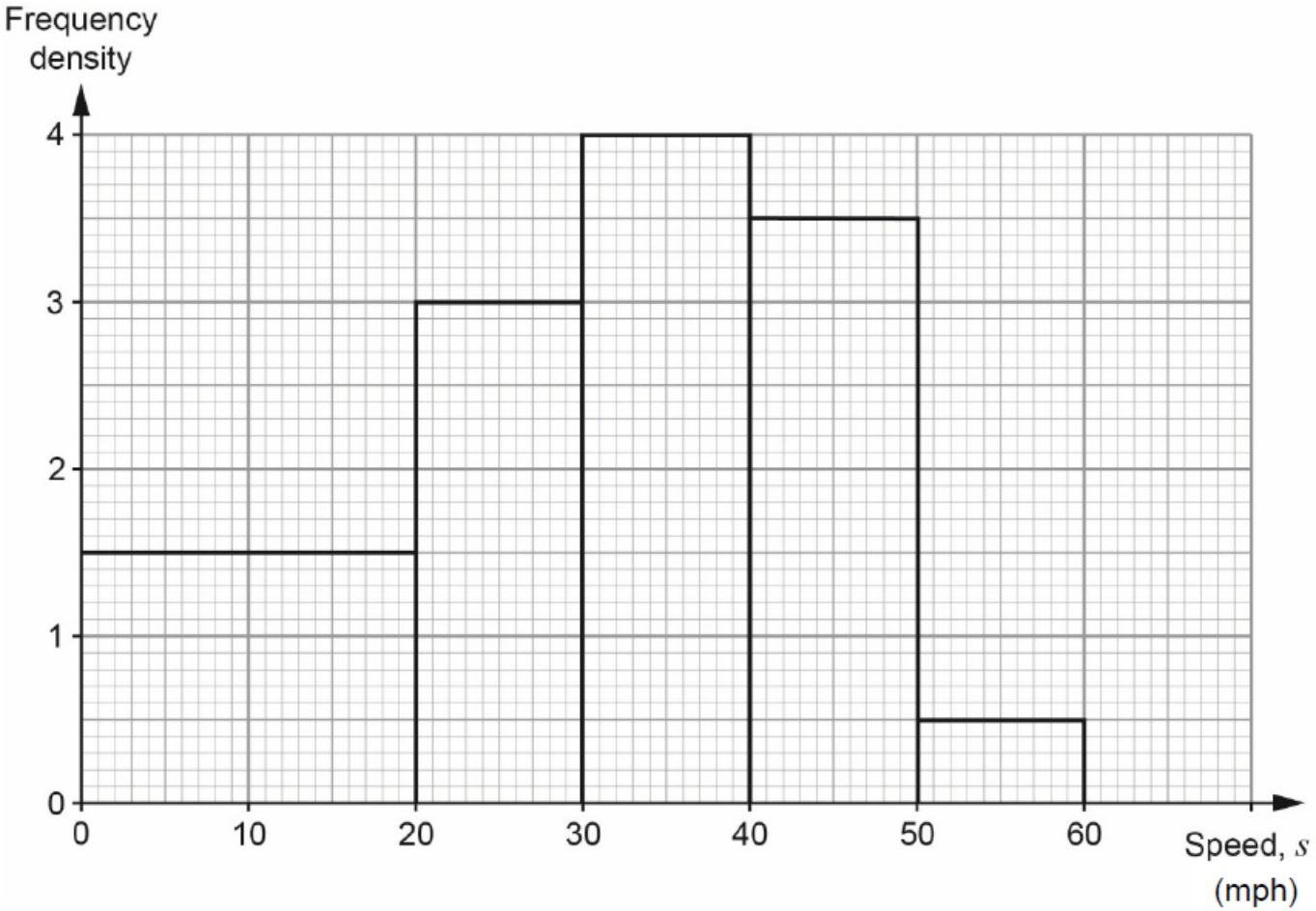
Histograms (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	
Total Marks:	

1. A survey was carried out to record the speeds of cars entering a village.

   The histogram illustrates the results of the survey.



(a) Use the histogram to complete the grouped frequency table below.

Speed, s (mph)	$0 < s \leq 20$	$20 < s \leq 30$	$30 < s \leq 40$	$40 < s \leq 50$	$50 < s \leq 60$
Frequency					

[2]

(b) 40% of the cars surveyed were fined for exceeding a certain speed as they entered the village.

