

Test 1. Basic Knowledge

Category A: Upper Secondary

EXERCISE 1

Television viewing rates of the “Masterchef 3” finals, last May, reached 33%. A survey company conducted a telephone survey the next day, looking for viewers of the contest among the public. Each researcher had to reach a specific number of questionnaires by viewers of the contest. Towards the end of the day, George, who works for the survey company, found that he needed only one more questionnaire to reach his goal. What is the probability that he will reach his goal by making less than seven phone calls? (Assume that all respondents answered the telephone questionnaire).

Answer:

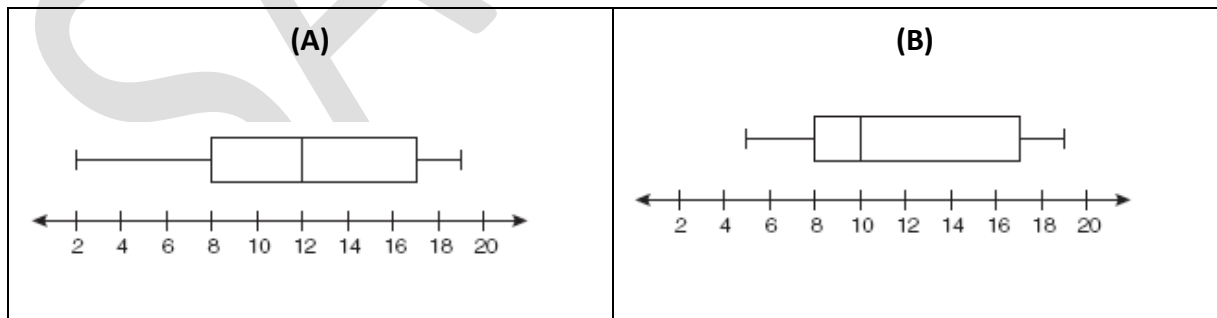
- A. **0,91** B. 0,94 Γ. 0,03 Δ. 0,02

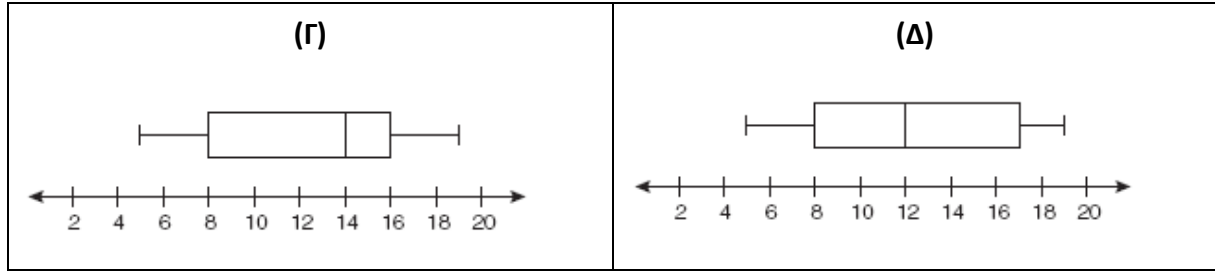
EXERCISE 2

Jacob is saving a portion of his weekly earnings in the hope of buying a new bike. Below are his economies, in euros, for the last 15 weeks.

| | | | | | | | | | | | | | | |
|----|----|---|---|----|----|---|----|---|----|----|---|---|----|---|
| 19 | 12 | 9 | 7 | 17 | 10 | 6 | 18 | 9 | 14 | 19 | 8 | 5 | 17 | 9 |
|----|----|---|---|----|----|---|----|---|----|----|---|---|----|---|

Which of the box-plots describes these data?





Answer:

- A. (A) B. **(B)** Γ. (Γ) Δ. (Δ)

EXERCISE 3

How many times does one need to roll a fair die, in order to have that the probability of obtaining a number less than 3 at least once, is equal to $\frac{211}{243}$?

Answer:

- A. 9 B. **5** Γ. 27 Δ. 81

EXERCISE 4

A school assistant found five school bags and five jerseys in the gym. She placed the five jerseys, at random upon the five bags. What is the probability that at least three jerseys were correctly paired with the right school bags?

