b Estimate the mean by grouping the data into:
i intervals 0-4, 5-9, 10-14, etc. **ii** intervals 0-8, 9-16, 17-24, 25-30.

c Comment on your answers from **a** and **b**.

4 The table shows the length of newborn babies at a hospital over a one week period.
Find the approximate mean length of the newborn babies.

Length (mm)	*frequency*
400 to 424	2
425 to 449	7
450 to 474	15
475 to 499	31
500 to 524	27
525 to 549	12
550 to 574	4
575 to 599	1

5 The table shows the petrol sales in one day by a number of city service stations.

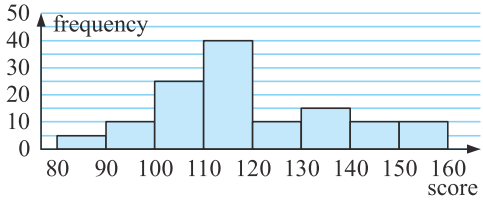
a How many service stations were involved in the survey?

b Estimate the total amount of petrol sold for the day by the service stations.

c Find the approximate mean sales of petrol for the day.

Thousands of litres (l)	*frequency*
2000 to 2999	4
3000 to 3999	4
4000 to 4999	9
5000 to 5999	14
6000 to 6999	23
7000 to 7999	16

6 This histogram illustrates the results of an aptitude test given to a group of people seeking positions in a company.



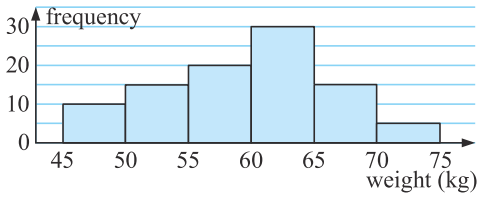
a How many people sat for the test?

b Find an estimate of the mean score for the test.

c What fraction of the people scored less than 100 for the test?

d If the top 20% of the people are offered positions in the company, estimate the minimum mark required.

7



The histogram shows the weights (in kg) of a group of year 10 students at a country high school.

a How many students were involved in the survey?

b Calculate the mean weight of the students.

c How many students weigh less than 56 kg?

d What percentage of students weigh between 50 and 60 kg?

e If a student was selected at random, what would be the chance that the student weighed less than 60 kg?

EXERCISE 18C

1 Calculate the median of the following distributions:

a

score	1	2	3	4	5	6
frequency	25	11	8	5	4	1

b

score	5	6	7	8	9	10
frequency	1	3	11	12	8	2

2 This table indicates the number of errors in randomly chosen pages of a telephone directory:

number of errors	0	1	2	3	4	5	6
frequency	67	35	17	8	11	2	1

Find the median number of errors.

3 The following data shows the lengths of 30 trout caught in a lake during a fishing competition. Measurements are to the nearest centimetre.

31 38 34 40 24 33 30 36 38 32 35 32 36 27 35
40 34 37 44 38 36 34 33 31 38 35 36 33 33 28

a Construct a cumulative frequency table for trout lengths, x cm, using the following intervals $24 \leqslant x < 27$, $27 \leqslant x < 30$, ... etc.

b Draw a cumulative frequency graph.

c Use **b** to find the median length.

d Use the original data to find its median and compare your answer with **c**. Comment!

4 In an examination the following scores were achieved by a group of students:

Draw a cumulative frequency graph of the data and use it to find:

a the median examination mark

b how many students scored less than 65 marks

c how many students scored between 50 and 70 marks

d how many students failed, given that the pass mark was 45

e the credit mark, given that the top 16% of students were awarded credits.

score	*frequency*
$10 \leqslant x < 20$	2
$20 \leqslant x < 30$	5
$30 \leqslant x < 40$	7
$40 \leqslant x < 50$	21
$50 \leqslant x < 60$	36
$60 \leqslant x < 70$	40
$70 \leqslant x < 80$	27
$80 \leqslant x < 90$	9
$90 \leqslant x < 100$	3

5 The following frequency distribution was obtained by asking 50 randomly selected people the size of their shoes.

shoe size	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9	$9\frac{1}{2}$	10
frequency	1	1	0	3	5	13	17	7	2	0	1

Draw a cumulative frequency graph of the data and use it to find:

