Name:

Exam Style Questions

Cumulative Frequency
Box Plots

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents
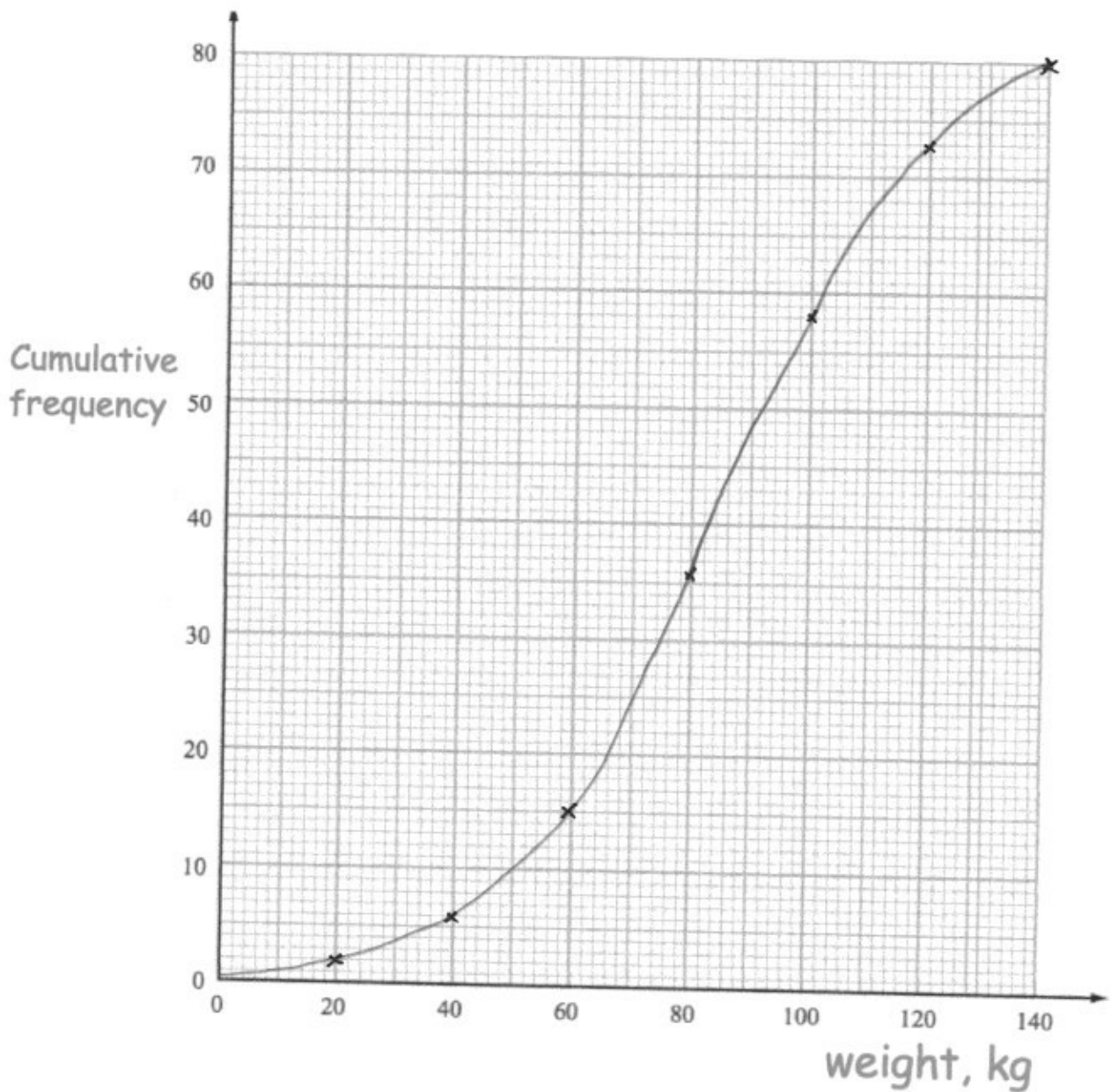
Video 149

Video 150

Video 153

Video 154

1. The weight of 80 deer was recorded by a zoo keeper.
   The table below shows this information.

Weight, w kg	Cumulative frequency
0 < w ≤ 20	2
0 < w ≤ 40	6
0 < w ≤ 60	15
0 < w ≤ 80	36
0 < w ≤ 100	58
0 < w ≤ 120	73
0 < w ≤ 140	80

Draw a cumulative frequency graph for this information.

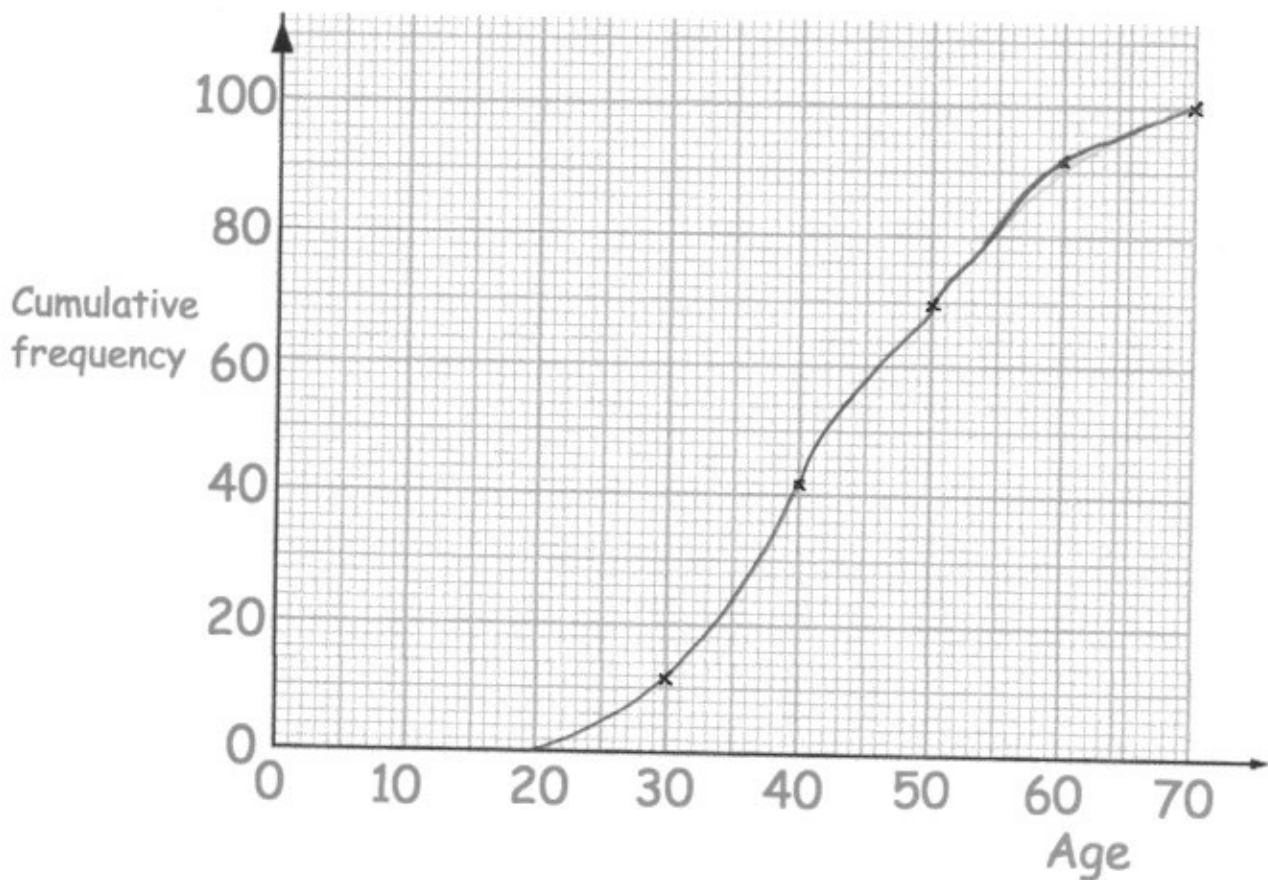(2)

