

## Statistics 2 – Measures of spread

Please **complete** this homework by \_\_\_\_\_. Start it early. If you can't do a question you will then have time to ask your teacher for help or go to a drop in session.

**Section 1 – Review of previous topics. Please complete all questions.**

Remember to use your calculator as often as you can in the most efficient way!

**Q1.** Find the mean, median, and mode of the following data

3, 4, 5, 5, 5, 6, 9, 11, 13, 15, 15, 19

**Q2.** Find the mean, the modal group and use interpolation to find the median of the following data. (Think about your class boundaries)

x	f
$7 \leq x < 10$	3
$11 \leq x < 16$	7
$17 \leq x < 20$	15
$21 \leq x < 28$	8
$29 \leq x < 35$	2

**Q4.** Find the median and quartiles of this data.

23, 11, 17, 34, 52, 41, 37, 43, 31, 23, 56

**Q3.** Use interpolation to find the quartiles and the median of the data.

x	f
$0 \leq x < 10$	9
$10 \leq x < 20$	15
$20 \leq x < 30$	24
$30 \leq x < 40$	36
$40 \leq x < 50$	10
$50 \leq x < 60$	6

**Section 2 – Consolidation of this week's topic. Please complete all questions.**

**Q1.**

For a set of 20 items of data  $\sum x = 22$  and  $\sum x^2 = 55$ . Find the mean and standard deviation of the data.

(3 marks)

**Q2.** The marks obtained by 50 students are summarised below

Marks	0	1	2	3	4	5	6	7	8	9	10
Frequency	1	2	2	3	6	9	2	7	5	2	1

- a) Use your calculator to work out the standard deviation of the marks.  
 b) How many students received the number of marks more than one standard deviation above the mean.

*(4 marks)*

**Q3.** A student collected data on the height of 50 female students at his college. He found the mean was 163.52 and the standard deviation 2.53 cm. Find  $\sum fx$  and  $\sum fx^2$

*(2 marks)*

He later found that he had two more pieces of data, 162 cm and 170 cm. Calculate the new mean and standard deviation for all 52 students.

*(2 marks)*

**Q4.** Ellie wants to investigate rainfall in the UK in 2015. She takes a random sample of 14 days from July 2015 from Heathrow from the large data set.

The data collected is summarised in the table below

Amount of rainfall ( $r$ mm)	Frequency
trace	7
$1 < r \leq 2$	4
$2 < r \leq 4$	3
$r > 4$	0

- a) Work out an estimate for the mean and standard deviation of Ellie's data.  
 b) Interpret the value of your standard deviation in a)  
 c) i) Interpret the suitability of Ellie's sampling method for her investigation  
 ii) Suggest how Ellie could make better use of the large data set for her study.

*(6 marks)*

**Q5.** A set of data of size 50 has a mean of 15 and a variance of 48. Find  $\sum x$  and  $\sum x^2$

*(3 marks)*

**Q6.** For a set of 20 numbers  $\sum x = 100$  and  $\sum x^2 = 1240$

For a different set of 25 numbers  $\sum x = 144$  and  $\sum x^2 = 1600$

Find the mean and standard deviation of the combined set of 45 numbers.

*(5 marks)*

**Total marks = 25 marks**

Section 3 – Large Data Set question. If you are aiming for a top grade, you should attempt these questions.

**Q1.** Find the mean and standard deviation of the Daily mean visibility in Camborne in May 1987 and in May 2015 and compare the results over the two different years.

Daily mean visibility in Camborne May 1987

Daily Mean Visibility (Dm)
2000
3200
3600
4100
2700
1000
600
2400
900
4100
2500
2400
4600
3100
4500
3700
2900
2300
1900
1600
2700
2600
1400
1000
2500
1500
500
1600
1500
900
1400

Daily mean visibility in Camborne May 2015

Daily Mean Visibility (Dm)
2000
500
600
1000
1100
1300
2100
900
1500
700
1000
1800
1700
1700
1600
1500
2300
1200
1800
2600
1700
300
400
700
1000
1700
1600
2000
2300
2200
1200