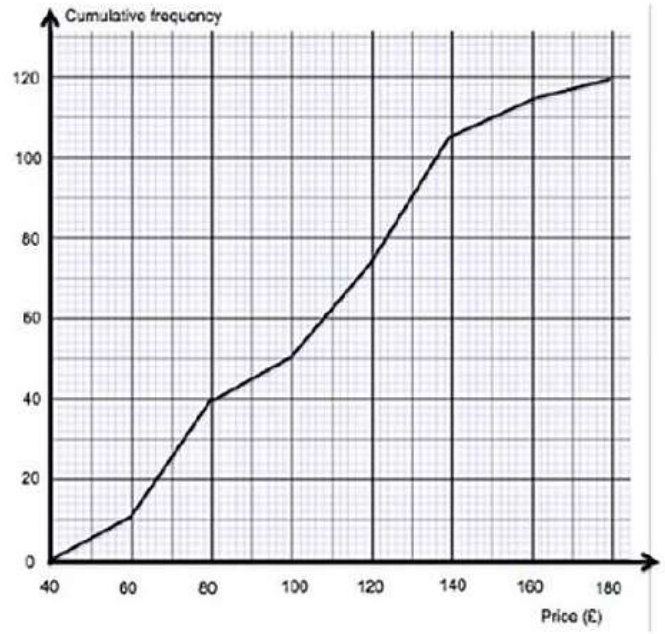
Higher Numeracy Sample 1 P1 Q2b

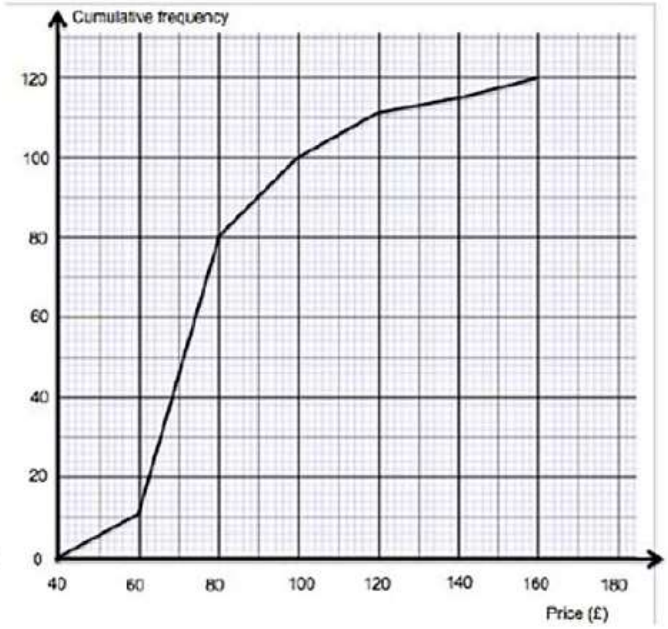
(b) Before agreeing to improve the hotel's swimming pool, the manager of the *Hafod Hotel* decides to check the price of a double room for a night, in hotels with and without swimming pools.

She has grouped her results, 120 hotels with a swimming pool and 120 hotels without a swimming pool.

Prices for double rooms at hotels with a swimming pool



Prices for double rooms at hotels without a swimming pool



(i) The *Hafod Hotel* owners look at the manager's findings and ask:

> How many more hotels have double rooms that are priced at more than £140 per night in hotels with swimming pools than in hotels without swimming pools?

What response should the manager give?
You must show all your working. [2]

(ii) To help decide whether or not to improve the *Hafod Hotel's* swimming pool, the manager's findings need to be interpreted.