Answer:

- A. **$\frac{11}{120}$** B. $\frac{2}{15}$ Γ. $\frac{1}{8}$ Δ. $\frac{1}{20}$

EXERCISE 5

Two samples A and B are defined as follows: Sample A: $x_1, x_2, x_3, \dots, x_v$ and sample B: $k \cdot x_1, k \cdot x_2, k \cdot x_3, \dots, k \cdot x_v$, where k is a constant real number. If S_A and S_B are the standard deviations of samples A and B respectively, then the ratio $\frac{S_B}{S_A}$ is equal to:

Answer:

- A. **|k|** B. $\frac{1}{|k|}$ Γ. $\frac{1}{k^2}$ Δ. k^2

Category B: Lower Secondary

EXERCISE 1

The following table presents real data provided by the Statistical Service of Cyprus, on unemployed labour force regarding various professional categories during three months, September, October and November 2019. A survey on 5.5% of all the unemployed is required. Due to fluctuations in the number of unemployed during the three months recorded, it is more appropriate to take as the rate of unemployed, and for each occupational category separately, the average of the rates recorded for the three months, September, October and November. The sample will then be broken down by professional category. What will the sample size be in the "Production Craftsmen" category?

UNEMPLOYED BY PROFESSIONAL CATEGORY

| | September | October | November |
|---------------------------------------|--------------|--------------|--------------|
| Managers and Administrative Officers | 706 | 721 | 840 |
| Qualified & Other Specialists | 2104 | 1735 | 1719 |
| Technical Assistants | 1015 | 965 | 1170 |
| Writers, Typewriters, Treasurers | 2890 | 2865 | 3843 |
| Service Officers, Vendors | 3809 | 3896 | 7692 |
| Farmers & Skilled Farmers | 34 | 34 | 54 |
| Production Craftsmen | 1097 | 1068 | 1144 |
| Machine Operators, Assemblers | 474 | 479 | 893 |
| Cleaners, Callers & Unskilled Workers | 3094 | 3242 | 5690 |
| Military Officers | 63 | 48 | 48 |
| Newcomers | 1682 | 1491 | 1402 |
| Total | 16968 | 16544 | 24495 |

Answer:

A. 71

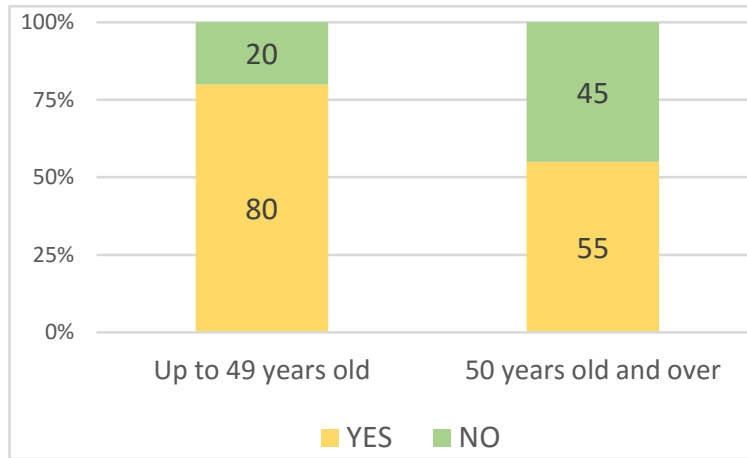
B. 60,6

Γ. 65

Δ. **61**

EXERCISE 2

In a survey a sample of citizens is asked whether they use the internet daily. The following graph shows the results between two age groups, respondents up to 49 years old and those 50 years old and over.



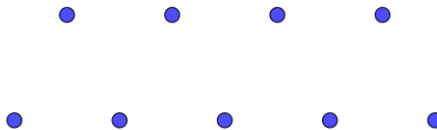
In the survey, 70% of respondents use the internet. The percentage of people up to 49 years who participated in the survey is:

Answer:

- A. 60% B. 70% Γ. 80% Δ. 90%

EXERCISE 3

All possible triangles are formed using the points on the top and bottom row, in the figure below, as their vertices. One of all these triangles is chosen at random. What is the probability of this triangle having only one vertex in the top row?



Answer:

- A. 0,57 B. 0,43 Γ. 0,13 Δ. 0,06

EXERCISE 4

A sample of 190 students at a school was asked to name their favourite fruit. Their answers are shown in the following table in which the ratio of x to y is 3: 2.

| | Apple | Orange | Bannana | Peach | Pineapple | Any other |
|--------------------|-------|--------|---------|-------|-----------|-----------|
| Number of students | 45 | 30 | 20 | x | y | 15 |

The data were presented in a pie chart. The angle of the circular sector corresponding to the "peach" is:

Answer:

A. $60,6^\circ$

B. $90,9^\circ$

Γ. $25,3^\circ$

Δ. $16,8^\circ$

EXERCISE 5

There are 8 yellow and 12 blue balls in a bag. Two balls are drawn from the bag, one after the other, without being placed back in the bag. This experiment is repeated until two balls of the same color are picked. The probability that the experiment will not be terminated after its first run is:

Answer:

A. $\frac{24}{95}$

B. $\frac{48}{95}$

Γ. $\frac{24}{25}$

Δ. $\frac{12}{25}$