2. The ages of 100 teachers were recorded.
    The table below shows this information.

Age, x years	Frequency	Cumulative frequency
20 < x ≤ 30	12	12
30 < x ≤ 40	30	42
40 < x ≤ 50	28	70
50 < x ≤ 60	22	92
60 < x ≤ 70	8	100

(a) Complete the cumulative frequency column in the table.

(1)

(b) Draw a cumulative frequency graph for this information.

(2)

3. The table shows information about the number of hours that 260 students spent revising for an exam.

Number of hours (h)	Frequency
0<h≤2	20
2<h≤4	32
4<h≤6	48
6<h≤8	120
8<h≤10	24
10<h≤12	16

(a) Complete the cumulative frequency table.

Number of hours (h)	Cumulative frequency
0<h≤2	20
0<h≤4	52
0<h≤6	100
0<h≤8	220
0<h≤10	244
0<h≤12	260

(1)

(b) On the grid on the following page, draw a cumulative frequency graph for your table.

(2)

(c) Use your graph to find an estimate for the median number of hours spent revising.

_____6·8_____hours

(1)

(d) Use your graph to find an estimate for the number of students who spent **less** than 3 hours revising.

_____34_____
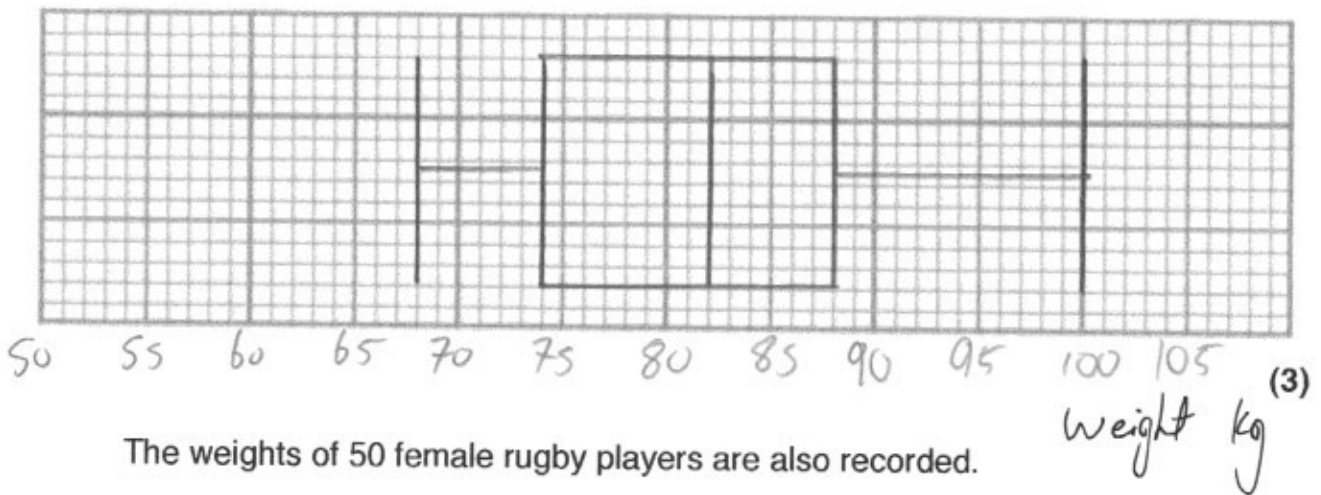
(2)

4. The table gives information about the weights of 50 male rugby players.

Lowest	68kg
Lower Quartile	74kg
Median	82kg
Upper Quartile	88kg
Highest	100kg

$IQR = 14kg$

$range = 32kg$

(a) Draw a box plot to show this information.

50 55 60 65 70 75 80 85 90 95 100 105

weight kg

(3)

The weights of 50 female rugby players are also recorded.

The lightest female rugby player is 51kg.
The lower quartile is 60kg.
The median is 71kg.
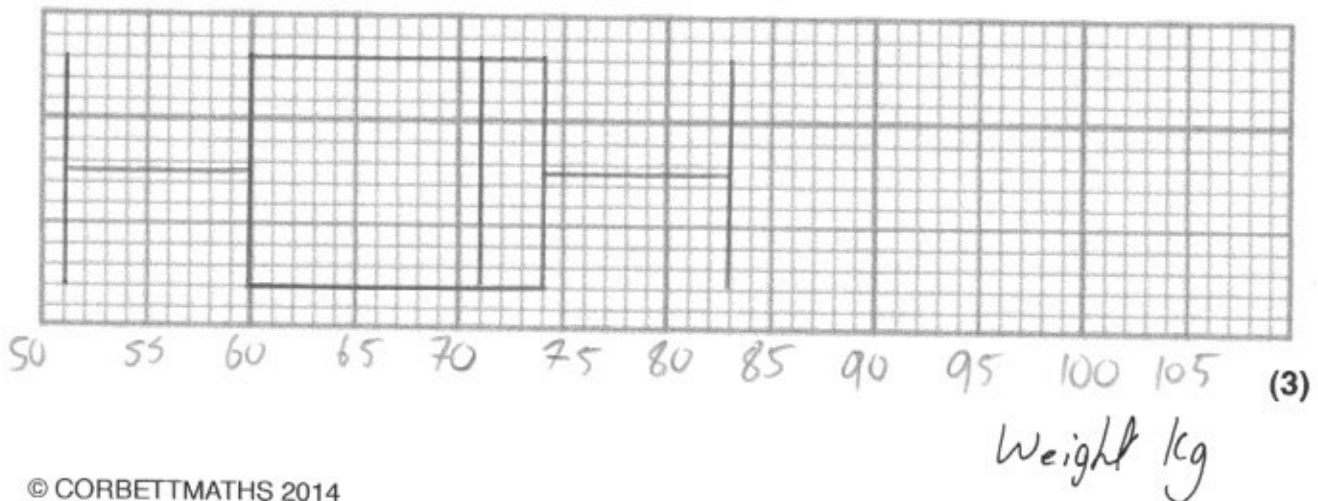
UQ 74kg

The range and interquartile range for the female rugby players is the same as the male rugby players.

highest 83kg

(b) Draw a box plot to show this information.

