



Statistics Competition 2024.

Questionnaire checking

B - Lower secondary

1 - Basic knowledge test

Version: 1 Language: en

1. The mean weight of 21 employees is 80 kg. Charalambos, Vasiliki and Loukas are among the employees. Charalambos weighs twice as much as Vasiliki and Loukas is 12 kg lighter than Charalambos. If Charalambos, Vasiliki and Loukas are removed from the group, the mean weight of the remaining employees is 79 kg. Loukas weighs:

- A. 96 kg
- B. 54 kg
- C. 110,4 kg
- D. 98,4 kg

2. A number is randomly selected from the set $A = \{10, 13, 14, 15\}$ and a number is randomly selected from the set $B = \{15, 17, 19\}$. The probability that the sum of the two numbers is a multiple of 3 is:

- A. 0,33
- B. 0,25
- C. 0,67
- D. 0,75

3.

A confectionery company manufactures colored chocolates. It sells them in a package of 200 grams. The amount of each color of chocolate in the package is not fixed. However, the probability of a random selection from each color in a 200-gram package is given in the next table.

| | | | | | | |
|-------------|--------|--------|------|-------|--------|-------|
| Color | Yellow | Orange | Red | Green | Blue | Brown |
| Probability | 0,175 | 0,175 | 0,15 | x | x+0,05 | x |

A chocolate is chosen at random from a package. The probability that the chocolate is either blue or orange is:

- A. 0,2
- B. 0,375
- C. 0,035
- D. 0,625

4.

Two of the digits 0 , 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 are randomly selected and placed in the empty positions of the six-digit number (each digit can be chosen twice):

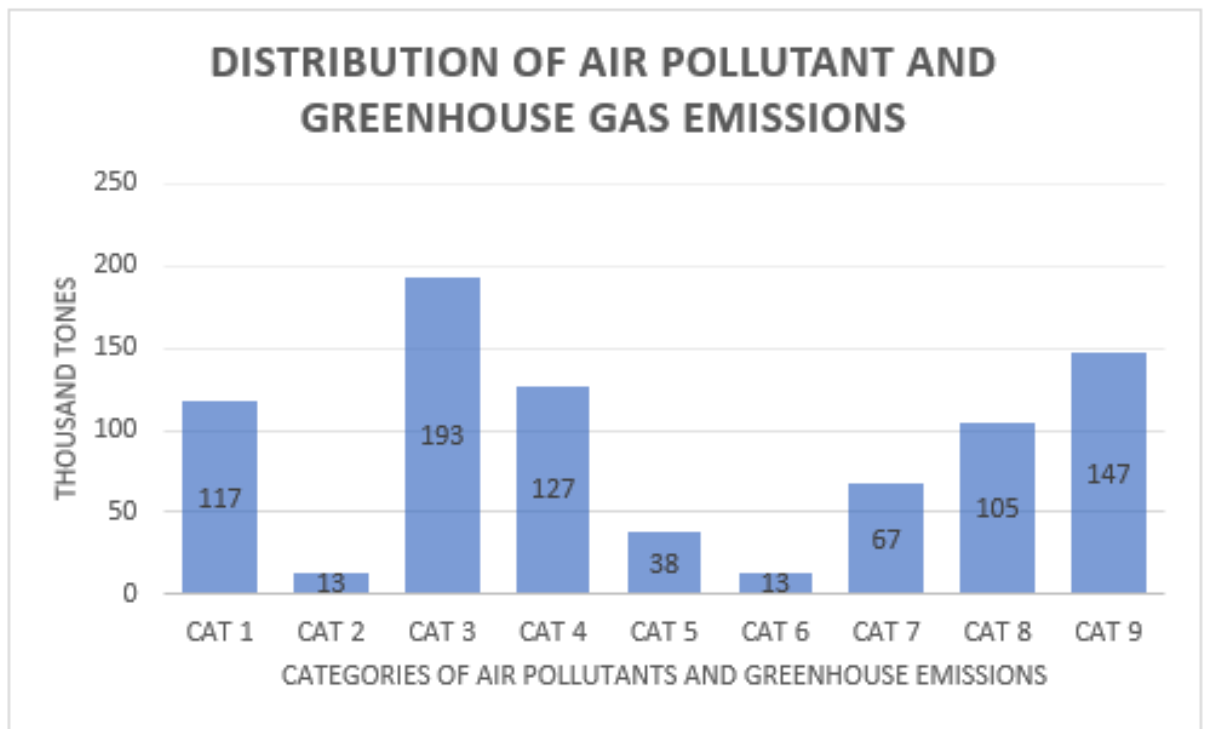
$$5 _ 9 _ 12$$

The probability that the number formed is divisible by 4 and 9 is:

- A. 0,89
- B. 0,25
- C. 0,11
- D. 0,33

5.