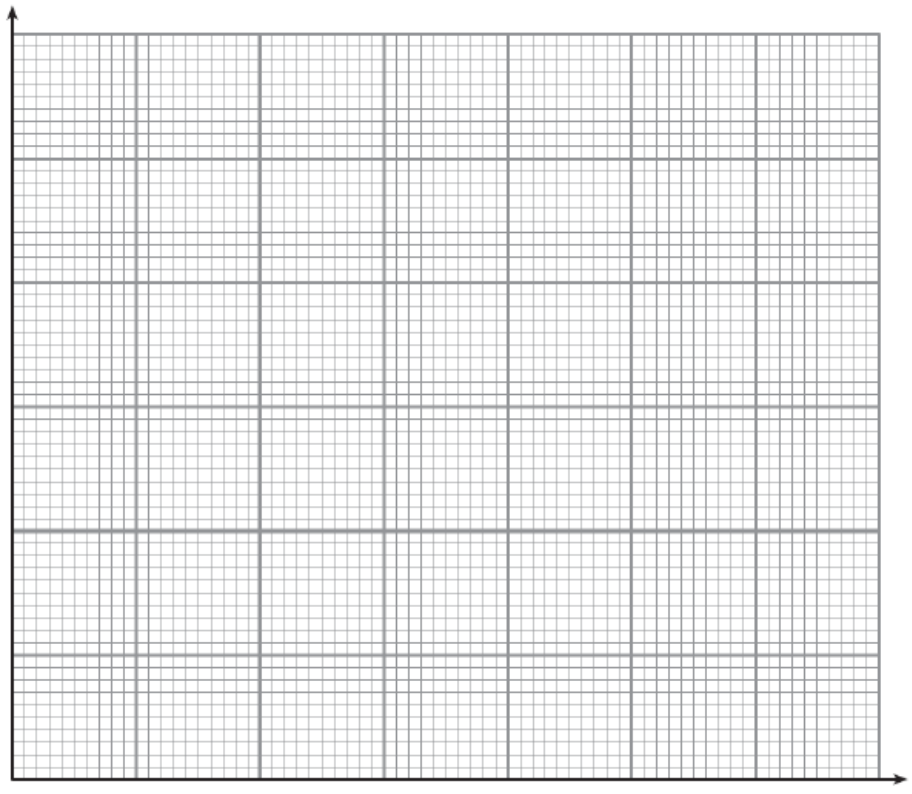
Calculate an estimate of this speed.

[4]

(c) A further survey was carried out after the placement of a speed camera warning sign.

Speed, s (mph)	$0 < s \leq 20$	$20 < s \leq 30$	$30 < s \leq 40$	$40 < s \leq 50$	$50 < s \leq 60$
Frequency	60	40	20	15	5

Draw a histogram to illustrate the results of this survey.



[3]

(d) Compare the two histograms. Do you consider the speed camera warning sign to have been effective?

Give a reason for your answer.