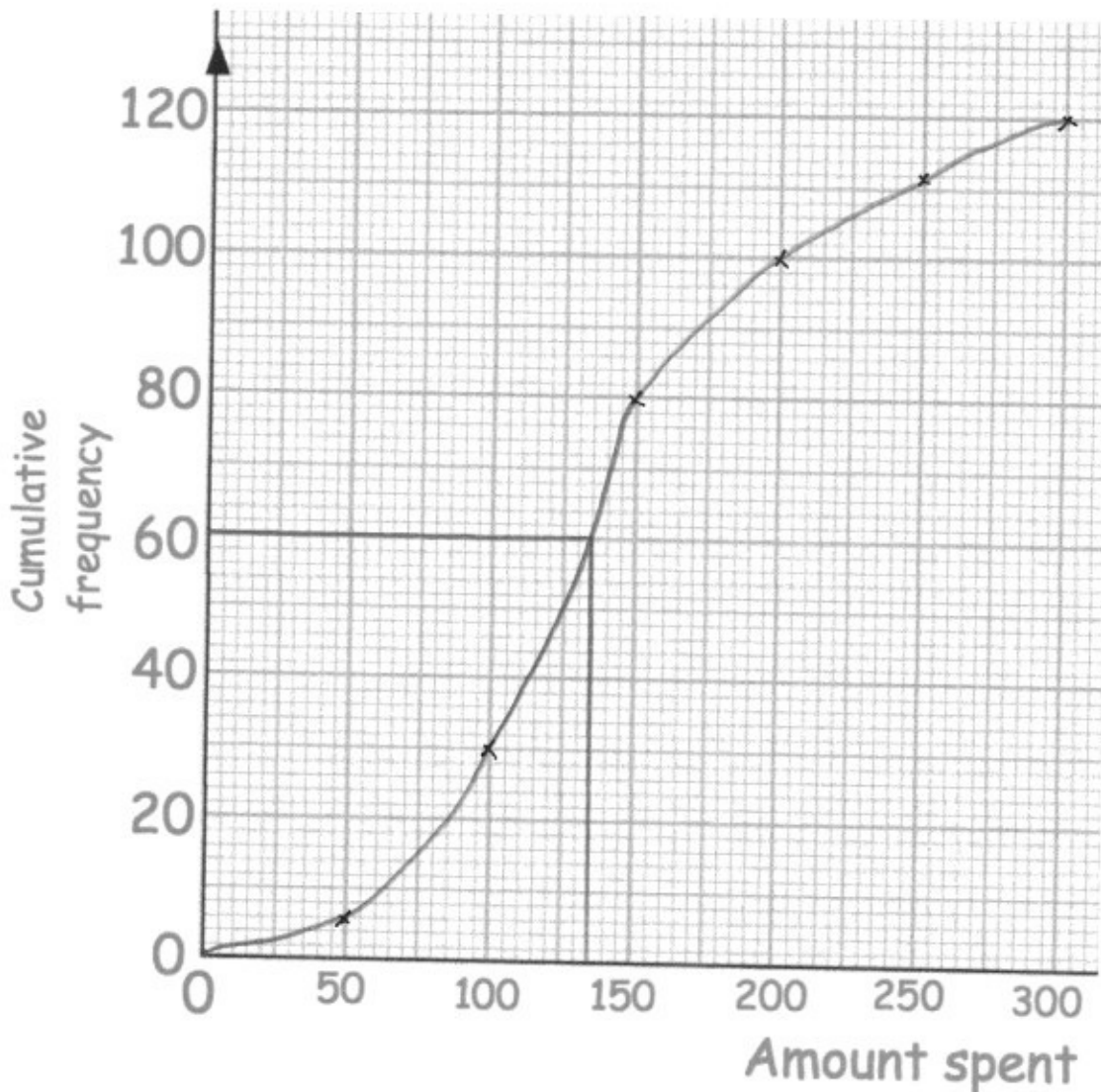50 55 60 65 70 75 80 85 90 95 100 105

(3)

Weight kg

5. John did a survey about the amounts of money spent by 120 women while Christmas shopping.

The cumulative frequency table shows this information.

Amount spent, £x	Cumulative frequency
0 < x ≤ 50	6
0 < x ≤ 100	30
0 < x ≤ 150	80
0 < x ≤ 200	100
0 < x ≤ 250	112
0 < x ≤ 300	120

(a) On the grid, draw a cumulative frequency diagram.

(2)