The bar chart shows the distribution of air pollutant and greenhouse gas emissions during the last four months of 2022 in the countries of the European Union in terms of nine pollutant categories (see table).



| Categories of air pollutants and greenhouse gases | |
|---|---|
| CAT 1 | Agriculture, forestry and fishing |
| CAT 2 | Mining and quarrying |
| CAT 3 | Manufacturing |
| CAT 4 | Supply of electricity, gas, steam and air conditioning supply |
| CAT 5 | Water supply, sewerage, waste management |
| CAT 6 | Construction activities |
| CAT 7 | Services (except transport and storage) |
| CAT 8 | Transport and storage |
| CAT 9 | Total household activities |

If we construct a pie chart for the above data, the central angle corresponding to the "Construction activities" category is:

- A. $6,34^\circ$
- B. $1,58^\circ$
- C. $5,71^\circ$
- D. $57,07^\circ$

6. A gift is placed in one of 5 identical boxes. Marios is asked to choose a box at random. If he chooses the box containing the gift, he gets the gift and a new gift is placed in the box. If he does not choose the box with the gift, then the gift is placed back into one of the 5 boxes. Marios tries 3 times. The probability of winning exactly 2 gifts is:

- A. 0,064
- B. 0,48
- C. 0,224
- D. 0,096

7.

The following table shows the applications by faculty and by gender that were accepted (YES) or rejected (NO) by the four faculties of a university for the current academic year.

| Faculty | Philosophy | | Polytechnic | | Economics | | Science | | Total | |
|---------|------------|----|-------------|-----|-----------|-----|---------|-----|-------|-----|
| | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO |
| Men | 121 | 43 | 250 | 68 | 210 | 97 | 149 | 60 | 730 | 268 |
| Women | 270 | 53 | 102 | 39 | 220 | 90 | 99 | 53 | 691 | 235 |
| Total | 391 | 96 | 352 | 107 | 430 | 187 | 248 | 113 | 1421 | 503 |

Based on the above data, only two of the following statements are correct. Which of the statements are correct?

- A. This particular university favored applications for admission from women.
- B. One first-year student is selected at random. Given that the student attends either the Faculty of Philosophy or the Faculty of Science, the probability that she is a woman is 0.58.
- C. One applying for a position in the Faculty of Philosophy is more easily accepted than another applying for a position in the Faculty of Economics.
- D. One first-year student is selected at random. Given that the student is male, the probability that he attends the Polytechnic Faculty is 0.71.

- A. B and C
- B. A and C
- C. A and D
- D. C and D

8. Three teams A, B and C participate in a competition. The probability that team A will win the prize is twice the probability that team B will win it. The ratio of the probability that team B will win the competition to the probability that team C will win is 2:3. The probability that team A will win the competition is:

A. 0,44

B. 0,22

C. 0,16

D. 0,33

9. Two boxes A and B contain 50 balls numbered $\{1, 2, 3, \dots, 49, 50\}$ each. From each box we randomly select one ball. The probability that the number of the ball selected from box B is less than that of box A is:

A. 0,52

B. 0,48

C. 0,51

D. 0,49

10. There are 7 cards numbered with positive integers. Two of them have the numbers 2 and 6. The median of the numbers on the cards is 8, the mode is 2 and 10, and the mean value is 7. The numbers on the cards could be:

A. $\{2, 6, 2, 10, 10, 8, 11\}$

B. $\{2, 6, 2, 10, 10, 8, 9\}$

C. $\{2, 6, 2, 8, 10, 9, 12\}$

D. $\{2, 6, 5, 10, 10, 8, 8\}$

- A. 0,026
- B. 0,675
- C. 0,325
- D. 0,175

4.