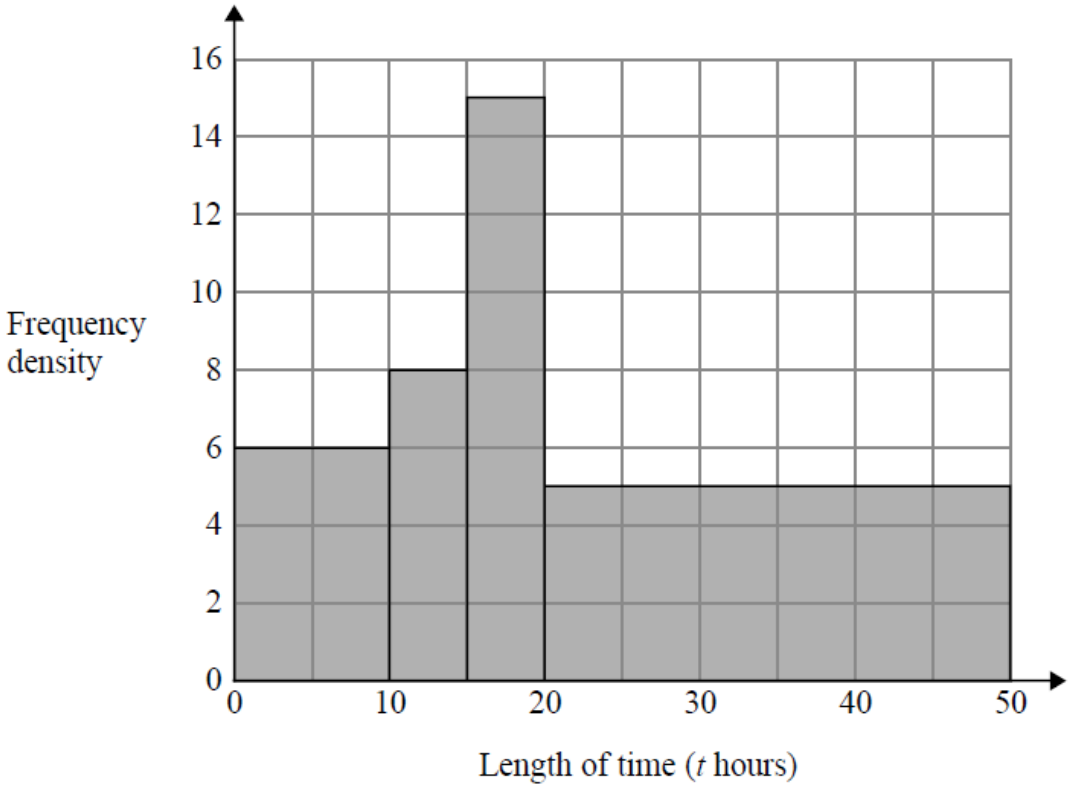
[1]

2. Bhavna recorded the lengths of time, in hours, that some adults watched TV last week.

The table shows information about her results.

Length of time (t hours)	Frequency
$0 \leqslant t < 10$	6
$10 \leqslant t < 15$	8
$15 \leqslant t < 20$	15
$20 \leqslant t < 40$	5

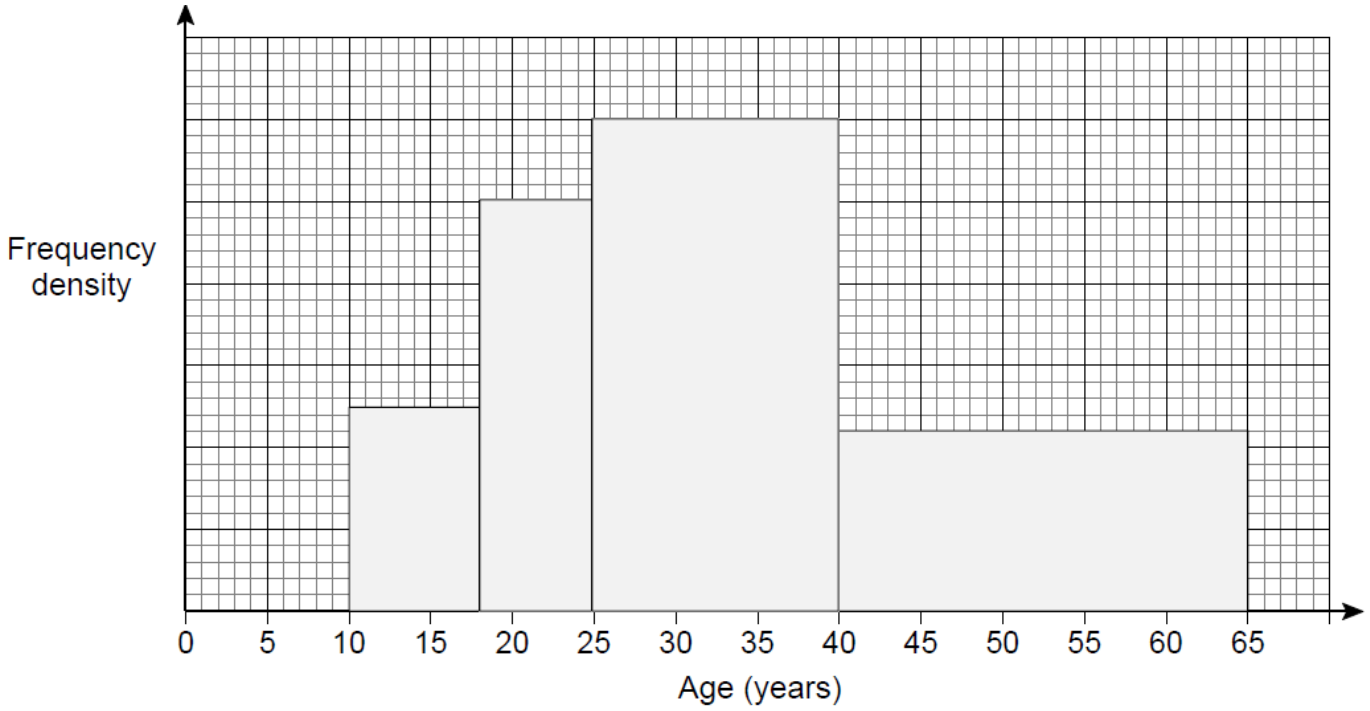
Bhavna made some mistakes when she drew a histogram for this information.