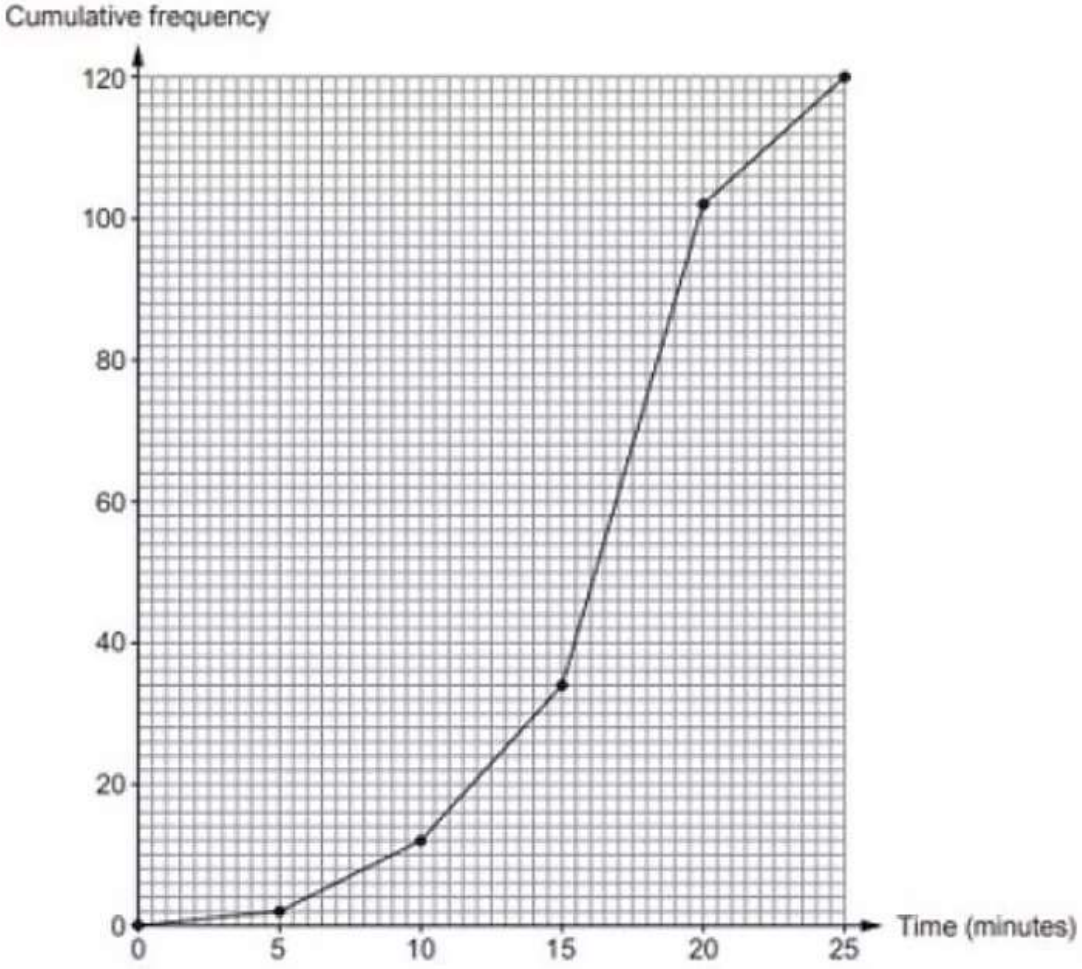
Describe the difference in the distribution of prices for a double room in hotels with a swimming pool compared with those without a swimming pool.

You must use an appropriate average and measure of spread and interpret your findings. [4]

Higher Numeracy Nov 2017 P1 Q3

Meirion is a window cleaner.
From Monday to Friday, he records how long he spends cleaning windows for each of his customers.

He draws a cumulative frequency diagram to display the findings.



(a) (i) Use Meirion's cumulative frequency diagram to find the median and interquartile range of the times he spends cleaning windows for each of his customers. [3]

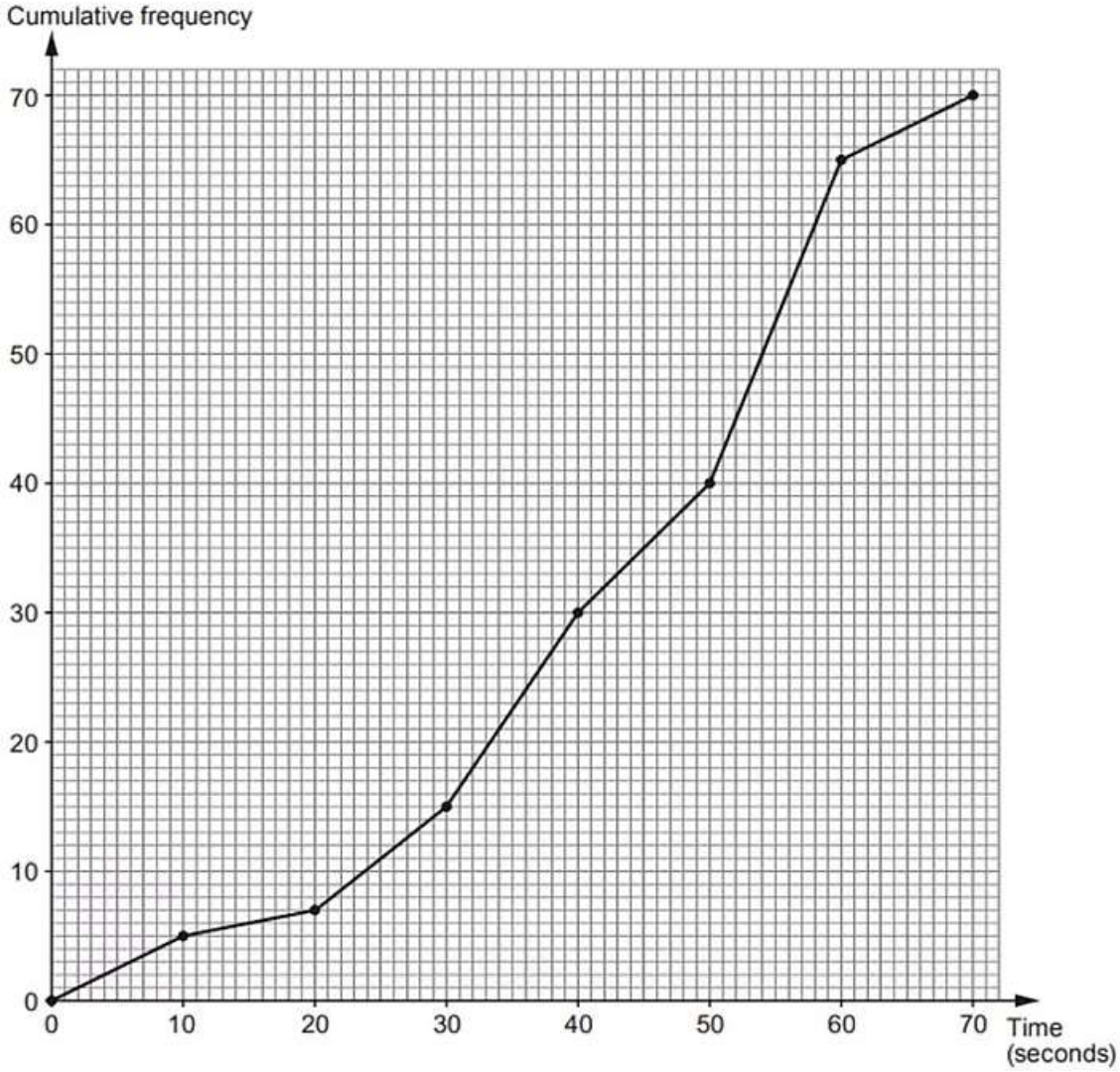
(ii) Meirion looks back at his raw data.
He finds that the median is actually 17 minutes 30 seconds.
Why is there a difference between the median from his cumulative frequency diagram and the actual median from his raw data? [1]

