



## Analysing data (2)

- Estimating the mean of grouped continuous data
- Identifying the modal class of grouped data
- Realising that the mean of grouped data is often very close to the mean of the raw data

Keywords

You should know

explanation 1a

explanation 1b

**1 a** These are the playing times in minutes of tracks on two of Finn's CDs.

4.17   2.78   1.63   4.02   16.52   4.67   2.05   4.67   5.33   6.50  
5.97   9.78   8.77   17.55   6.80   4.12   6.90   3.72   5.25   7.85

Find the following times in minutes and seconds.

- i** The mean playing time
  - ii** The median playing time
  - iii** The range of the playing time
  - iv** The modal playing time
- b** Finn decides to group the data and constructs this grouped frequency table.

Time (mins)	Frequency
$0.00 \leq T < 4.00$	
$4.00 \leq T < 8.00$	
$8.00 \leq T < 12.00$	
$12.00 \leq T < 16.00$	
$16.00 \leq T < 20.00$	

$0.00 \leq T < 4.00$   
represents times  
from 0 minutes  
up to, but not  
including 4 minutes.

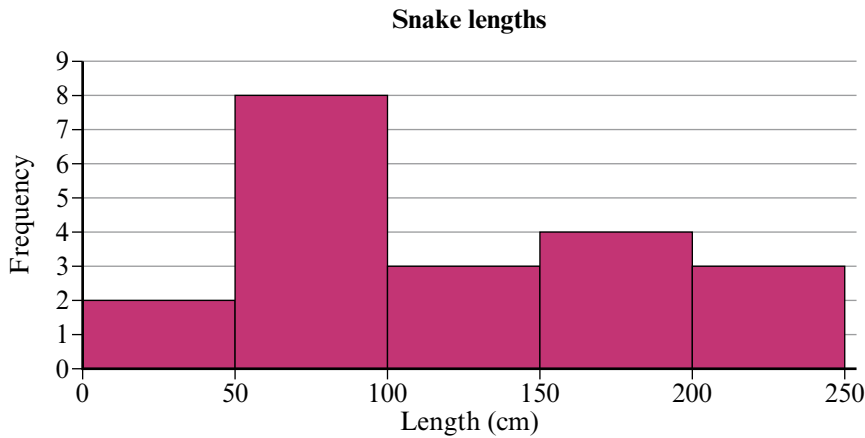
Copy and complete the grouped frequency table.

- c** Finn then gives the grouped frequency data to a friend, who decides to analyse the grouped data.

Use the grouped data to find these times in minutes and seconds.

- i** The estimated mean playing time
  - ii** The modal group
- d** Comment on any similarities and/or differences in the results from parts **a** and **c**.

**2** The grouped frequency diagram, shows the lengths of 20 snakes at a snake farm.



- a** What is the mid-interval value of the group  $50 \leq L < 100$ ?
- b** Copy and complete this grouped frequency table. Add extra rows for the intervals  $150 \leq L < 200$  and  $200 \leq L < 250$ .

Length (cm)	Mid-interval value	Frequency
$0 \leq L < 50$		
$50 \leq L < 100$		
$100 \leq L < 150$		

- c** What is the modal group?
- d** Estimate the mean length of the snakes at the farm.

**3** Isabel had a project to research the average playing time of films at her local cinema. Over a 4-week period she recorded the duration of all the films that the cinema played. These are the times in minutes.

138 131 158 125 117 114 140 118 94  
138 121 91 120 115 129 105 125 149

- a** Calculate the following times in minutes and seconds.
- i** the mean duration
  - ii** the median duration
  - iii** the modal duration
  - iv** the range of the film durations
- b** Isabel then decides to group her data. Using a class interval of 10 minutes, construct and complete an appropriate grouped frequency table.
- c** Use the grouped data to find these times in minutes and seconds.
- i** The estimated mean duration
  - ii** The modal group

- 4** Ryan lives in Cambridge. One summer he decides to visit 15 of his friends in different cities around the UK. The cities and their distances by road from Cambridge are given in the table.



City	Distance from Cambridge (km)
London	98
Portsmouth	216
Cardiff	326
Manchester	258
Sheffield	197
Glasgow	566
Nottingham	139
Liverpool	309
Newcastle-upon-Tyne	369
Edinburgh	536
Exeter	401
Perth	599
Birmingham	155
Leeds	237
Blackpool	366

- a** Use this data to find the following distances.
- The mean distance from Cambridge
  - The median distance from Cambridge
  - The modal distance from Cambridge
  - The range of the distances
- b** Construct an appropriate grouped frequency table for this data.
- c** Use your grouped data to find these distances.
- The estimated mean distance from Cambridge
  - The modal group
- d** Comment on any similarities and/or differences in your answers to parts **a** and **c**.