Write down two mistakes Bhavna made.

[2]

3. The histogram shows the ages, in years, of members of a chess club.



There are 22 members with ages in the range $40 \leqslant \text{age} < 65$

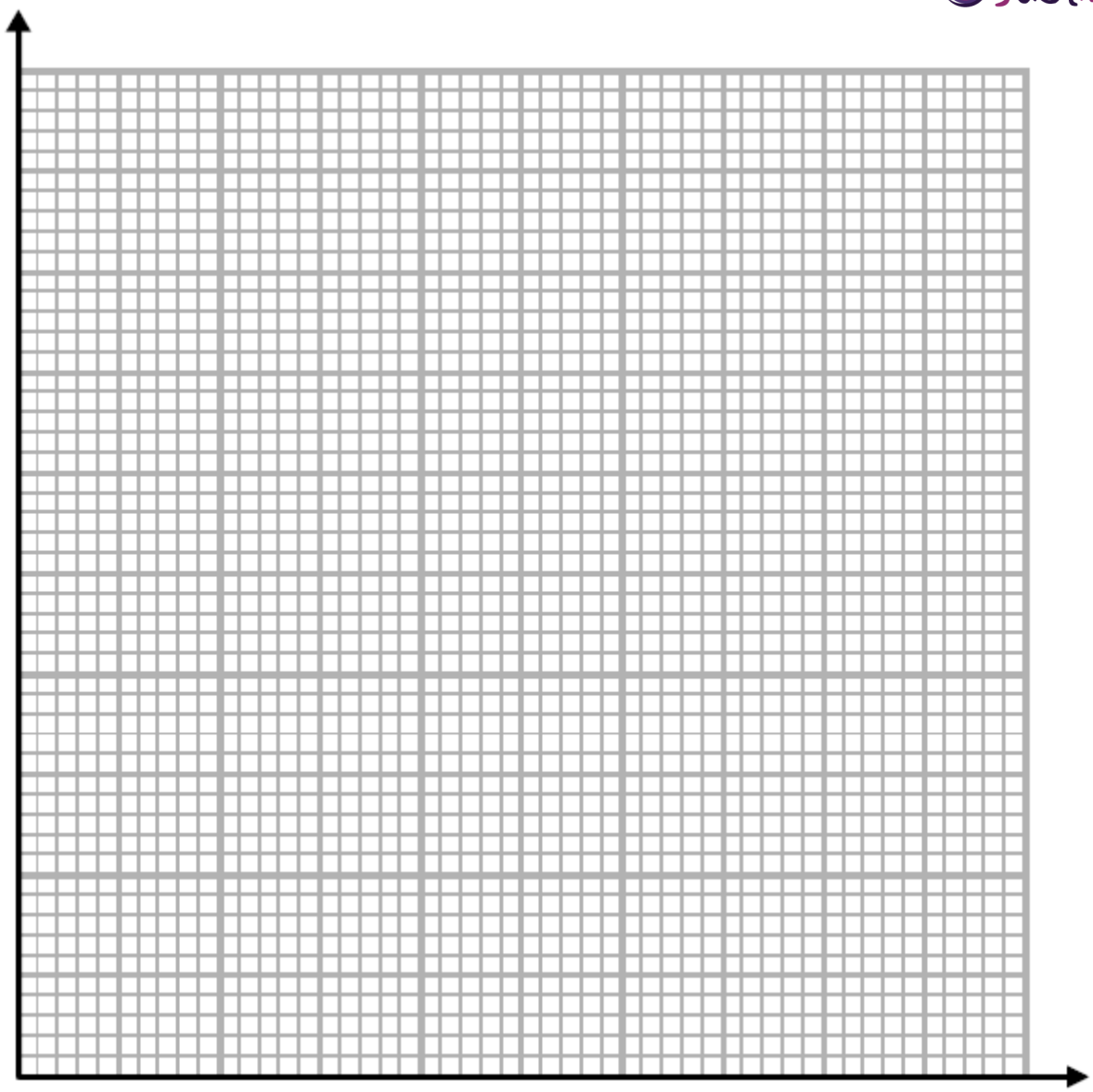
Work out the number of members with ages in the range $25 \leqslant \text{age} < 40$