(b) Meirion is looking at the time it took to clean individual customers' windows.
Find the number of customers whose windows took between 10 and 15 minutes to clean. [2]

(c) Meirion thinks that for approximately 80% of his customers, he cleaned their windows in less than 20 minutes.
Is Meirion correct?
You must show all your working. [3]

Higher Numeracy Summer 2017 P1 Q5

Cambria Airlines has planes that can carry up to 70 passengers.
For safety, the crew practise the emergency exit procedures with a group of 70 passengers.
Every 10 seconds the safety officer records the total number of passengers who have left the plane.
He has displayed the results in the cumulative frequency diagram shown below.



(a) Estimate the median time taken by the passengers to leave the plane. [1]

(b) How many passengers took more than 50 seconds to leave the plane?
Circle your answer. [1]

10 20 30 40 50

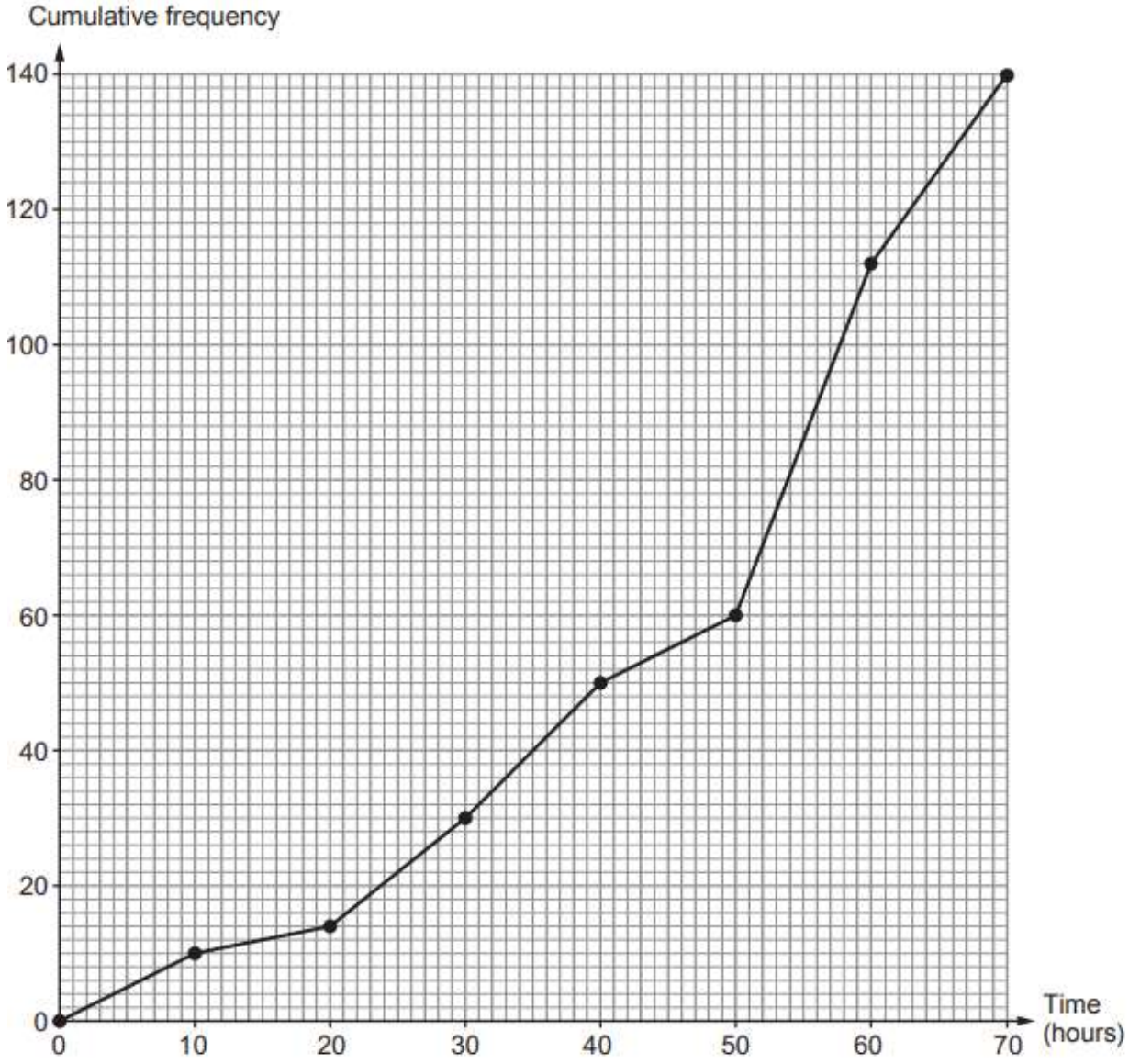
(c) *Cambria Airlines* has a policy that states the following.