(b) Use the cumulative frequency diagram to estimate the median.
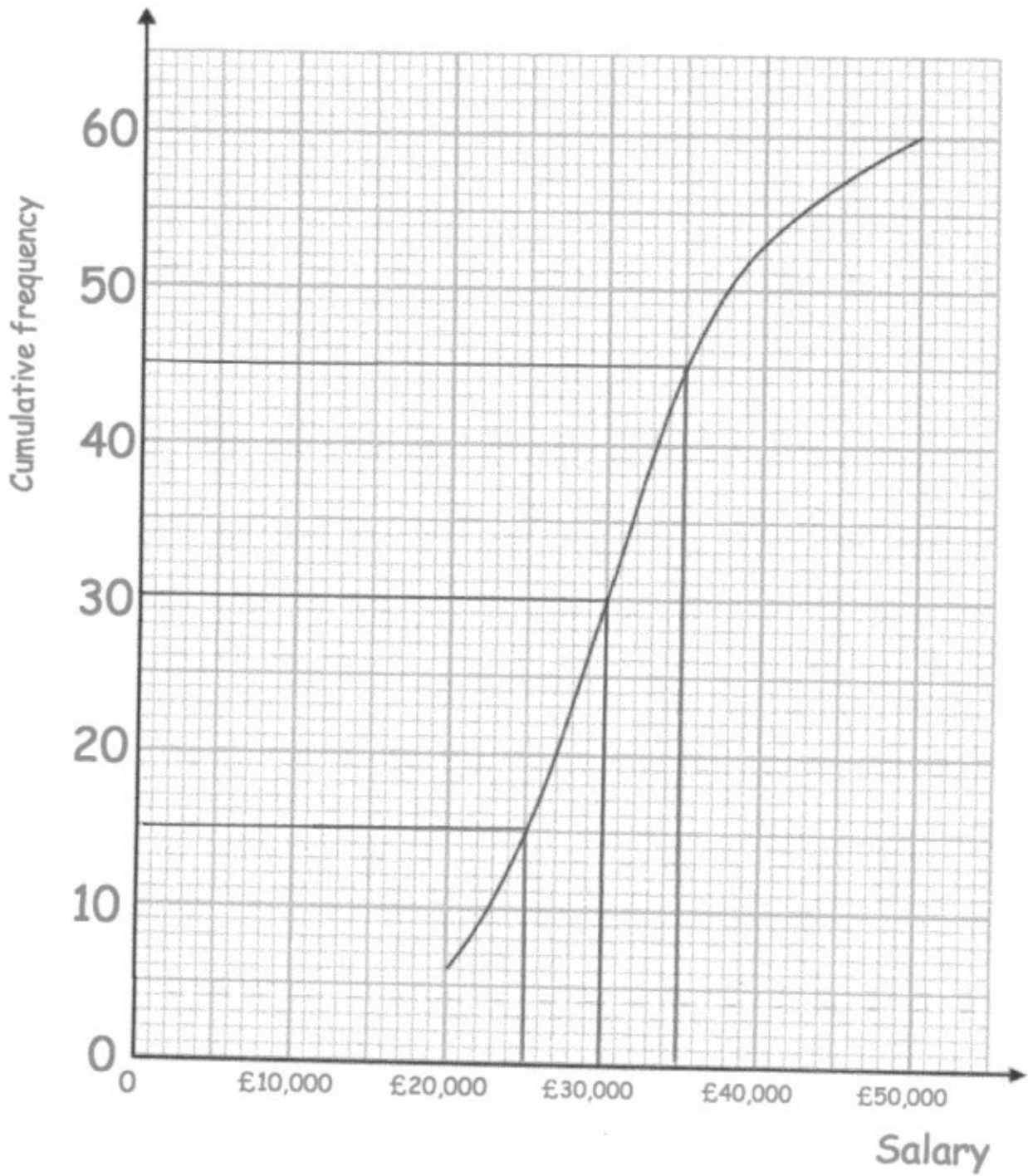
£ 135

(2)

John then surveyed men about the amount of money they spent while Christmas shopping. The median was £160.

(c) Compare the amounts of money spent by the women with the amounts of money spent by the men.

The men spent more than the woman, with a medium of £160 compared to £135

(1)

6. A university surveyed 60 mathematics graduates on their starting salary.
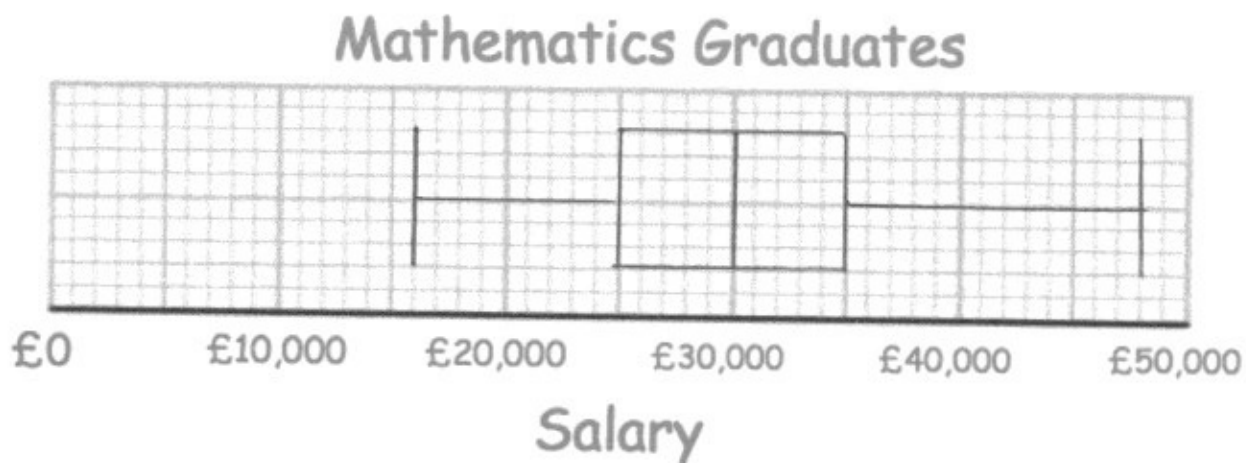The cumulative frequency graph shows some information about the salaries.

(a) Use the graph to find an estimate for the median salary.

£ 30000

(1)
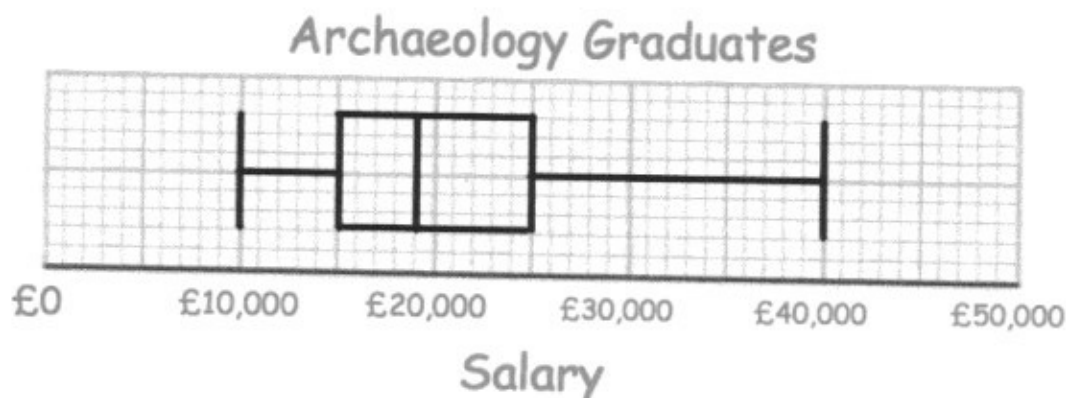
The 60 mathematics graduates
        had a minimum salary of £16,000
        and a maximum salary of £48,000.

(b) Use this information and the cumulative frequency curve to draw a box plot
    for the 60 mathematics graduates.

Mathematics Graduates

£0   £10,000   £20,000   £30,000   £40,000   £50,000

Salary

(3)

The university also surveyed 60 archaeology graduates.
The box plot below shows information about their salaries.

