EUROPEAN STATISTICS COMPETITION 2019-20

TEST 1 – LOWER SECONDARY

Version 1

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

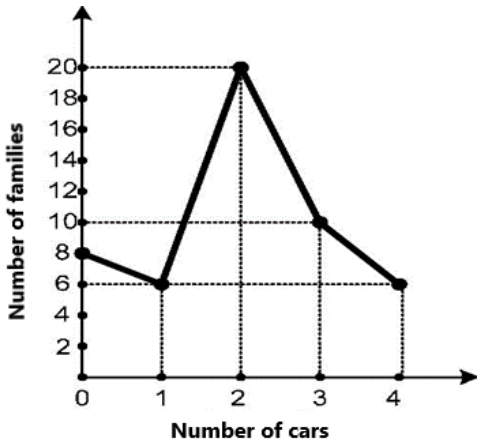
	September	October	November
Managers and Administrative Officers	706	721	840
Qualified & Other Specialists	2104	1735	1719
Technical Assistants	1015	965	1170
Writers, Typewriters, Treasurers	2890	2865	3843
Service Officers, Vendors	3809	3896	7692
Farmers & Skilled Farmers	34	34	54
Production Craftsmen	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

A survey recorded the number of cars owned by each family in a community. The data is presented in the adjacent chart. What is the percentage of families who own at least one but less than three cars?



Answer:

A. 72% **B.** 52% **Γ.** 40% **Δ.** 28%

Exercise 3

Students in a class had a blood test. The blood group of each student is listed in the following table. Two students from the class are selected at random. What is the probability of the two students having the same blood type?

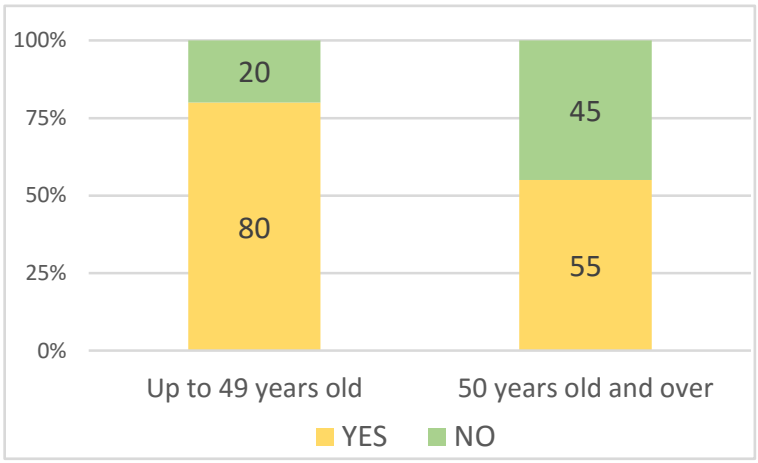
A	B	B	AB	AB	B	O	O
AB	O	B	A	AB	A	O	O
AB	B	O	A	AB	O	B	A

Answer:

A. 0,2 **B.** 0,221 **Γ.** 0,253 **Δ.** 0,21

Exercise 4

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 5

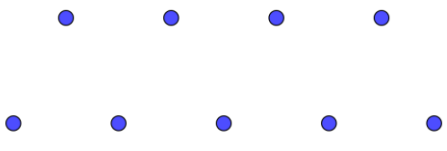
Let the positive integers 1, 2, 3, x, 7, 6, 4, 1, 2, y. If 1 and 2 are the mode numbers, the mean is 4, and x <y, then the value of y is:

Answer:

A. 9 **B.** 5 **Γ.** 11 **Δ.** 10

Exercise 6

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 7

John remembers that the code to open his suitcase is 4 digits long. He also remembers that the first digit is 3 and that the code number is divided by 4. What is the probability of opening his suitcase on the first attempt?

Answer:

A. $\frac{1}{300}$ **B.** $\frac{1}{250}$ **Γ.** $\frac{1}{220}$ **Δ.** $\frac{1}{200}$

Exercise 8

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. $60{,}6^o$ **B.** $90{,}9^o$ **Γ.** $25{,}3^o$ **Δ.** $16{,}8^o$

Exercise 9

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.** $\frac{12}{25}$

Exercise 10

A cosmetics company is producing a new lotion for newborns. After massive testing it was noted that three out of twenty newborns are allergic to the lotion. If a sample of newborns is tested for allergic symptoms, one baby after the other, what is the probability that the first allergic baby to be spotted will be the 4th in the series?

Answer:

A. 0,092 **B.** 0,522 **Γ.** 0,614 **Δ.** 1

Version 2

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 "Service Officers, Vendors category?