'In the event of an emergency exit procedure, at least 90% of the 70 passengers must have left the plane within 1 minute.'

Did the practice emergency exit procedure meet the requirements of the airline's policy?
You must show all your working. [4]

Higher Numeracy Nov 2016 P1 Q4

(a) 140 girls were asked how long they spent revising for their GCSE examinations. The cumulative frequency diagram shows the results.



(i) Estimate the median time the girls spent revising.
Circle your answer. [1]

35 hours 40 hours 48 hours 52 hours 70 hours

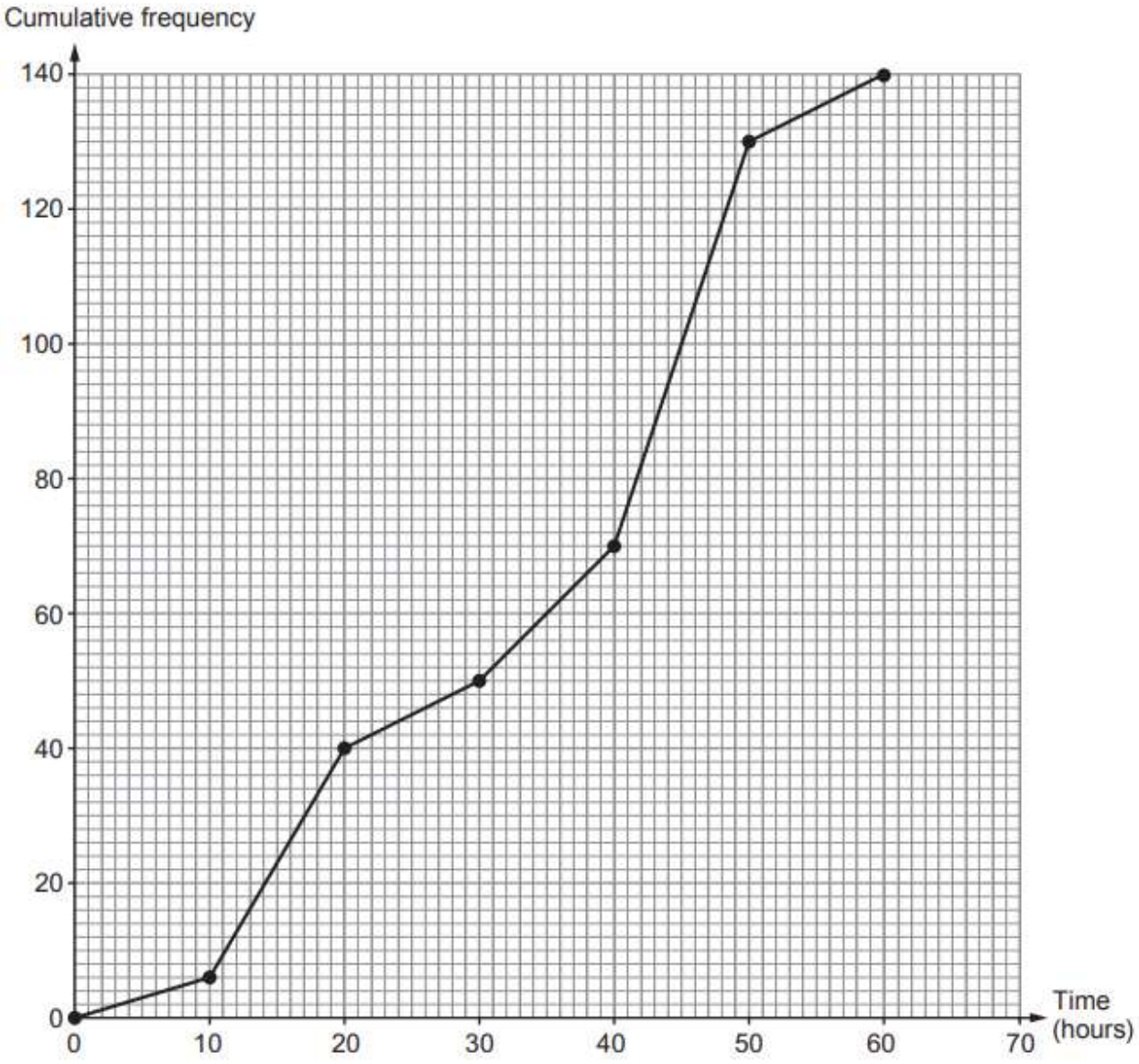
(ii) Calculate the number of girls who spent between 40 and 50 hours revising.
Circle your answer. [1]