Archaeology Graduates

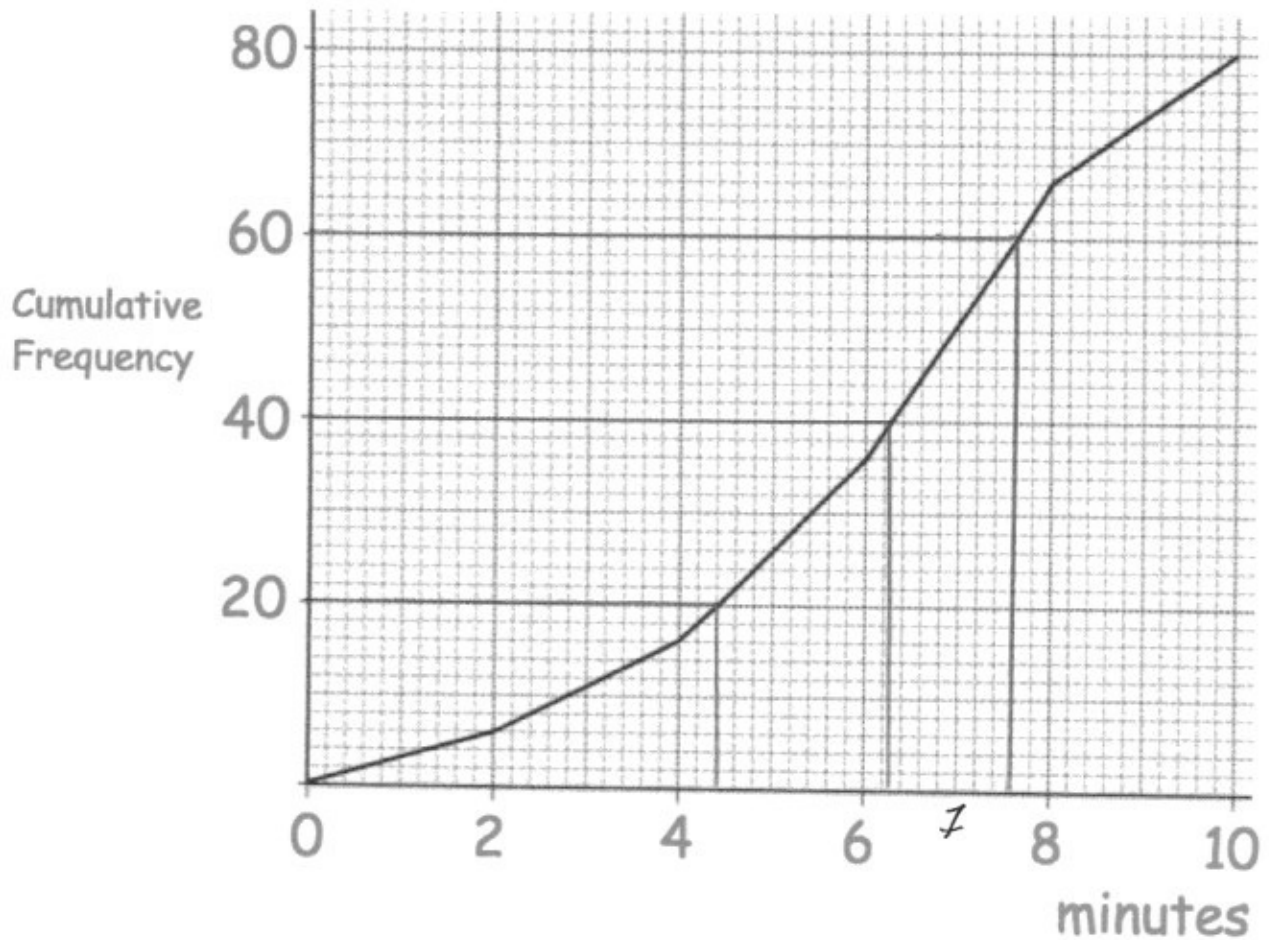£0   £10,000   £20,000   £30,000   £40,000   £50,000

Salary

(c) Compare the distribution of the salaries of the mathematics graduates with
    the distribution of the salaries of the archaeology graduates.

The salaries are similarly spread, both with interquartile ranges
of £10,000. The mathematics graduates clearly earn more,
with a median of £30,000 compared to £19,000

(2)

7. The length of time, in minutes, that 80 customers spend in a shop was recorded. A cumulative frequency diagram of this data is below.
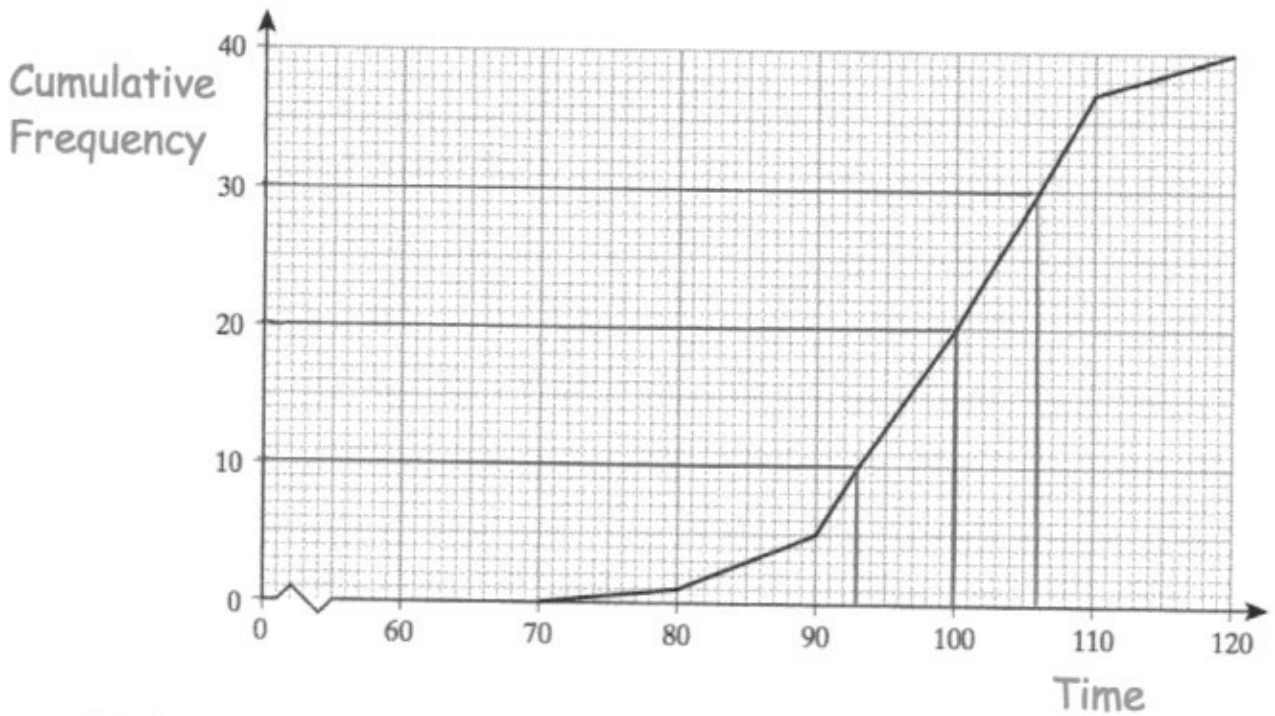

(a) Find an estimate of the median.

