



## PROPORTION AND STATISTICS TEST

### 3° ESO

**Exercise 1: (1 point)** One of my students suggested to prepare a fruit salad as a Christmas dessert. But no more than three different fruits, please, or we will never end. So tell me, how many grams of kiwis, 2.25 €/kg would I have to mix with half a kilo of bananas 1.85 €/kg and 300 grams of oranges, 1.30 €/kg to get a mixture whose price was of 1.75 €/kg ?

**Exercise 2: (2 points)** Given the following table showing the values and frequencies of a certain random variable

$x_i$	0	1	2	3	5
$f_i$	7	9	10	5	3

Work out:

- The percentage corresponding to each value of the variable
- The measures of dispersion
- Plot the frequency polygon

**Exercise 3: (2 points)** Given the following table showing the values and frequencies of a certain random variable

$x_i$	[0,4]	(4,8]	(8,12]	(12,16]
$f_i$	7	5	4	2

Work out:

- Classify the random variable
- The median and the mode
- The standard deviation
- Plot the bar diagram, the histogram and the frequency polygon

**Exercise 4: (1 point)** Divide €1230 in an inversely proportional way to 2, 3 and 7.

**Exercise 5: (1 point)** I think I will buy a "Turkish Grammar" book to try and finally get the knack of that "beautiful" language. I've checked two online libraries and, on the first of them, it has a price of 35.45€ with a 15% discount and no shipping costs. On the second one, the price is of 34.5€ with a 25% discount, but I'd have to pay a 4.25€ shipping fee. Which library should I choose? What am I doing ???

**Exercise 6: (1 point)** Two of Santa's reindeers are feeling unwell this year and he doesn't think that they can travel. Damn it. Last Christmas, with all seven reindeers in good conditions, he travelled 125000 km in 8 hours. He has asked the Magi for help and now he will only have to cover 80000 km. How long is it going to take them? Round the answer to hours, minutes and seconds.

**Exercise 7: (1 point)** The other day I read in the newspaper that Renaissance Technologies offered an average 66% annual interest rate to its clients since it was founded back in 1988. If one of those clients invested 100€ back then, how much money would they have thirty years later?

**Exercise 8: (1 point)** I want to know if the working conditions of elves have improved since they went on a strike three years ago and some of them were fired. So, now that Santa is back in town, I am visiting one hundred malls all over Spain to ask them how much money they earn each month. Classify the random variable, indicate the population and the sample and tell me if, finally, this time I managed to do it right.



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**Exercise 1: (1 point)** One of my students suggested to prepare a fruit salad as a Christmas dessert. But no more than three different fruits, please, or we will never end. So tell me, how many grams of kiwis, 2.25 €/kg would I have to mix with half a kilo of bananas 1.85 €/kg and 300 grams of oranges, 1.30 €/kg to get a mixture whose price was of 1.75 €/kg ? **160 grams**

**Exercise 2: (2 points)** Given the following table showing the values and frequencies of a certain random variable

$x_i$	0	1	2	3	5
$f_i$	7	9	10	5	3

a) The percentage corresponding to each value of the variable

$x_i$	0	1	2	3	5
<b>%</b>	<b>21</b>	<b>26</b>	<b>29</b>	<b>15</b>	<b>9</b>

b) The measures of dispersion

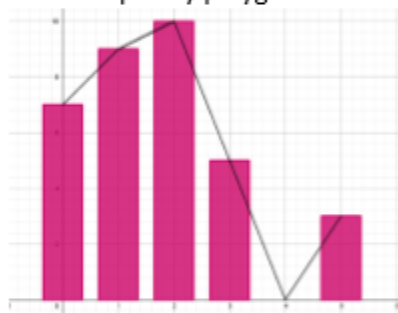
$$R = 5$$

$$\sigma^2 = 1.94$$

$$\sigma = 1.39$$

$$CV = 0.8$$

c) Plot the frequency polygon



**Exercise 3: (2 points)** Given the following table showing the values and frequencies of a certain random variable

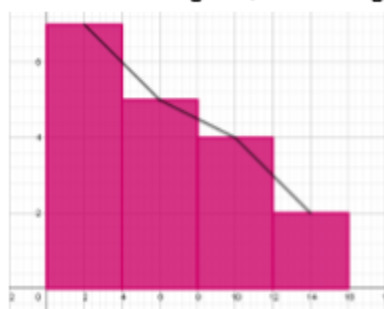
$x_i$	[0,4]	(4,8]	(8,12]	(12,16]
$f_i$	7	5	4	2

a) Classify the random variable **Quantitative continuous**

b) The median and the mode  **$Mo = [0,4]$**   **$Me = (4,8]$**

c) The standard deviation  **$\sigma = 4.11$**

d) Plot the bar diagram, the histogram and the frequency polygon



**Exercise 4: (1 point)** Divide €1230 in an inversely proportional way to 2, 3 and 7

$$e = 630\text{€} \quad v = 420\text{€} \quad a = 180\text{€}$$

**Exercise 5: (1 point)** I think I will buy a "Turkish Grammar" book to try and finally get the knack of that "beautiful" language. I've checked two online libraries and, on the first of them, it has a price of 35.45€ with a 15% discount and no shipping costs. On the second one, the price is of 34.5€ with a 25% discount, but I'd have to pay a 4.25€ shipping fee. Which library should I choose? What am I doing ????

The final price is the same in both libraries, 30.13€, so choose the one that brings it faster

**Exercise 6: (1 point)** Two of Santa's reindeers are feeling unwell this year and he doesn't think that they can travel. Damn it. Last Christmas, with all seven reindeers in good conditions, he travelled 125000 km in 8 hours. He has asked the Magi for help and now he will only have to cover 80000 km. How long is it going to take them? Round the answer to hours, minutes and seconds 7h10'5"

**Exercise 7: (1 point)** The other day I read in the newspaper that Renaissance Technologies offered an average 66% annual interest rate to its clients since it was founded back in 1988. If one of those clients invested 100€ back then, how much money would they have thirty years later? 401090745€

Yeah, man, that's 400 million euro !!!

**Exercise 8: (1 point)** I want to know if the working conditions of elves have improved since they went on a strike three years ago and some of them were fired. So, now that Santa is back in town, I am visiting one hundred malls all over Spain to ask them how much money they earn each month. Classify the random variable, indicate the population and the sample and tell me if, finally, this time I managed to do it right.

Random variable: quantitative discrete, since elves are paid with gold coins

Population: working elves

Sample: 100 elves

Nope, the sample is not representative, since we don't know which elves were sent to Spain and why, maybe the ones in the States are getting a different number of coins. And what about the ones who stayed with Santa? What are they being paid? And it's not just about money, working conditions should also consider number of working hours a day, paid holidays, health insurance and so on ;)