2. As part of an investigation, Bobby collects a sample of 47 observations, x

The results are shown in the following stem and leaf diagram, where a is a constant.

Stem	Leaf										
2	1	2	5	7	7						(5)
3	0	2	2	3	4	5	5	5	9	9	(10)
4	0	0	1	4	4	5	7	8	8	9	9 (11)
5	3	3	5	6	7	9					(6)
6	0	2	a	a	a	7	8				(7)
7	1	2	3	6	8						(5)
8	0	6	7								(3)

Key: 3 | 2 means 0.32

(a) Find the range of these observations.

(1)

(b) Find the value of the median of these observations.

(1)

Given that the interquartile range of these observations is 0.31

(c) find the value of a

(3)

Bobby calculates the following statistics from these observations

$$\sum x = 23.72 \qquad \sum x^2 = 13.4228$$

(d) Show that the standard deviation of these observations is 0.176 to 3 significant figures.

(2)

Bobby now collects 18 more observations, y, from the same investigation.

(e) Using all 65 observations, the sample mean is 0.502 and the sample standard deviation is 0.204

(i) Show that $\sum y = 8.91$

(2)

(ii) Showing your working, calculate $\sum y^2$

(3)

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Question 2 continued

(Total for Question 2 is 12 marks)