[4]

4. The table gives information about the speeds, in km/h, of 81 cars.

Speed (s km/h)	Frequency
$90 < s \leqslant 100$	13
$100 < s \leqslant 105$	16
$105 < s \leqslant 110$	18
$110 < s \leqslant 120$	22
$120 < s \leqslant 140$	12

a) On the grid, draw a histogram for the information in the table.

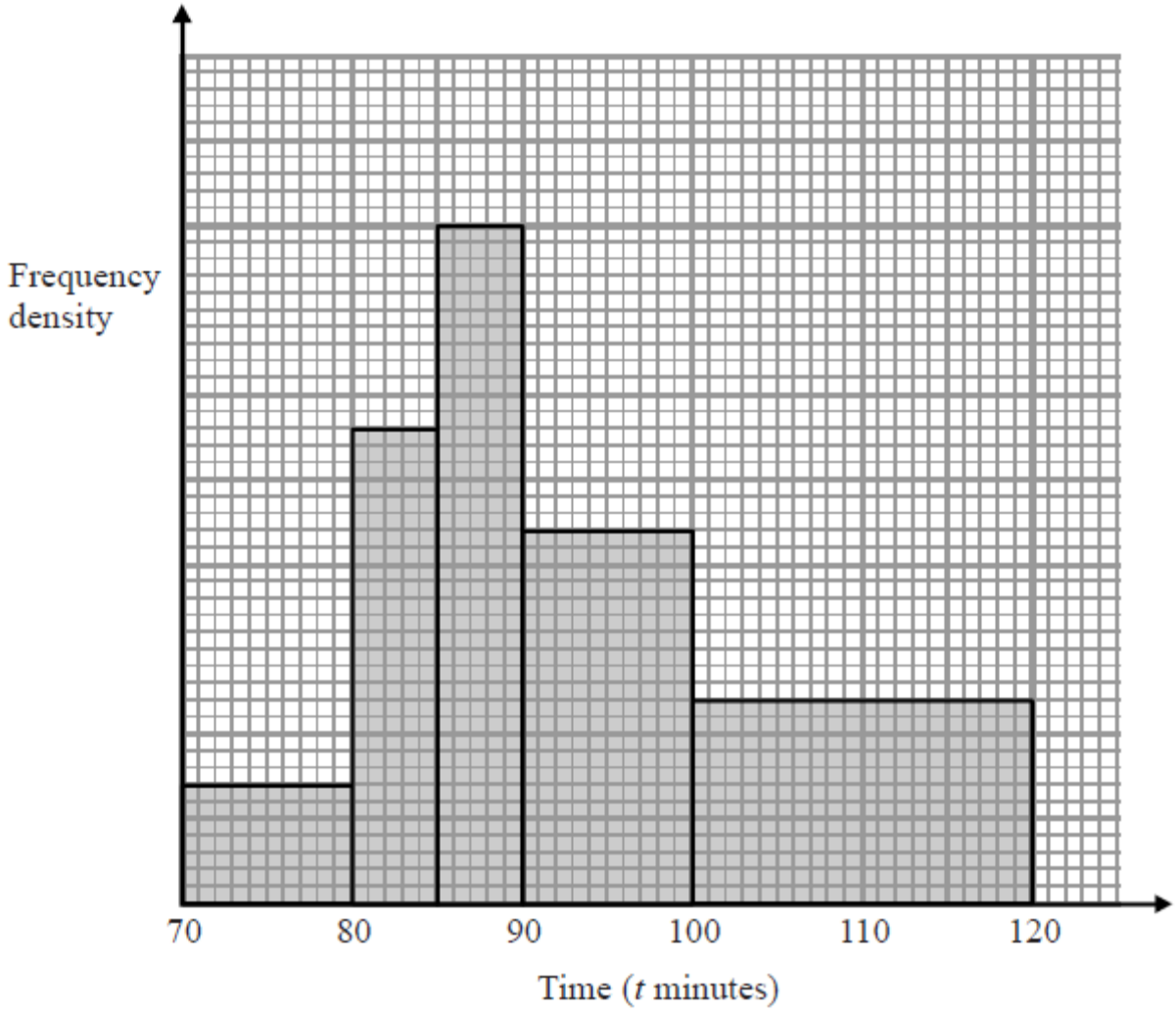


[3]