........6.3........minutes

(1)

(b) Find an estimate of the inter-quartile range.

7.6 − 4.4

........3.2........minutes

(2)

8. 40 students complete a puzzle.
    The time taken, in seconds, is recorded.
    The cumulative frequency diagram shows the information about the times taken.
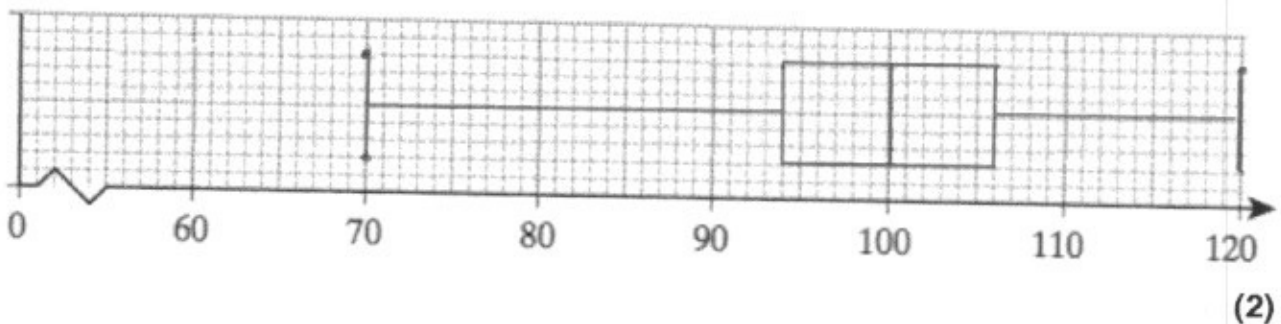

(a) Find the median time taken.

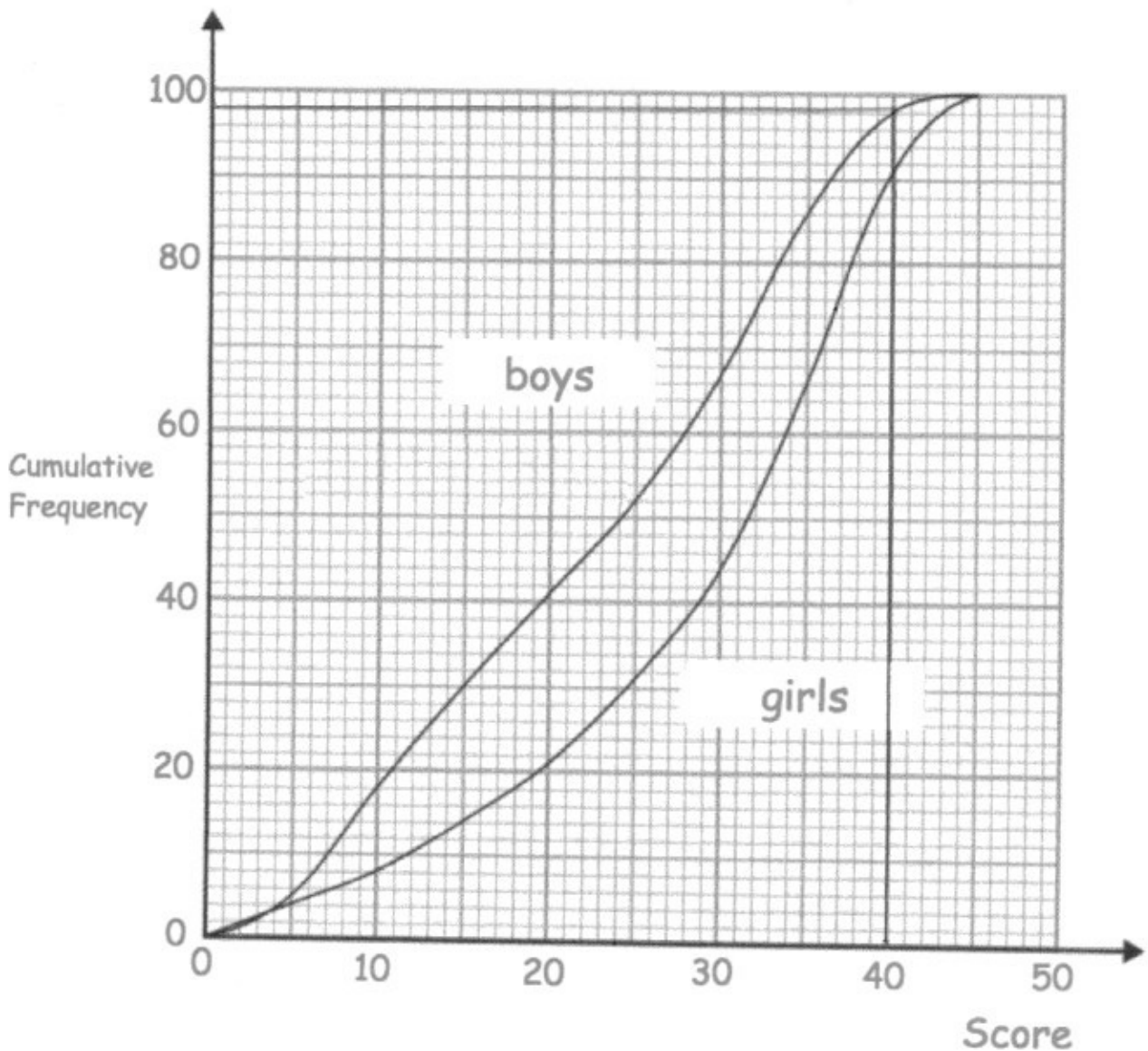........100......seconds

(1)

(b) Find the inter-quartile range.

106 - 94

12

...........................seconds

(2)

(c) Complete a box plot for times taken.

(2)

9. A teacher gave 100 boys and 100 girls a maths test.
    The test was out of 45 marks.
    The cumulative frequency curves show how each group performed.

(a) Find an estimate for the number of boys who scored over 40 marks.

boys   girls
2 4   ✓31.5 median
19   14.5   IQR

.... 2 ....

(1)

(b) Make two comparisons between the distributions of the boys and girls scores.

The girls scored more than the boys on average, with
a median of 31.5 compared to 24.

