Exercise 1.4 –Standard Deviation and Variance/ Measure of Spread

1 *Do not use the statistical functions on your calculator for part (i) of this question.*

(i) For each of the following sets of numbers, calculate the mean and the standard deviation.

(a) 2, 4, 5, 6, 8 (b) 6, 8, 9, 11

(c) 11, 14, 17, 23, 29 (d) 5, 13, 7, 9, 16, 15

(e) 4.6, 2.7, 3.1, 0.5, 6.2 (f) 200, 203, 206, 207, 209

(ii) Now check your answers using your calculator in statistical mode.

2 The stem-and-leaf diagram shows the times taken by 10 people to run a race.

Stem	Leaf
12	8
13	4 6 6 8
14	7 9
15	0 7
16	4

Key: 12 | 8 means 12.8 seconds

Calculate the mean and standard deviation of the times.

3 *Do this question without using the statistical functions on your calculator and then check using the statistical mode.*

x	10	11	12	13
f	3	7	11	2

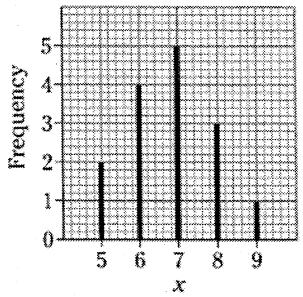
Calculate the mean and standard deviation.

4 The score for a round of golf for each of 50 club members was recorded and the results are summarised in the frequency table.

Score, x	66	67	68	69	70	71	72	73
Frequency, f	2	5	10	12	9	6	4	2

Calculate the mean score and the standard deviation.

5 A vertical line graph for a set of data is shown below.



Calculate the mean and standard deviation of the data.

6 A group of 20 people play a game. The table shows the frequencies of their scores.

Score	1	2	4	x
Frequency	2	5	7	6

The mean score is 5.

(i) Find x.

(ii) Calculate the standard deviation.

7 Becky plays a computer game where she fires at a target. Her score is 1 if she hits the target and 0 if she misses it.

She has 30 attempts and hits the target 18 times.

(i) Find her mean score for the 30 attempts.

(ii) Find the variance of her scores for the 30 attempts.

8 The floor areas, $x\,\text{m}^2$, of 105 houses in a housing development are as follows:

Floor area ($x\,\text{m}^2$)	$50 \leqslant x < 150$	$150 \leqslant x < 200$	$200 \leqslant x < 250$	$250 \leqslant x < 350$	$350 \leqslant x < 500$
Frequency	20	29	36	15	5

Calculate estimates of the mean and standard deviation of the floor areas.

9 The scores of 60 candidates in an intelligence test are shown in the table.

Score	100–106	107–113	114–120	121–127	128–134
Frequency	8	13	24	11	4

Calculate estimates of the mean score and the standard deviation.

10 A survey is carried out to determine the numbers of pupils in various age groups attending nurseries, schools and colleges in a certain region. The results are summarised in the table.

Age, x years	$3 \leqslant x < 5$	$5 \leqslant x < 7$	$7 \leqslant x < 11$	$11 \leqslant x < 16$	$16 \leqslant x < 18$
Frequency	58	127	350	567	398

Calculate estimates of the mean age and the standard deviation.

11 A school librarian noted the number of books borrowed from the library during a month by the pupils in a particular year group. The results are summarised in the table.

Number of books	0–2	3–5	6–10	11–15
Number of pupils	21	54	22	13

(i) State the class boundaries of the first group.

(ii) Calculate estimates of the mean and standard deviation.

13 Thirty-one people completed a jigsaw in the following times (x minutes).

11	53	72	48	48	49	39	87	73	23	120	24	61	36	66	67
86	79	65	47	36	133	78	81	70	75	53	42	42	72	144	

(i) Calculate the mean $\bar{x}$.

(ii) Calculate the standard deviation, s.d.