b) Find an estimate for the median.

.....km/h [2]

5. The histogram shows information about the time taken by cyclists to finish a cycle race.



7 cyclists took 80 minutes or less to finish the race.

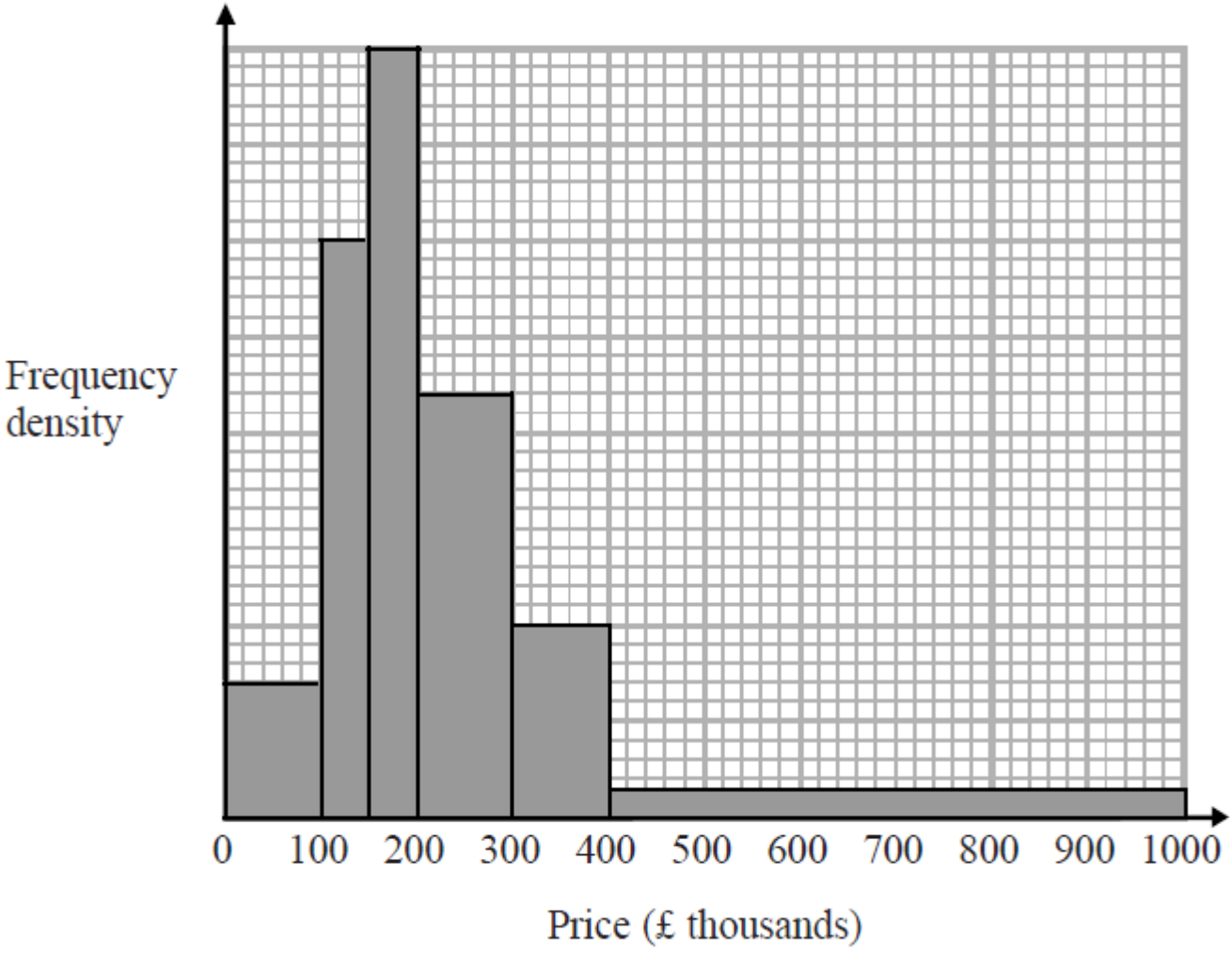
(i) Work out an estimate for the number of cyclists who took more than 105 minutes to finish the race.