The boys results are more spread out (less consistent)
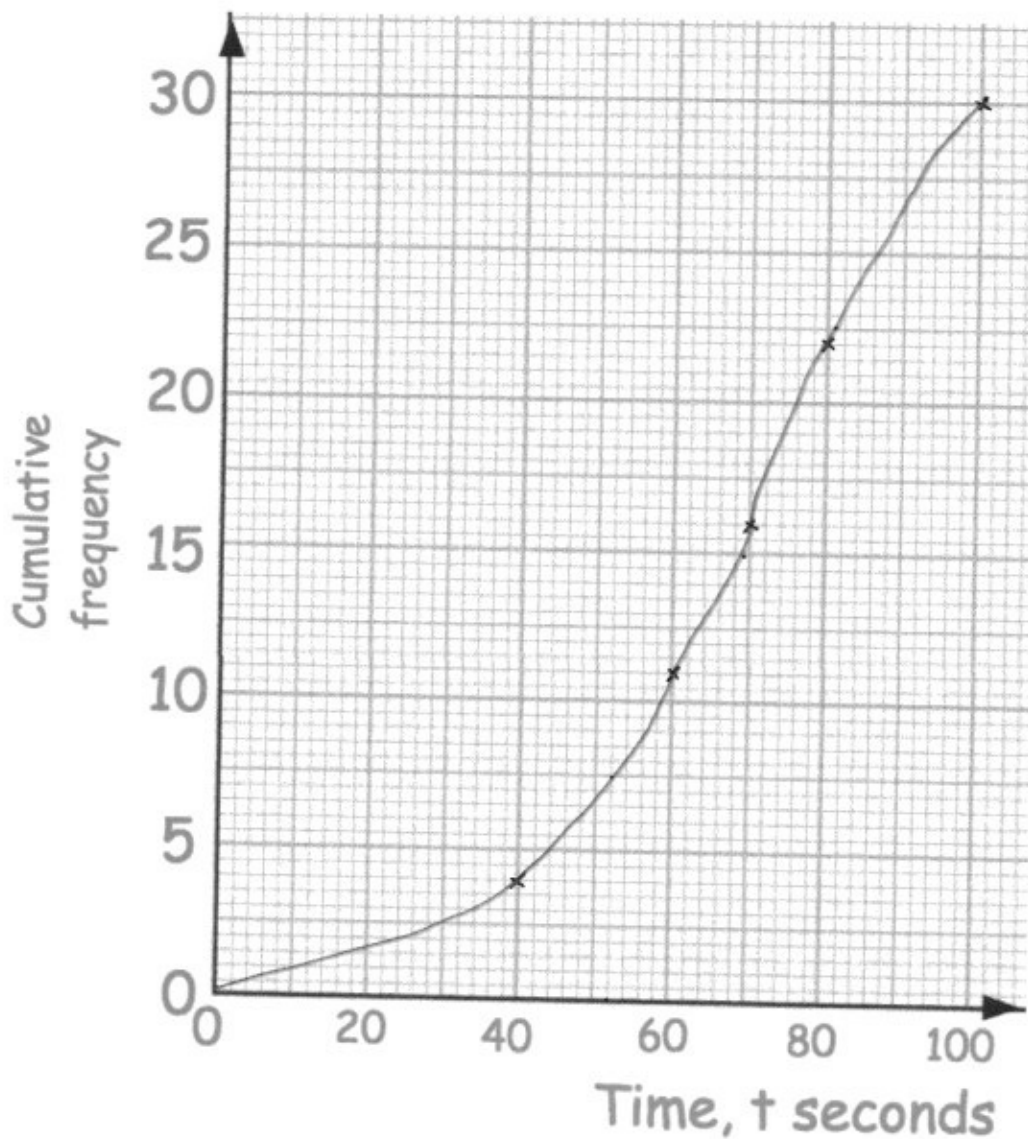as their IQR is 19 compared to 14.5.

(3)

10. A group of primary school students run an obstacle course.

The table below shows some information about their times.

Time, (t)	Cumulative frequency
0< t ≤ 40	4
0< t ≤ 60	11
0< t ≤ 70	16
0< t ≤ 80	22
0< t ≤ 100	30

(a) On the grid, draw a cumulative frequency graph for this information.

Median = 69

IQR =

81 - 52
= 29

Time, t seconds

(2)

A group of secondary school students did the same obstacle course.
Their median time was 72 seconds and interquartile range was 34 seconds.

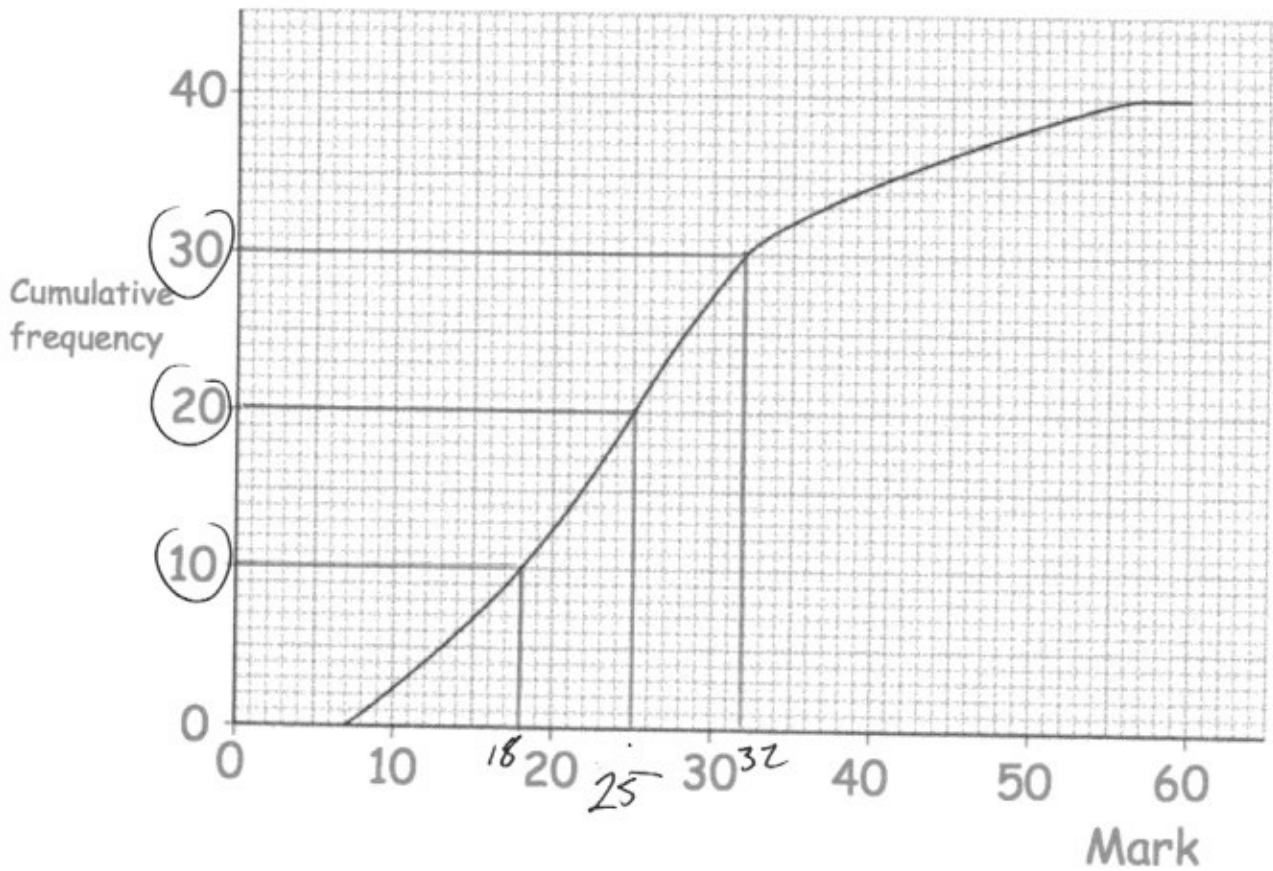(b) Compare the times taken of these two groups of students.

