STATISTICS: REPRESENTING DATA 13 OCTOBER 2014

Lesson Description

In this lesson we

- Discuss the measures of central tendency and dispersion.

Summary

Measures of Central Tendency

- Mean (the average)
- Median(the middle value)
- Mode (value occurring the most times)

Measures of Dispersion

Clustering around central measure or widely dispersed around the central measure:

- Standard Deviation – dispersion around the mean
- Inter Quartile Range – dispersion around the median

Test Yourself

Question 1

The tuck shop at Great Future High School sells cans of soft drinks. The Environmental Club at the school decided to have a can-collection project for three weeks to make learners aware of the effects of litter on the environment.

The data below shows the number of cans collected on each school day of the three week project.

58	83	85	89	94
97	98	100	105	109
112	113	114	120	145

1.1 Calculate the mean number of cans collected over the three-week period. (2)

1.2 Calculate the standard deviation. (2)

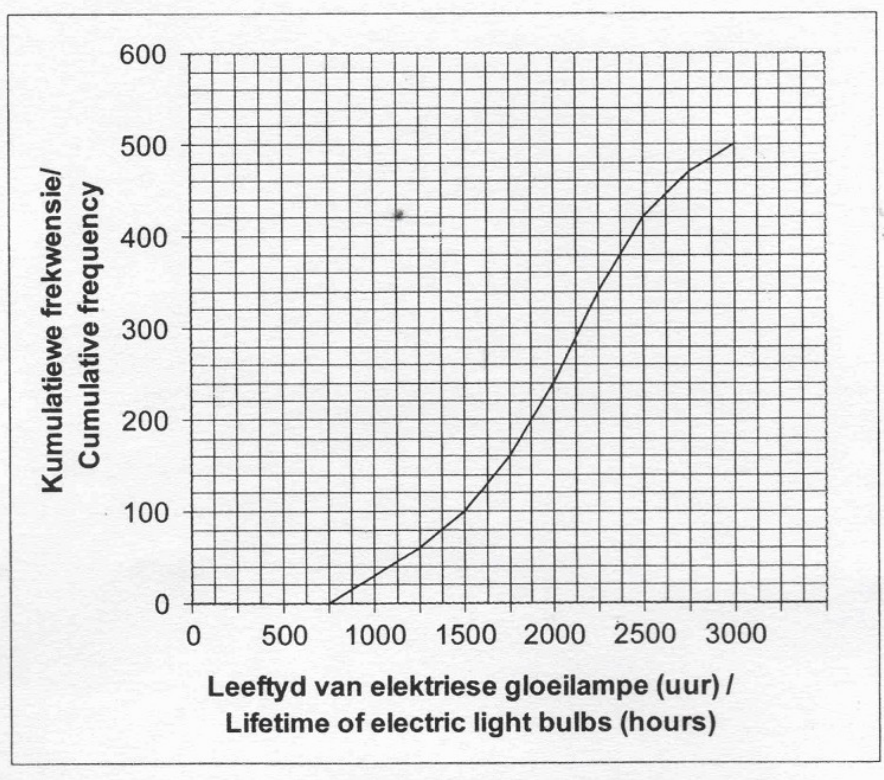
1.3 Determine the lower and upper quartiles of the data. (2)

1.4 Draw a boxplot to represent the data (5)

1.5 On how many days did the number of cans collected lie outside of the one standard deviation of the mean? (3)

Question 2

The lifetime of electric light bulbs was measured in a laboratory. The results are shown in the cumulative frequency diagram. Use the cumulative frequency curve to determine the following:



2.1 How many light bulbs were tested. (2)

2.2 The median lifetime of the electriclight bulbs tested. (2)

2.3 The interquartile range. (2)

2.4 The number of electric light bulbs with a lifetime of between1 750 and 2 000 hours. (2)

2.5 If the cost of one light bulb is R5.00, determine the amount spent on purchasing the light bulbs that lasted longer than 2 500 hours. (2)

Improve your Skills

Question 1 The Mean and the Median

(Adapted from Nov 2009, Grade 12, Paper 2)

The data below shows the total monthly rainfall (in millimetres) at Cape Town International Airport for the year 2002.

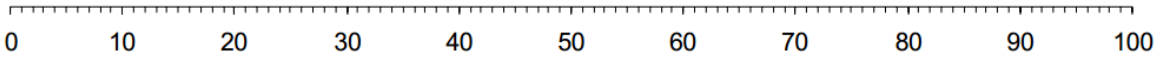
Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
60,9	14,9	9,3	28,0	71,9	76,4	98,2	65,7	26,1	32,5	23,6	15,0

[Source: www.1stweather.com]

1.1 Determine the mean monthly rainfall for 2002. (2)

1.2 Write down the five-number summary for the data. (5)

1.3 Draw a box and whisker diagram for the data below. (3)



1.4 By making reference to the box and whisker diagram, comment on the spread of the rainfall for the year. (2)

1.5 Calculate the standard deviation for the data. (3)

Question 2 The Mean and Standard Deviation in a Frequency Table

Consider the table below which shows the marks of 100 Grade 11 students out of 6.

Mark (x)	Frequency (f)
1	4
2	10
3	27
4	39
5	12
6	8
TOTAL	$\sum f = n = 100$

Calculate the mean and the standard deviation.

Question 3 The Median of Grouped Data

The time taken (to the nearest minute) for a certain task to be completed was recorded on 48 occasions and the following data was obtained:

Time (in minutes)	Frequency
$11 \leq t < 15$	6
$15 \leq t < 19$	9
$19 \leq t < 23$	13
$23 \leq t < 27$	12
$27 \leq t \leq 30$	8

3.1 Determine the cumulative frequency of the data

3.2 Draw an ogive of the data

3.3 Determine the median and Inter Quartile Range of the Data.

Cumulative Frequency Curve showing the time taken to complete a task