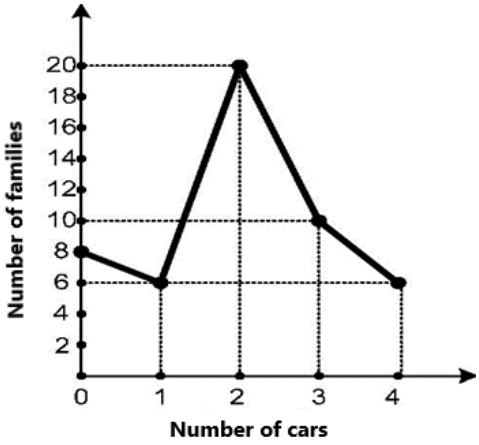
UNEMPLOYED BY PROFESSIONAL CATEGORY			
	September	**October**	**November**
Managers and Administrative Officers	706	721	840
Qualified & Other Specialists	2104	1735	1719
Technical Assistants	1015	965	1170
Writers, Typewriters, Treasurers	2890	2865	3843
Service Officers, Vendors	3809	3896	7692
Farmers & 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. 282,3 **B.** 855 **Γ.** 282 **Δ.** 2042

Exercise 2

A survey recorded the number of cars owned by each family in a community. The data is presented in the adjacent chart. What is the percentage of families with at least two but less than four cars?



Answer:

Α. 20% **Β.** 68% **Γ.** 72% **Δ.** 60%

Exercise 3

Students in a class had a blood test. The blood group of each student is listed in the following table. Two students from the class are selected at random. What is the probability of the two students having different blood type?

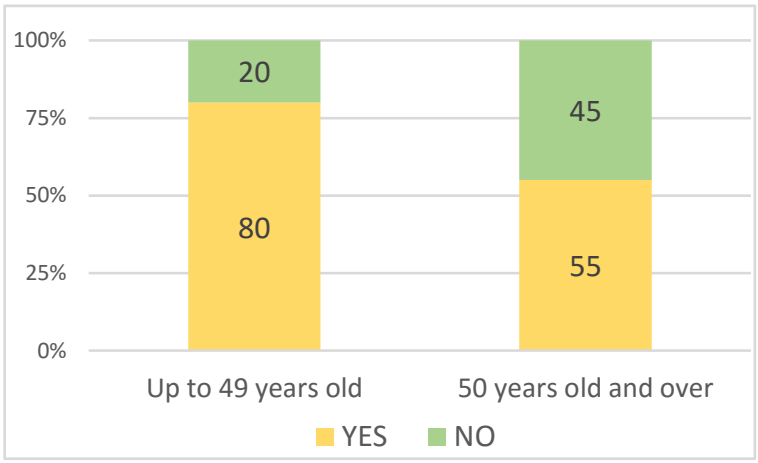
A	B	B	AB	AB	B	O	O
AB	O	B	A	AB	A	O	O
AB	B	O	A	AB	O	B	A

Answer:

Α. 0,22 **Β.** 0,87 **Γ.** 0,78 **Δ.** 0,13

Exercise 4

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, 65% of respondents use the internet. The percentage of people up to 49 years who participated in the survey is:

Answer:

A. 80% **B.** 75% **Γ.** 65% **Δ.** 40%

Exercise 5

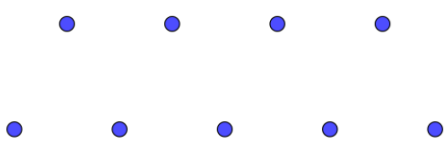
Let the positive integers 1 ,2, 3, x, 5, 6, 4, 1, 2, y. If 1 and 2 are the mode numbers, the mean is 4, and x <y, then the value of y is:

Answer:

A. 5 **B.** 11 **Γ.** 9 **Δ.** 7

Exercise 6

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 bottom row?



Answer:

A. 0,04 **B.** 0,09 **Γ.** 0,57 **Δ.** 0,43

Exercise 7

John remembers that the code to open his suitcase is 4 digits long. He also remembers that the first digit is 3 and that the code number is divided by 5. What is the probability of opening his suitcase on the first attempt?

Answer:

A. $\frac{1}{22}$ **B.** $\frac{1}{200}$ **Γ.** $\frac{1}{50}$ **Δ.** $\frac{1}{20}$

Exercise 8

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 "pineapple" is:

Answer:

A. $60{,}6^o$ **B.** $90{,}9^o$ **Γ.** $25{,}3^o$ **Δ.** $16{,}8^o$

Exercise 9

There are 6 yellow and 14 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. $\frac{21}{25}$ **B.** $\frac{21}{50}$ **Γ.** $\frac{21}{95}$ **Δ.** $\frac{42}{95}$

Exercise 10

A cosmetics company is producing a new lotion for newborns. After massive testing it was noted that two out of twenty newborns are allergic to the lotion. If a sample of newborns is tested for allergic symptoms, one baby after the other, what is the probability that the first allergic baby to be spotted will be the 4th in the series?