.....

(ii) Explain why your answer to part (i) is only an estimate.

[4]

6. The histogram gives information about house prices in a village in 2015



20 houses in the village have a price between £300000 and £400000

Work out the number of houses in the village with a price under £200000

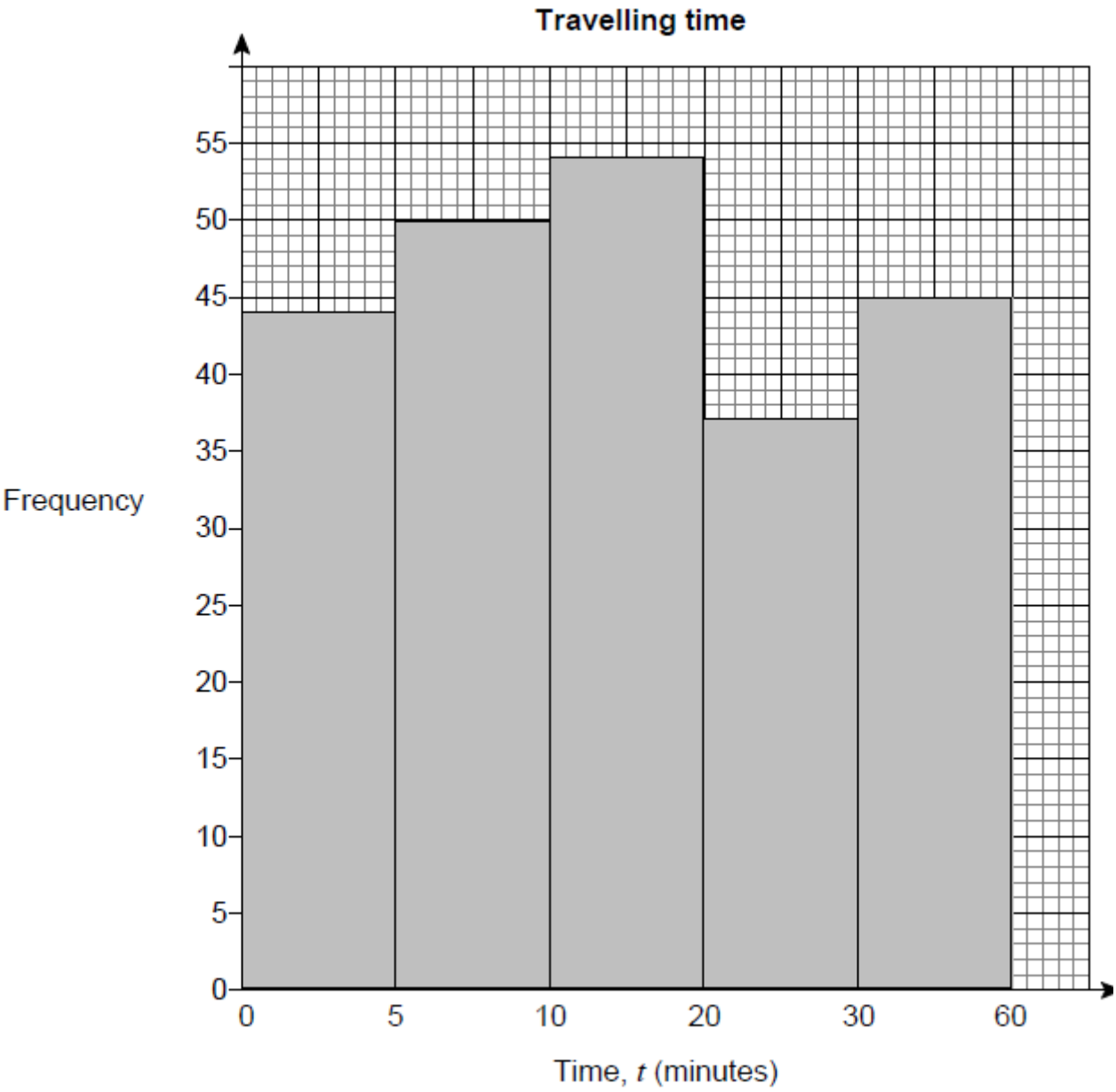
[3]

7. Joe asked 230 students how long it took them to travel to school.

The results are shown in the table.