0 girls 5 girls 10 girls 15 girls 20 girls

(iii) Circle either TRUE or FALSE for each of the following statements. [2]

25 girls spent between 30 and 50 hours revising.	TRUE	FALSE
No girls spent more than 80 hours revising.	TRUE	FALSE
The modal group is between 50 and 60 hours spent revising.	TRUE	FALSE
20 girls spent more than 60 hours revising.	TRUE	FALSE

(b) 140 boys were asked how long they spent revising for their GCSE examinations. The cumulative frequency diagram below shows the results.



Trefor makes two statements.

1. The boys' interquartile range is greater than the girls' interquartile range.

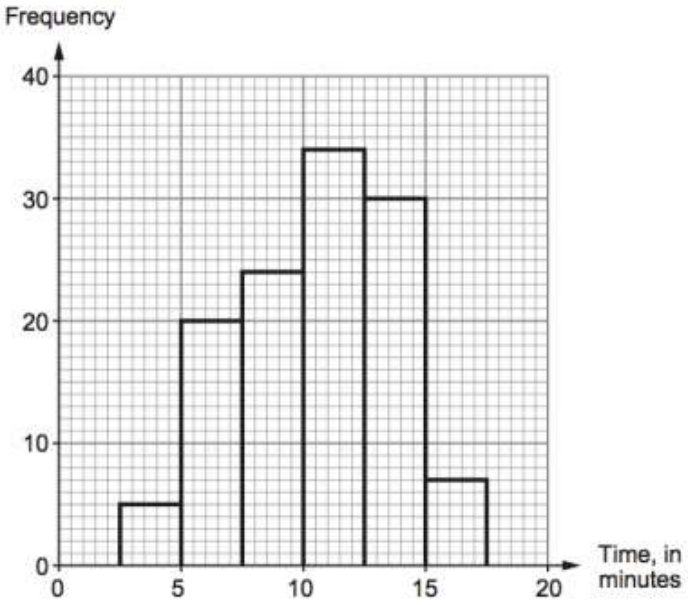
2. On average, boys spent more time revising.

Are both Trefor's statements correct?
Show calculations and give reasons to support your answers. [4]

Higher Numeracy Sample 2 P2 Q5

In Aberfar, a group of local people took part in a challenge to learn how to tie a Celtic knot.

The frequency diagram shows the times taken by the local people to tie a Celtic knot for the first time.



(a) Complete the cumulative frequency table for the times taken by the local people to tie a Celtic knot for the first time.