Two of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 are randomly selected and placed in the empty positions of the six-digit number (each digit can be chosen twice):

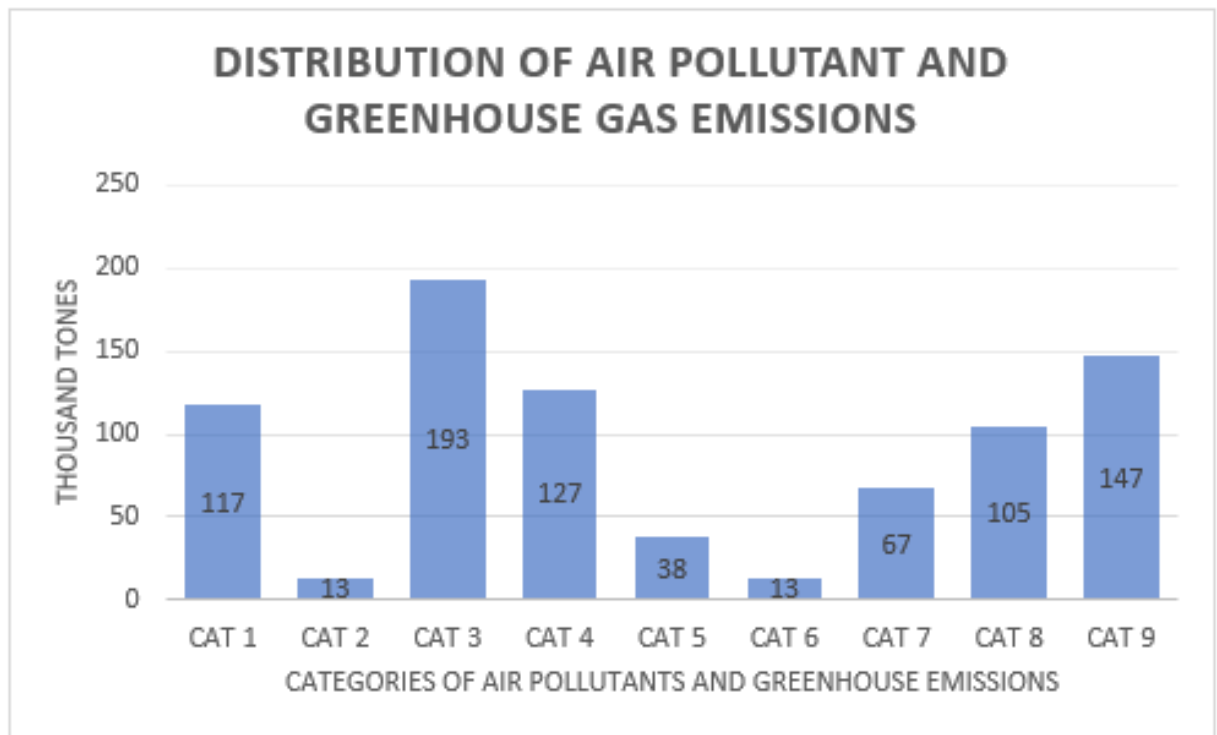
$$2 _ 3 _ 20$$

The probability that the number formed is divisible by 4 and 9 is:

- A. 0,89
- B. 0,11
- C. 0,25
- D. 0,33

5.

The bar chart shows the distribution of air pollutant and greenhouse gas emissions during the last four months of 2022 in the countries of the European Union in terms of nine pollutant categories (see table).



| Categories of air pollutants and greenhouse gases | |
|---|---|
| CAT 1 | Agriculture, forestry and fishing |
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| CAT 4 | Supply of electricity, gas, steam and air conditioning supply |
| CAT 5 | Water supply, sewerage, waste management |
| CAT 6 | Construction activities |
| CAT 7 | Services (except transport and storage) |
| CAT 8 | Transport and storage |
| CAT 9 | Total household activities |

If we construct a pie chart for the above data, the central angle corresponding to the "Transport and storage" category is:

- A. $4,61^\circ$
- B. $51,21^\circ$
- C. $12,80^\circ$

D. $46,10^\circ$

6. A gift is placed in one of 6 identical boxes. Marios is asked to choose a box at random. If he chooses the box containing the gift, he gets the gift and a new gift is placed in the box. If he does not choose the box with the gift, then the gift is placed back into one of the 6 boxes. Marios tries 3 times. The probability of winning exactly 2 gifts is:

A. 0,069

B. 0,185

C. 0,417

D. 0,046

7.

The following table shows the applications by faculty and by gender that were accepted (YES) or rejected (NO) by the four faculties of a university for the current academic year.

| Faculty | Philosophy | | Polytechnic | | Economics | | Science | | Total | |
|---------|------------|----|-------------|-----|-----------|-----|---------|-----|-------|-----|
| | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO |
| Men | 121 | 43 | 250 | 68 | 210 | 97 | 149 | 60 | 730 | 268 |
| Women | 270 | 53 | 102 | 39 | 220 | 90 | 99 | 53 | 691 | 235 |
| Total | 391 | 96 | 352 | 107 | 430 | 187 | 248 | 113 | 1421 | 503 |

Based on the above data, only two of the following statements are correct. Which of the statements are correct?

