Measures of Location and Spread - Edexcel Past Exam Questions

*1. Summarised below are the distances, to the nearest mile, travelled to work by a random sample of 120 commuters.

Distance (to the nearest mile)	Number of commuters
0 – 9	10
10 – 19	19
20 – 29	43
30 – 39	25
40 – 49	8
50 – 59	6
60 – 69	5
70 – 79	3
80 – 89	1

For this distribution,

(*a*) use linear interpolation to estimate its median. **(2)**

The mid-point of each class was represented by x and its corresponding frequency by f giving

$$\Sigma fx = 3550 \text{ and } \Sigma fx^2 = 138020$$

(*b*) Estimate the mean and standard deviation of this distribution.

(3)

(*c*) State, with a reason, whether you should use the mean or the median to represent the data in this distribution. **(2)**

(*d*) State the circumstance under which it would not matter whether you used the mean or the median to represent a set of data. **(1)**

Jan 07 Q4

*2. The following table summarises the distances, to the nearest km, that 134 examiners travelled to attend a meeting in London.

Distance (km)	Number of examiners
41–45	4
46–50	19
51–60	53
61–70	37
71–90	15
91–150	6

(*a*) Give a reason to justify the use of a histogram to represent these data. **(1)**

(*b*) Calculate the frequency densities needed to draw a histogram for these data. **(2)**
(DO NOT DRAW THE HISTOGRAM)

(*c*) Use interpolation to estimate the median Q_2, the lower quartile Q_1, and the upper quartile Q_3 of these data. **(4)**

The mid-point of each class is represented by x and the corresponding frequency by f. Calculations then give the following values

$$\sum fx = 8379.5 \quad \text{and} \quad \sum fx^2 = 557489.75$$

(*d*) Calculate an estimate of the mean and an estimate of the standard deviation for these data. **(4)**

June 05 Q2

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3. Keith records the amount of rainfall, in mm, at his school, each day for a week. The results are given below.

$$2.8 \quad 5.6 \quad 2.3 \quad 9.4 \quad 0.0 \quad 0.5 \quad 1.8$$

Jenny then records the amount of rainfall, x mm, at the school each day for the following 21 days. The results for the 21 days are summarised below.

$$\sum x = 84.6$$

(*a*) Calculate the mean amount of rainfall during the whole 28 days. **(2)**

Keith realises that he has transposed two of his figures. The number 9.4 should have been 4.9 and the number 0.5 should have been 5.0.

Keith corrects these figures.

(*b*) State, giving your reason, the effect this will have on the mean. **(2)**

Jan 11 Q2

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4. Sunita and Shelley talk to each other 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

The mid-point 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)**

During the following 25 weeks they monitored their weekly conversation 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)**

(*d*) Comment on these two mean values. **(2)**

June 06 Q2