a population. What is the relationship between the two variables?

A. 11

B. 8

C. 9

D. 10

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. 28/36

B. 24/36

C.  $25/36$

D.  $27/36$

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

A. 0,5

B. 0,15

C. 0,85

D. 0,8

5. Two integers are selected at random from the set  $\{1, 2, 3, \dots, 201\}$ . Given that the sum of the selected numbers is even, the probability that both numbers are even is:

A. 0,246

B. 0,495

C. 0,498

D. 0,251

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

a) The first three characters must be any 3 letters of the 26 letters of the Latin alphabet. The letters can be repeated.

b) The next four characters must consist of 4 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 "bbb5097&@#". 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.  $7,12 \times 10^{-4}$

B. 0,15

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

D.  $3,56 \times 10^{-3}$

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 not 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. 0,10  
 B. 0,14  
 C. 0,55  
 D. 0,45

8.

Two sets of 20 observations, have the same standard deviation  $\sigma = 6$ .

The first set has mean  $\bar{x}_1 = 17$  and the other  $\bar{x}_2 = 24$ .

The standard deviation of the set obtained when the two sets are combined is:

- A. 6,95  
 B. 4,30  
 C. 7,03  
 D. 5,0

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)	12	15	13	35	18	11	20	30

- A. 0,935
- B. -0,935
- C. 0,021
- D. -0,021

**10. The probability for A new COVID-19 diagnostic test to detect the disease in an infected person is 92%. In cases where the test is performed on a person who is not infected, the specific test is negative at a rate of 97%. 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. 0,9109
- B. 0,2525
- C. 0,2300
- D. 0,7275





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### Questionnaire checking

**A - Λυκειακός κύκλος**

**1 - Τεστ βασικών γνώσεων**

Εκδοχή: 3 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 65/100, homework 95/100, participation in the course 88/100, final exam 92/100. Student's grades in the three quizzes were 8/12, 10/12 and 12/12, respectively. The semester grade for this course, for this student:**

A. 17,5/20

B. 17,0/20

C. 17,4/20

D. 17,3/20

**2. How many times do we have to roll the dice to be 90% sure that 6 will turn up at least once?**

A. 11

B. 12

C. 13

D. 14

**3. In equation  $x^2+bx+c+1=0$  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. 5/12

B. 7/18

C.  $2/3$

D.  $7/12$

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. 0,25

B. 0,2

C. 0,8

D. 0,85

5. Two integers are selected at random from the set  $\{1, 2, 3, \dots, 301\}$ . Given that the sum of the selected numbers is even, the probability that both numbers are even is:

A. 0,248

B. 0,498

C. 0,497

D. 0,251

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 24 letters of the Greek 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 "KK50937&@#". What is the probability that a random code formed with the above specifications has, first letter "Ω", the first numeric digit greater than the last and first special character @?

A.  $7,72 \times 10^{-3}$

B. 0,15

C.  $3,86 \times 10^{-3}$

D.  $6,94 \times 10^{-3}$

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 not 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. 0,24  
B. 0,62  
C. 0,76  
D. 0,55

8.

Two sets of 20 observations, have the same standard deviation  $\sigma = 4$ .

The first set has mean  $\bar{x}_1 = 17$  and the other  $\bar{x}_2 = 23$ .

The standard deviation of the set obtained when the two sets are combined is:

- A. 5,83  
B. 5,0  
C. 3,9  
D. 6,55

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)	10	15	12	25	18	19	21	35

- A. 0,676
- B. -0,676
- C. 0,017
- D. -0,017

**10. The probability for A new COVID-19 diagnostic test to detect the disease in an infected person is 89%. In cases where the test is performed on a person who is not infected, the specific test is negative at a rate of 96%. 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. 0,8811
- B. 0,6975
- C. 0,2775
- D. 0,2525