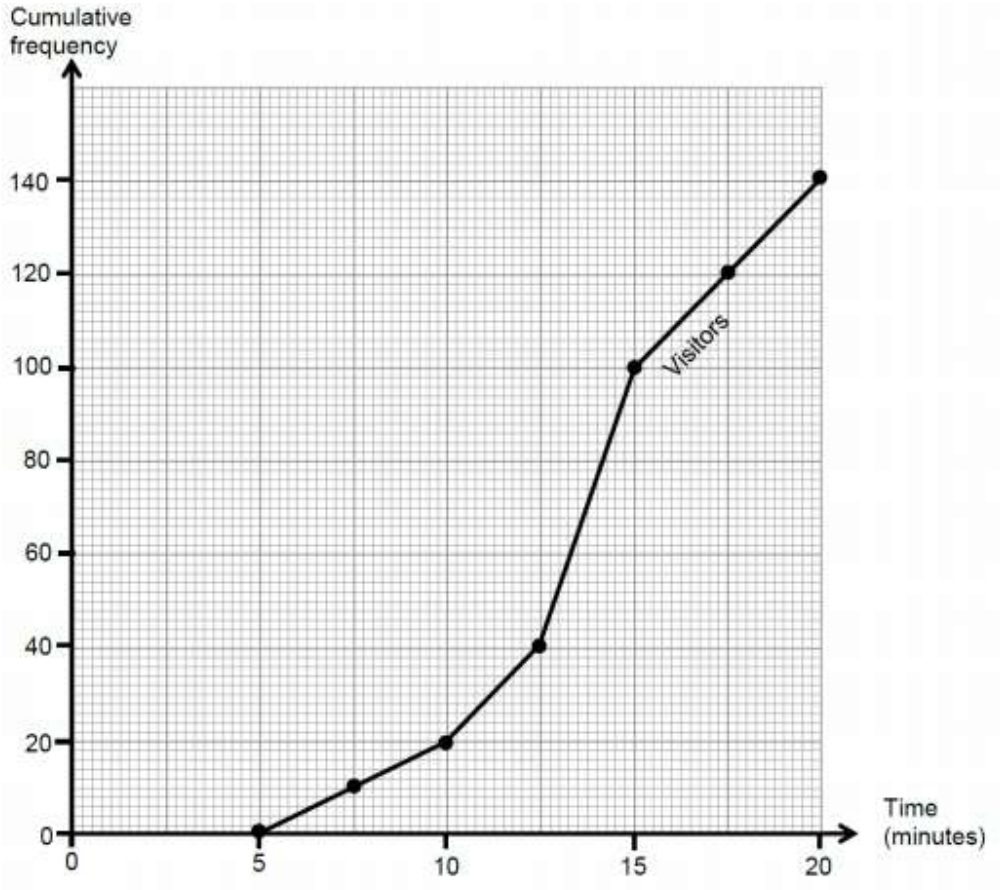
[2]

Time, t in minutes	$t \leq 2{\cdot}5$	$t \leq 5$	$t \leq 7{\cdot}5$	$t \leq 10$	$t \leq 12{\cdot}5$	$t \leq 15$	$t \leq 17{\cdot}5$
Cumulative frequency							

(b) The graph paper opposite shows a cumulative frequency diagram of the times taken by 140 visitors to Wales to tie a Celtic knot for the first time.

On the same graph, draw a cumulative frequency diagram for the times taken by the local people to tie a Celtic knot for the first time.

[2]



(c) The visitors had been set a target that 100 of the group would finish within $17\frac{1}{2}$ minutes.

Did they miss the target or beat the target? .....

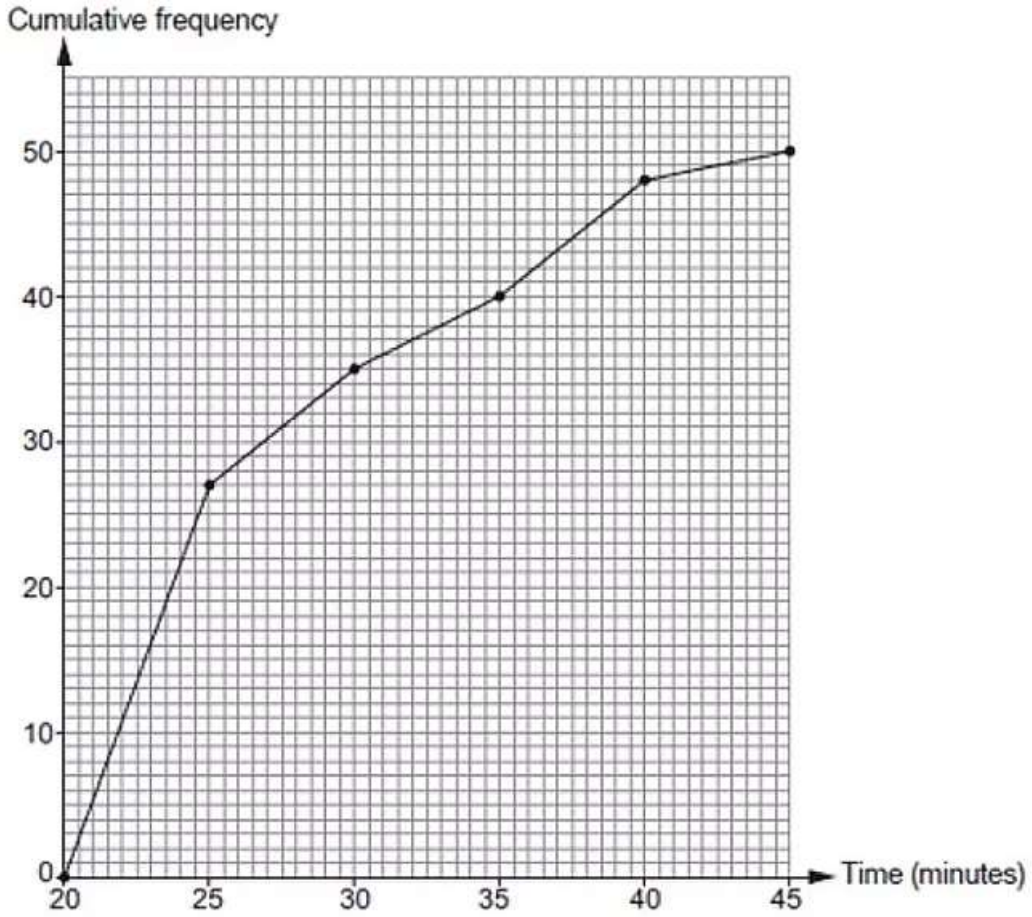
By how many minutes? .....