The primary school students were slightly quicker
with a median of 69 seconds compared to 72.

The primary school student times were less
spread out (more consistent) as their interquartile
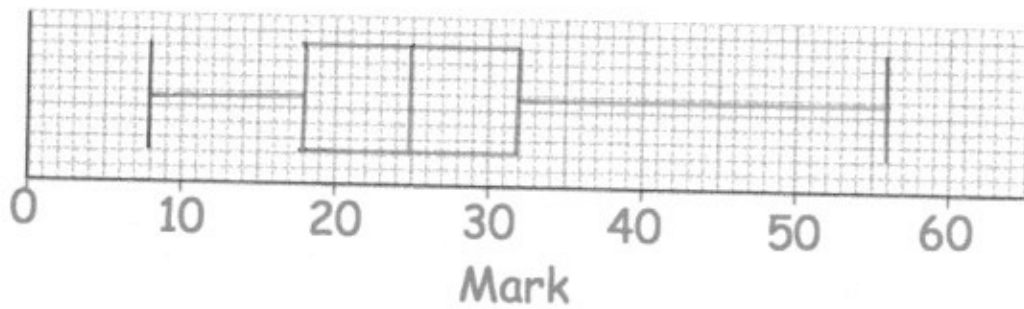range was ~~34~~ 29 seconds, compared to 34.

(5)

11. The cumulative frequency diagram below shows the distribution of marks in an Art exam.

The lowest mark is 8.
The highest mark is 56.

(a) Draw a box plot for this data.

(b) What percentage of students scored more than the upper quartile mark?

25 %

(1)

12. Mrs Davis sets her class a quiz, which has a maximum score of 50.
The distribution of the scores are shown in a box plot below.

(a) Write down the median score.

30

(1)

(b) Write down the highest score.

48

(1)

(c) Find the interquartile range.

$$35 - 19$$

16

(2)

Martin scored 35 marks.
(d) What percentage of the class scored a lower mark than Martin?
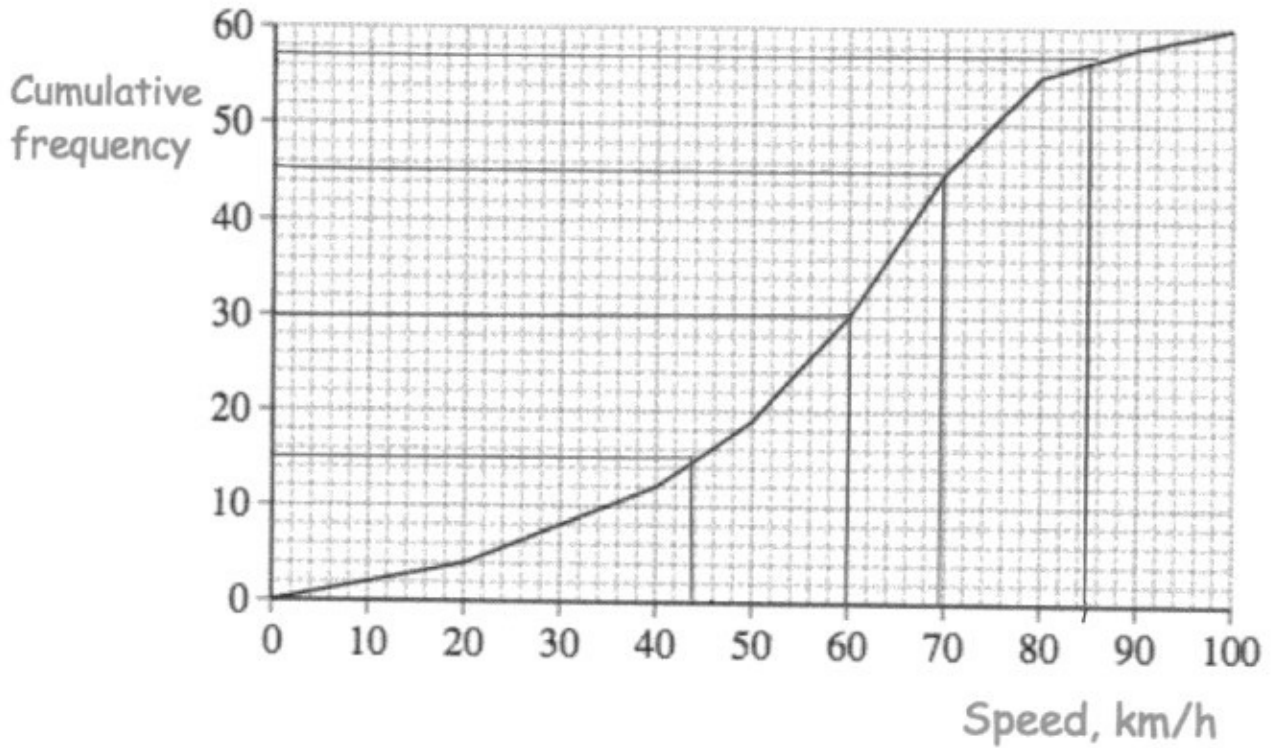
75 %

(1)

The interquartile range is a better measure of the spread of a distribution than the range.

Explain why.

One outlier will affect the range but not the interquartile range.

(1)

13. The cumulative frequency diagram shows the distribution of speeds for 60 cars on a road.

(a) Estimate the median speed.

60 km/h

(1)

(b) Estimate the interquartile range of the speeds.

$70 - 44$

26 km/h

(2)

The speed limit on the road is 85 km/h.

(c) How many cars exceeded the speed limit?

$60 - 57$

3

(2)