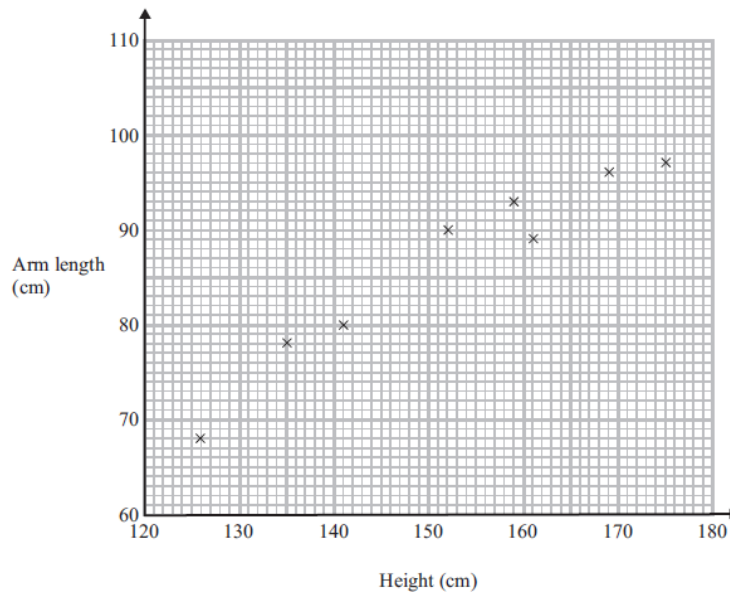# Statistics 1 – Measures of central tendency

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.

Q1   The scatter graph shows information about the height and arm length of each of 8 students in Year 11.

a) What type of correlation does this scatter graph show?

A different student in Year 11 has a height of 148 cm
b) Estimate the arm length of this student.

Q2.   80 Children went on a school trip. They went to London or to York.
23 boys and 19 girls went to London
14 boys went to York.
a) Use this information to complete the two-way table.

	London	York	Total
Boys			
Girls			
Total			

One of these 80 children is chosen at random.

b) What is the probability that this child went to London?

Q3.   Here are seven tiles

| 1 | 1 | 2 | 2 | 2 | 3 | 3 |

Jim takes a tile at random. He does NOT replace the tile. Jim then takes at rando a second tile.

a) Calculate the probability that both the tiles Jim takes have a number 1 on them.

b) Calculate the probability that the number on the second tile Jim takes is greater than the number on the first tile he takes.

Q4.   There are 4 red counters in a bag and x blue counters. 2 counters are removed from the bag at random. The probability that both counters taken are blue is 1/3.

a) Show that $x^2 - 5x - 6 = 0$

b) Find the value of x

Section 2 – Consolidation of this week's topic. Please <u>complete</u> all questions. (Total 44 marks)

Q1.   Give the class boundaries, mid-points and class widths for the 8-10 and11-15 classes in the data that is grouped:

        5-7,   8-10,   11-15,   16-20 etc.   *(6 marks)*

Q2.   Give 2 advantages and 2 disadvantages of grouping data.

                                                                                     (4 marks)

Q3.   The table below summarises the weights, in kilograms, of a random sample of forty prize pigs:

Mass (kg)	90-94	95-99	100-104	105-109	110-114	115-119
Frequency	4	7	6	13	9	1

a) Estimate the mean of the masses for this distribution
b) Use linear interpolation to estimate the median mass
c) What is the modal group
d) Explain (briefly) why the answers to a) and b) are only estimates.

                                                                                     (8 marks)

Q4. At a garage which did MOT car tests, the number of cars tested each day, over a 13 day working period, was as follows.

3   10   8   6   8   3   2   2   8   7   11   12   4

Find: (a) the mode,   (b) the median   (c) the quartiles of these numbers.

(4 marks)

Q5. The birth weights, in kg, of 1500 babies are summarised in the table below.

Weight (kg)	Midpoint, x kg	Frequency, f
0.0 – 1.0	0.50	1
1.0 – 2.0	1.50	6
2.0 – 2.5	2.25	60
2.5 – 3.0		280
3.0 – 3.5	3.25	820
3.5 – 4.0	3.75	320
4.0 – 5.0	4.50	10
5.0 – 6.0		3

[You may use $\sum fx = 4841$ and $\sum fx^2 = 15\,889.5$]

a) Write down the missing midpoints in the table above   *(2 marks)*

b) Calculate an estimate of the mean birth weight   *(2 marks)*

c) Use liner interpolation to find the inter-quartile rang of birth weights to 3sf   *(6 marks)*

Q6. Sunita and Shelley talk to one another once a week on the telephone. Over many weeks they recorded, to the nearest minute, the number of minutes spent in conversation on each occasion. The following table summarises their results.

Time (to the nearest minute)	Number of Conversations
5–9	2
10–14	9
15–19	20
20–24	13
25–29	8
30–34	3

Two of the conversations were chosen at random.

a)   Find the probability that both of them were longer than 24.5 minutes.   *(2 marks)*

The midpoint of each class was represented by x and its corresponding frequency by f, giving $\sum fx = 1060$

b)   Calculate an estimate of the mean time spent on their conversations.   *(2 marks)*

During the following 25 weeks they monitored their weekly conversations and found that at the end of the 80 weeks their overall mean length of conversation was 21 minutes.

    c)   Find the mean time spent in conversation during these 25 weeks.   *(4 marks)*

    d)   Comment on the 2 mean values.   *(2 marks)*

Q7.   The times, in seconds, taken by 20 people to solve a simple numerical puzzle are given below.

17	19	22	26	28	31	34	36	38	39
41	42	43	47	50	51	53	55	57	58

    a)   Use your calculator to find the mean, median and mode of these times   *(3 marks)*

In fact, 23 people solved the puzzle, not 20. However, 3 of the people failed to solve it within the allotted time of 60 seconds.

    b)   Calculate the median and the quartiles of the times taken by all of the 23 people. *(3 marks)*

    c)   For the times taken by all 23 people, explain why:

        i)   The mode is NOT an appropriate numerical measure

        ii)   The range is not an appropriate numerical measure.   *(2 marks)*

Total marks = 50 marks