Answer:

A. 0,6561 **B.** 0,073 **Γ.** 0,1 **Δ.** 1

Version 3

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 "Technical Assistants" 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
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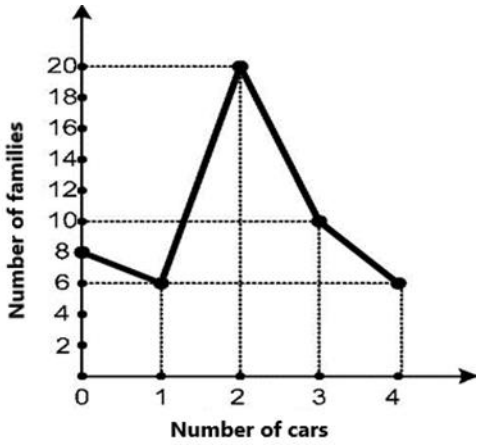
Cleaners, Callers & Unskilled Workers	3094	3242	5690
Military Officers	63	48	48
Newcomers	1682	1491	1402
Total	**16968**	**16544**	**24495**

Answer:

A. 60,7 **B.** 58 **Γ.** 57,7 **Δ.** 63

Exercise 2

A survey recorded the number of cars owned by each family in a community. The data is presented in the adjacent chart. What is the percentage of families with at least two cars?



Answer:

A. 68% **B.** 52% **Γ.** 40% **Δ.** 32%

Exercise 3

Students in a class had a blood test. The blood group of each student is listed in the following table. Three students from the class are selected at random. What is the probability of the three students having the same blood type?

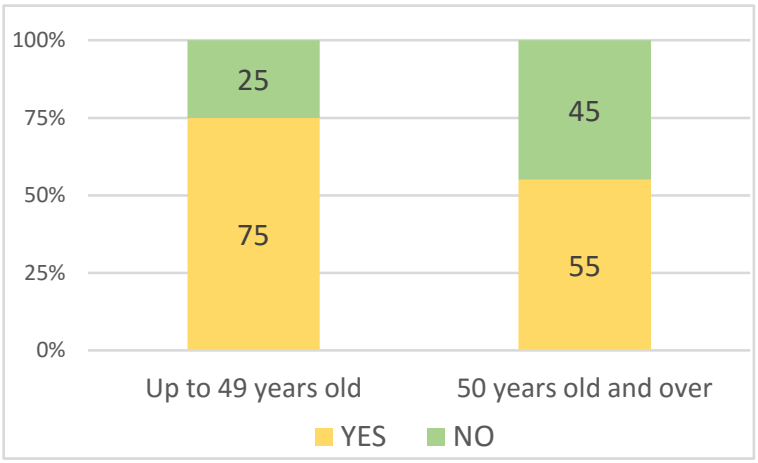
A	B	B	AB	AB	B	O	O
AB	O	B	A	AB	A	O	O
AB	B	O	A	AB	O	B	A

Answer:

A. 0,042 **B.** 0,42 **Γ.** $\frac{65}{1508}$ **Δ.** $\frac{260}{6027}$

Exercise 4

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, 65% of respondents use the internet. The percentage of people up to 49 years who participated in the survey is:

Answer:

A. 75% **B.** 60% **Γ.** 55% **Δ.** 50%

Exercise 5

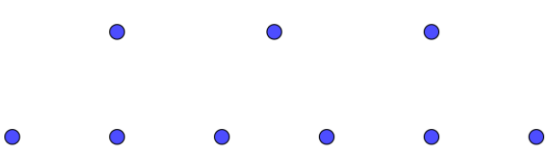
Let the positive integers 1 ,2, 3, x, 9, 6, 4, 1, 2, y. If 1 and 2 are the mode numbers, the mean is 4, and x <y, then the value of y is:

Answer:

A. 6 **B.** 9 **Γ.** 5 **Δ.** 7

Exercise 6

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. 0,29 **B.** 0,71 **Γ.** 0,08 **Δ.** 0,21

Exercise 7

John remembers that the code to open his suitcase is 4 digits long. He also remembers that the first digit is 3 and that the code number is divided by 25. What is the probability of opening his suitcase on the first attempt?

Answer:

A. $\frac{1}{40}$ **B.** $\frac{1}{20}$ **Γ.** $\frac{1}{250}$ **Δ.** $\frac{1}{200}$

Exercise 8

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: 5.

	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. $56{,}8^o$ **B.** $94{,}7^o$ **Γ.** $15{,}8^o$ **Δ.** $26{,}3^o$

Exercise 9

There are 4 yellow and 16 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. $\frac{32}{95}$ **B.** $\frac{16}{95}$ **Γ.** $\frac{8}{25}$ **Δ.** $\frac{4}{25}$

Exercise 10

A cosmetics company is producing a new lotion for newborns. After massive testing it was noted that four out of twenty newborns are allergic to the lotion. If a sample of newborns is tested for allergic symptoms, one baby after the other, what is the probability that the first allergic baby to be spotted will be the 5th in the series?

Answer:

A. 0,328 **B.** 0,082 **Γ.** 0,2 **Δ.** 1