

1 Two way tables

At a concert, men : women = 9 : 11. 70% of the 200 people stand, as do three fifths of the women.

- a) Complete the table.
b) What fraction of the people sitting are men?

	Standing	Sitting	Total
Men	74	16	90
Women	66	44	110
Total	140	60	200

$$b) \frac{16}{60} = \frac{4}{15}$$

2 Averages and range

The mean of x , $2x$, $3x + 1$ and 10 is 8.

- a) Find x and the median of the four numbers.
b) Each number is doubled, then 3 is added. Find the new mean and range.

$$a) 6x + 11 = 32, x = 3.5$$

$$3.5, 7, 10, 11.5: \text{median } 8.5$$

$$b) \text{mean } 2 \times 8 + 3 = 19, \text{range } 2 \times 8 = 16$$

3 Averages and range

The mean of n numbers is 12. When 30 is added to the list, the mean is 13.

- a) Find n .
b) Then one number is taken away, and the mean of the 17 left is 12.5. Which number was taken away?

$$a) 12n + 30 = 13(n + 1), n = 17$$

$$b) 18 \times 13 - 17 \times 12.5 = 234 - 212.5 = 21.5$$

4 Choosing the best average

A player's points in nine games are
0, 0, 0, 14, 16, 17, 18, 19, 21

- a) Find the mean, median and mode.
b) Which average best shows a typical game? Why are the other two poor?

$$a) \text{mean } 11.7, \text{median } 16, \text{mode } 0$$

$$b) \text{the median: the mode is } 0, \text{ and the three } 0\text{s} \\ \text{drag the mean below every other score}$$

Collecting data, averages and range

revision mat answers

5 Mean from a frequency table

The number of pets owned by some students.
The mean is 1.25

- a) Find x .
b) Find the median number of pets.

Pets	0	1	2	3
Frequency	8	x	10	4

$$a) x + 32 = 1.25(22 + x), 0.25x = 4.5, x = 18$$

$$b) 40 \text{ students: the } 20\text{th and } 21\text{st are } 1$$

6 Estimated mean: grouped data

An estimate of the mean of these times is 22 minutes.

- a) Find x .
b) Estimate the percentage of the times over 25 minutes, to 1 decimal place.

Time, t (min)	$0 < t \leq 10$	$10 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 50$
Frequency	4	10	x	6

$$a) 410 + 25x = 22(20 + x), 3x = 30, x = 10$$

$$b) 5 + 6 = 11, 11 \div 30 = 36.7\%$$

7 Estimating from a sample

Two random samples of the 1200 students at a school were asked if they walk to school.

- a) Estimate how many of the 1200 walk, from each sample.
b) Use both samples together to make a better estimate.

	Asked	Walk
Sample A	80	28
Sample B	120	39

$$a) A: 15 \times 28 = 420, B: 10 \times 39 = 390$$

$$b) 67 \div 200 \times 1200 = 402$$

8 Estimating from a sample

A random sample of 150 of the 6000 homes in a town: 54 have a garden, and $\frac{2}{3}$ of those have a lawn.

- a) Estimate how many homes in the town have a lawn.
b) A second survey asks 150 people who live in flats. Explain why its estimate would be biased.

$$a) 54 \times \frac{2}{3} = 36, 36 \times 40 = 1440$$

$$b) \text{flats seldom have gardens, so the sample is} \\ \text{not typical of the town}$$