[2]

Higher Numeracy Summer 2018 P1 Q6

This year, 50 runners took part in a 5 km race in the Brecon Beacons.
All 50 runners finished the race.

The cumulative frequency diagram below shows the times taken by the runners to finish the race.



(a) Which is the modal group?
Circle your answer. [1]

20 to 25 minutes 25 to 30 minutes 30 to 35 minutes

35 to 40 minutes 40 to 45 minutes

(b) Is it certain that the last runner's finish time was 45 minutes?
You must give a reason for your answer. [1]

Yes ☐ No ☐

(c) The organisers hoped that 80% of the runners would finish the race within 30 minutes.

Complete the following two statements. [2]

'..... % of runners finished the race within 30 minutes.'

'80% of runners finished the race within ..... minutes.'

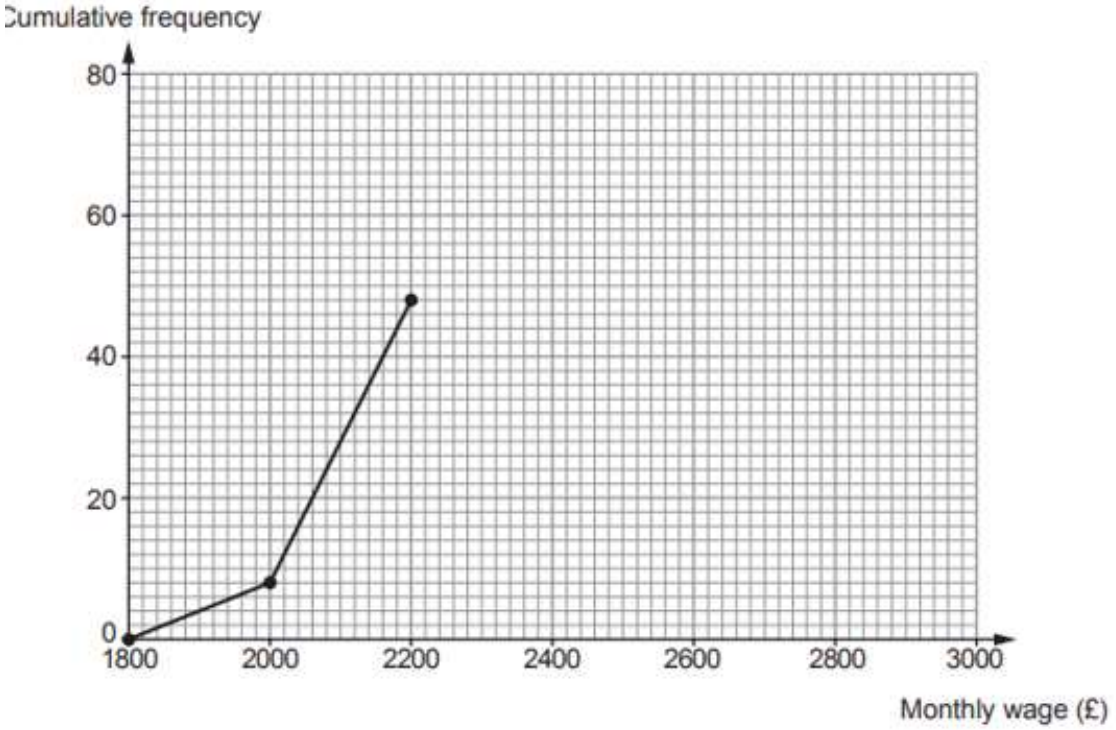
(d) Last year, the median finish time was 26 minutes.
By how many minutes was the median time better this year?
You must show all your working. [2]

Higher Summer 2019 P2 Q5b

(b) *Maesteg Electrical* also specialises in wiring new houses.
The monthly wages of all *Maesteg Electrical* employees are summarised in the frequency table below.