A. This particular university favored applications for admission from women.

B. One first-year student is selected at random. Given that the student attends either the Polytechnic Faculty or the Faculty of Economics, the probability that she is a woman is 0.47.

C. One applying for a position in the Faculty of Philosophy is more easily accepted than another applying for a position in the Faculty of Economics.

D. One first-year student is selected at random. Given that the student is male, the probability that he attends the Polytechnic Faculty is 0.34.

A. C and D

B. A and B

C. A and C

D. B and C

8. Three teams A, B and C participate in a competition. The probability that team A will win the prize is twice the probability that team B will win it. The ratio of the probability that team B will win the competition to the

probability that team C will win is 2:3. The probability that team B will win the competition is:

A. 0,22

B. 0,44

C. 0,33

D. 0,16

9. Two boxes A and B contain 40 balls numbered {1, 2, 3, ..., 39, 40} each. From each box we randomly select one ball. The probability that the number of the ball selected from box B is more than that of box A is:

A. 0,48

B. 0,5

C. 0,51

D. 0,49

10. There are 7 cards numbered with positive integers. Two of them have the numbers 3 and 8. The median of the numbers on the cards is 8, the mode is 3 and 10, and the mean value is 7. The numbers on the cards could be:

A. {3, 8, 3, 10, 10, 9, 6}

B. {3, 8, 3, 10, 10, 7, 9}

C. {3, 8, 3, 10, 10, 8, 7}

D. {3, 8, 3, 9, 10, 9, 7}



Statistics Competition 2024.

Questionnaire checking

B - Lower secondary

1 - Basic knowledge test

Version: 3 Language: en

1. **The mean weight of 21 employees is 80 kg. Charalambos, Vasiliki and Loukas are among the employees. Charalambos weighs twice as much as Vasiliki and Loukas is 17 kg lighter than Charalambos. If Charalambos, Vasiliki and Loukas are removed from the group, the mean weight of the remaining employees is 79 kg. Loukas weighs:**
 - A. 96,4 kg
 - B. 113,4 kg
 - C. 93 kg
 - D. 110 kg

2. **A number is randomly selected from the set $A=\{12, 13, 14, 15\}$ and a number is randomly selected from the set $B=\{17, 18, 21\}$. The probability that the sum of the two numbers is a multiple of 3 is:**
 - A. 0,17
 - B. 0,58
 - C. 0,83
 - D. 0,42

3.

A confectionery company manufactures colored chocolates. It sells them in a package of 200 grams. The amount of each color of chocolate in the package is not fixed. However, the probability of a random selection from each color in a 200-gram package is given in the next table.

| Color | Yellow | Orange | Red | Green | Blue | Brown |
|-------------|--------|--------|------|-------|--------|-------|
| Probability | 0,175 | 0,175 | 0,15 | x | x+0,05 | x |

A chocolate is chosen at random from a package. The probability that the chocolate is either blue or red is:

- A. 0,35
- B. 0,65
- C. 0,03
- D. 0,20

4.

Two of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 are randomly selected and placed in the empty positions of the six-digit number (each digit can be chosen twice):