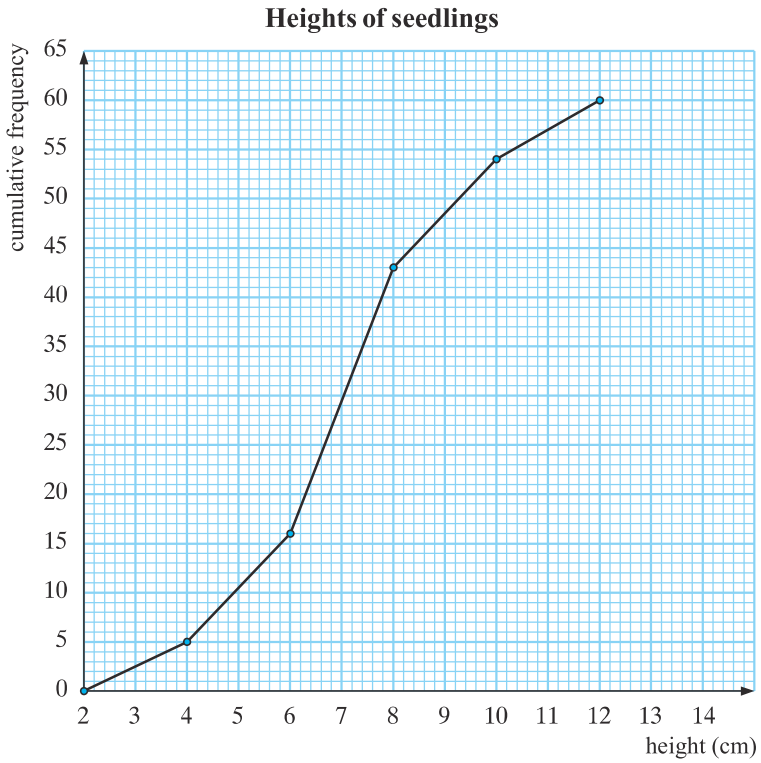
a the median shoe size

b how many people had a shoe size of:

i $7\frac{1}{2}$ or more

ii 8 or less.

8 A botanist has measured the heights of 60 seedlings and has presented her findings on the cumulative frequency graph below.



a How many seedlings have heights of 5 cm or less?

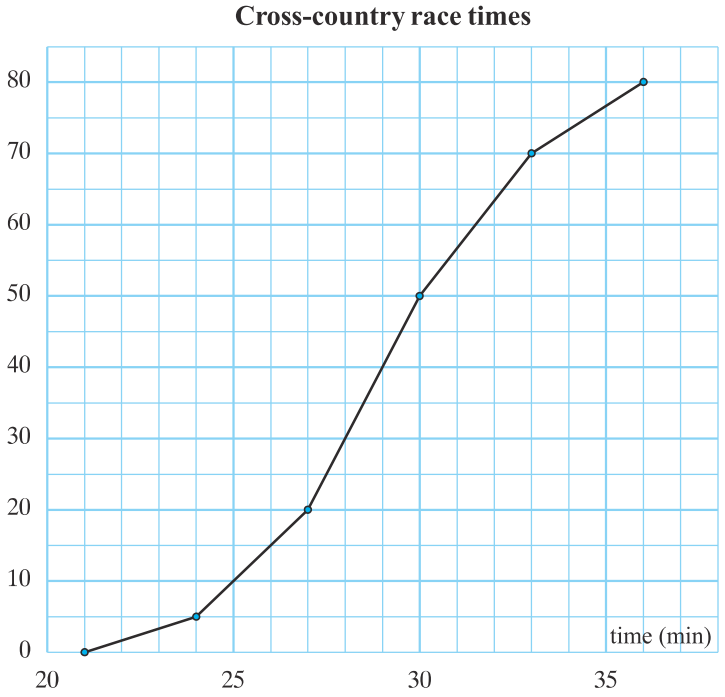
b What percentage of seedlings are taller than 8 cm?

c What is the median height?

d What is the interquartile range for the heights?

e Find the 90th percentile for the data and explain what your answer means.

9 The following cumulative frequency graph displays the performance of 80 competitors in a cross-country race.



Find:

a the lower quartile time

b the median

c the upper quartile

d the interquartile range

e an estimate of the 40th percentile.