Monthly wage, £x	Frequency
$1800 \leqslant x < 2000$	8
$2000 \leqslant x < 2200$	40
$2200 \leqslant x < 2400$	24
$2400 \leqslant x < 3000$	8

(i) Use the frequency table to complete the following cumulative frequency diagram to display the monthly wages of all *Maesteg Electrical* employees. [2]



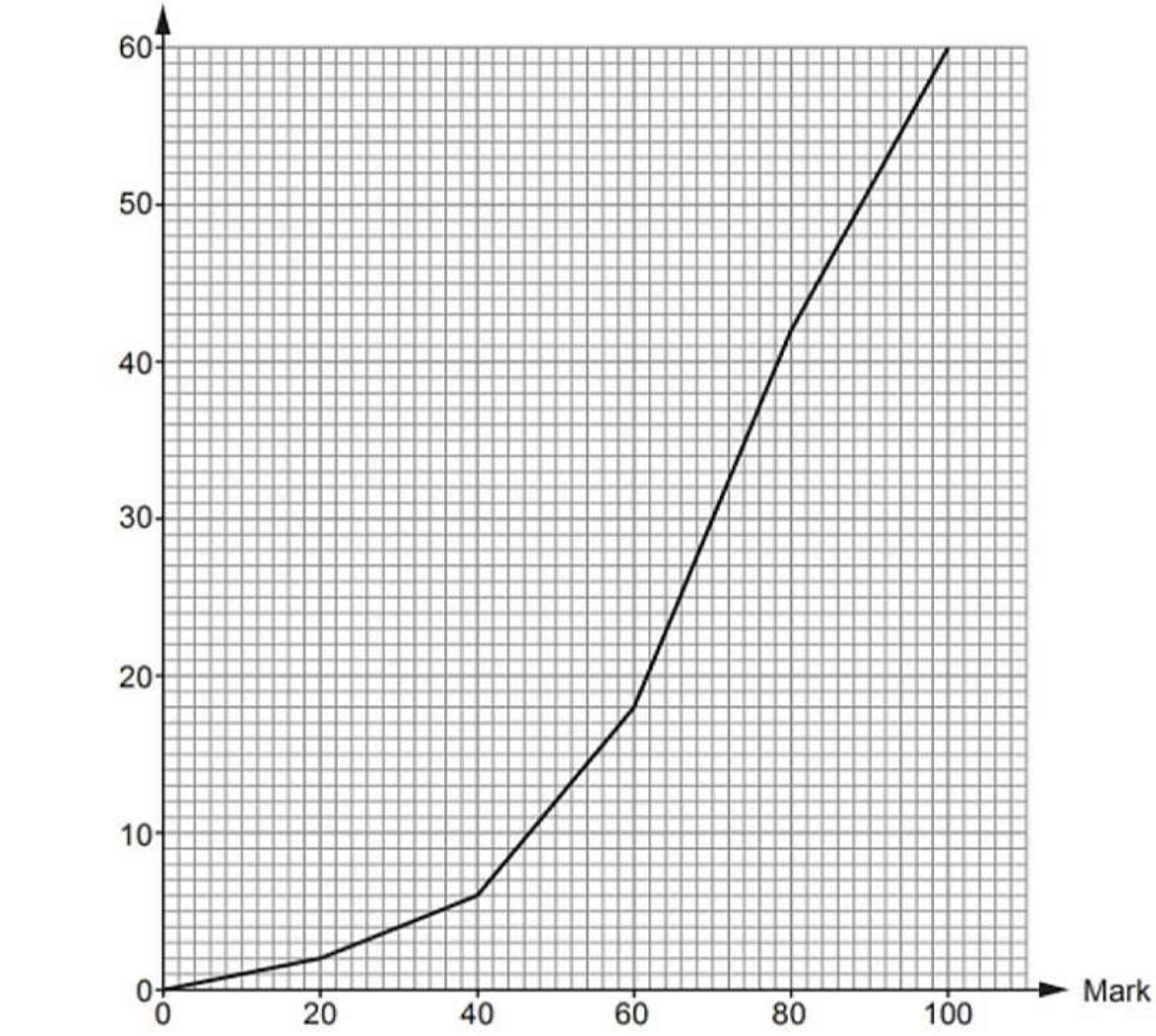
Use the cumulative frequency diagram to answer each of the following questions.

(ii) Which of the following is the best estimate for the median monthly wage of *Maesteg Electrical* employees?
Circle your answer. [1]

(iii) Calculate an estimate of the percentage of *Maesteg Electrical* employees who have a monthly wage of less than £2050.
You must show all your working. [2]

Higher Numeracy Nov 2018 P1 Q9

A group of pupils sat a mathematics test.
The teacher grouped their marks using the intervals 1 to 20, 21 to 40, and so on.
She then drew the following cumulative frequency diagram to display the results.



(a) Phoebe is one of the pupils who sat the test.
Phoebe says,
'The cumulative frequency diagram shows that the median mark was 70.'

Explain why the median mark may not be 70. [1]

(b) Consider the pupils who had a mark of 80 or less.

How many of these pupils would have needed to score more than 80 for Phoebe's estimate of the median to be 80?
Circle your answer. [1]

10 12 18 5 20