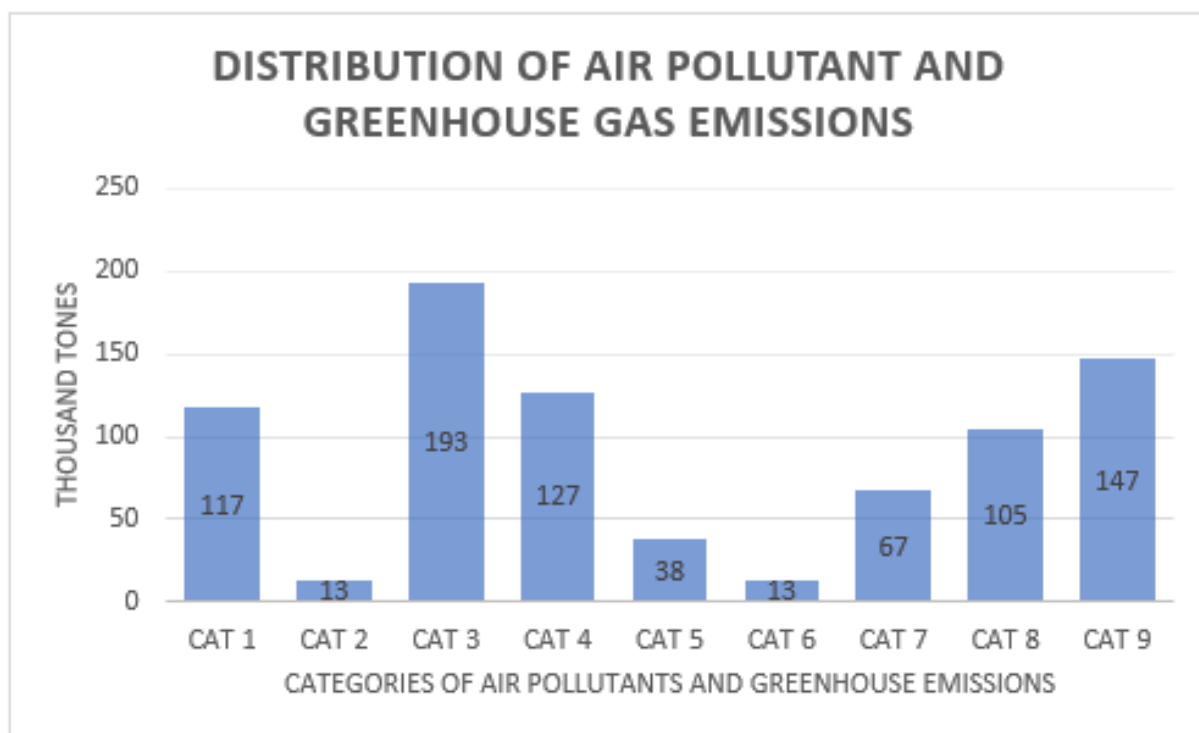
$$9 _ 8 _ 16$$

The probability that the number formed is divisible by 4 and 9 is:

- A. 0,11
- B. 0,89
- C. 0,25
- D. 0,33

5.

The bar chart shows the distribution of air pollutant and greenhouse gas emissions during the last four months of 2022 in the countries of the European Union in terms of nine pollutant categories (see table).



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| CAT 5 | Water supply, sewerage, waste management |
| CAT 6 | Construction activities |
| CAT 7 | Services (except transport and storage) |
| CAT 8 | Transport and storage |
| CAT 9 | Total household activities |

If we construct a pie chart for the above data, the central angle corresponding to the "Services" category is:

- A. $8,17^\circ$
- B. $29,41^\circ$
- C. $32,68^\circ$
- D. $81,71^\circ$

6. A gift is placed in one of 4 identical boxes. Marios is asked to choose a box at random. If he chooses the box containing the gift, he gets the gift and a new gift is placed in the box. If he does not choose the box with the gift, then the gift is placed back into one of the 4 boxes. Marios tries 3 times. The probability of winning exactly 2 gifts is:

- A. 0,09
- B. 0,56
- C. 0,14
- D. 0,28

7.

The following table shows the applications by faculty and by gender that were accepted (YES) or rejected (NO) by the four faculties of a university for the current academic year.

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Based on the above data, only two of the following statements are correct. Which of the statements are correct?

- A. One applying for a position in the Faculty of Economics is more easily accepted than another applying for a position in the Faculty of Science.
- B. This particular university favored applications for admission from women.
- C. One first-year student is selected at random. Given that the student studies either in the Faculty of Philosophy or in the Faculty of Science, the probability that he is male is 0.42.
- D. One first-year student is selected at random. Given that the student is male, the probability that he attends the Polytechnic Faculty is 0.71.

- A. B and C
- B. A and C
- C. B and D
- D. A and D

8. Three teams A, B and C participate in a competition. The probability that team A will win the prize is twice the probability that team B will win it. The ratio of the probability that team B will win the competition to the probability that team C will win is 2:3. The probability that team C will win the competition is:

- A. 0,22

B. 0,44

C. 0,33

D. 0,16

9. Two boxes A and B contain 60 balls numbered {1, 2, 3, ..., 59, 60} each. From each box we randomly select one ball. The probability that the number of the ball selected from box B is less than that of box A is:

A. 0,51

B. 0,49

C. 0,5

D. 0,48

10. There are 7 cards numbered with positive integers. Two of them have the numbers 4 and 5. The median of the numbers on the cards is 7, the mode is 4 and 10, and the mean value is 7. The numbers on the cards could be:

A. {4, 5, 4, 10, 10, 7, 9}

B. {5, 5, 4, 10, 10, 7, 9}

C. {4, 7, 4, 10, 10, 8, 6}

D. {4, 5, 5, 10, 10, 7, 8}