Exercise 1.3 – Mean/Measure of Central Tendency

1 Find the mean of each of these sets of numbers without using the statistical mode on your calculator. Then check using the statistical mode.

(i) 5, 6, 6, 8, 8, 9, 11, 13, 14, 17

(ii) 148, 153, 156, 157, 160

(iii) 44, 47, 48, 51, 52, 54, 55, 56

(iv) 1769, 1771, 1772, 1775, 1778, 1781, 1784

(v) 0.85, 0.88, 0.89, 0.93, 0.94, 0.96

(vi)

x	1	2	3	4	5	6	7
f	4	5	8	10	17	5	1

(vii)

x	27	28	29	30	31	32
f	30	43	51	49	42	35

2 Find the mean of the data represented in this stem-and-leaf diagram.

1	2 8
2	1 4 4 6
3	0 0 2 3 5 5 5
4	2 3 6 7
5	3 6 9

Key: 1 \| 2 means 12 grams

3 The age distribution of the population of a small village is recorded in the table.

Age	Number of people
$0 < x < 15$	54
$15 \leqslant x < 30$	78
$30 \leqslant x < 50$	120
$50 \leqslant x < 70$	88
$70 \leqslant x < 100$	60

Estimate the mean age.

4 A stock check was carried out on the number of books on a section of shelves in a library.

Number of books on shelf	Number of shelves
31–35	4
36–40	6
41–45	10
46–50	13
51–55	5
56–60	2

(i) State the mid-interval value of the first interval.

(ii) Estimate the mean number of books on a shelf.

5 The height, to the nearest metre, was recorded of each of the 215 birch trees in a wood. The heights are summarised in the frequency table.

Height (m)	5–9	10–12	13–15	16–18	19–28
Frequency	30	43	51	49	42

Estimate the mean height of the birch trees in the wood.

6 In a busy office, the duration of time the telephone rang before it was answered was noted for 105 calls. The times were recorded in seconds, to the nearest second. The results are summarised in the table.

Time (to the nearest second)	Number of calls
10–19	20
20–24	20
25–29	15
30–31	14
32–34	16
35–39	10
40–59	10

(i) Estimate the mean time before a telephone call was answered.

(ii) What is the modal class?

7 The frequency distribution shows the marks achieved in a test by 100 students.

Test mark	30–39	40–49	50–59	60–69	70–79	80–99
Frequency	10	14	26	20	18	12

Estimate the mean mark.

8 The mean of this frequency distribution is 3.66.

x	1	2	3	4	5	6
f	3	9	a	11	8	7

Find a.

9 The lengths, in metres, of the gardens of the houses in a particular street are represented in the following table.

Length (m)	$10 \leqslant x < 16$	$16 \leqslant x < 20$	$20 \leqslant x < 40$	$40 \leqslant x < 50$
Frequency	4	12	f	8

An estimate of the mean length is 27.7 m.

(i) Find f.

(ii) How many houses are there in the street?

10 A bag contained five balls each bearing a different number: 1, 2, 3, 4 or 5. A ball was drawn from the bag, its number was noted, and then it was put back in the bag. This was done 50 times in all and the table below shows the resulting frequency distribution.

Number	1	2	3	4	5
Frequency	x	11	y	8	9

The mean of this frequency distribution is 2.7. Find x and y.

11 The mean of ten numbers is 8. When an eleventh number is included, the mean is 9. What is the value of the eleventh number?

12 The mean of a list of 8 numbers is 15. When two more numbers, x and $2x$, are added to the list, the mean is 13.2. Find x.

13 The mean of four numbers is 5, and the mean of three different numbers is 12. What is the mean of the seven numbers?

14 The mean of n numbers is 5. If the number 13 is included with the n numbers, the new mean is 6. Find n.