Travelling time, t (minutes)	Number of students
$0 < t \leqslant 5$	44
$5 < t \leqslant 10$	50
$10 < t \leqslant 20$	54
$20 < t \leqslant 30$	37
$30 < t \leqslant 60$	45

This is Joe's attempt to draw a histogram to show the data.



Make two criticisms of his histogram.

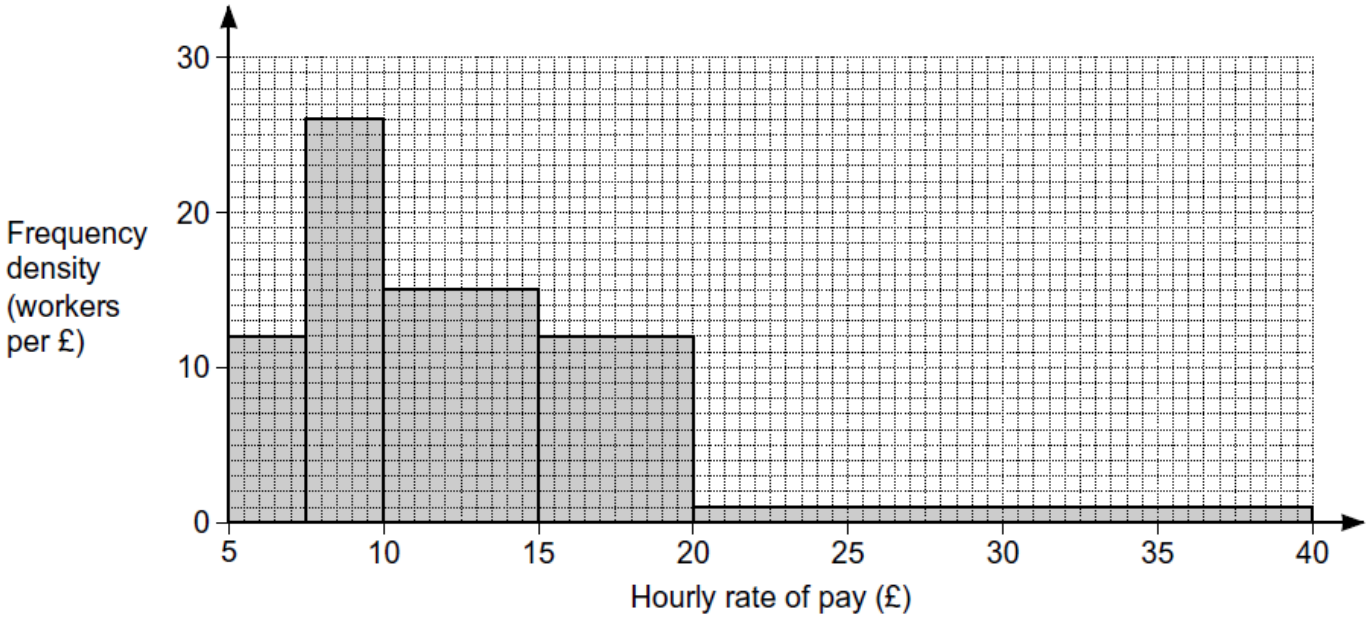
Criticism 1

Criticism 2

[2]

8. Omar surveyed a group of workers to find their hourly rate of pay.

His results are summarised in the histogram.



a) Show that Omar surveyed 250 workers.

[3]

b) The UK living wage is £7.85 per hour.

A newspaper states that one fifth of workers earn less than the living wage.

i) Does Omar's survey support the statement in the newspaper?

Show how you decide.

[4]

ii) Explain why your calculations in part (b)(i) may not give the exact number of workers earning less than the living wage.

[1]

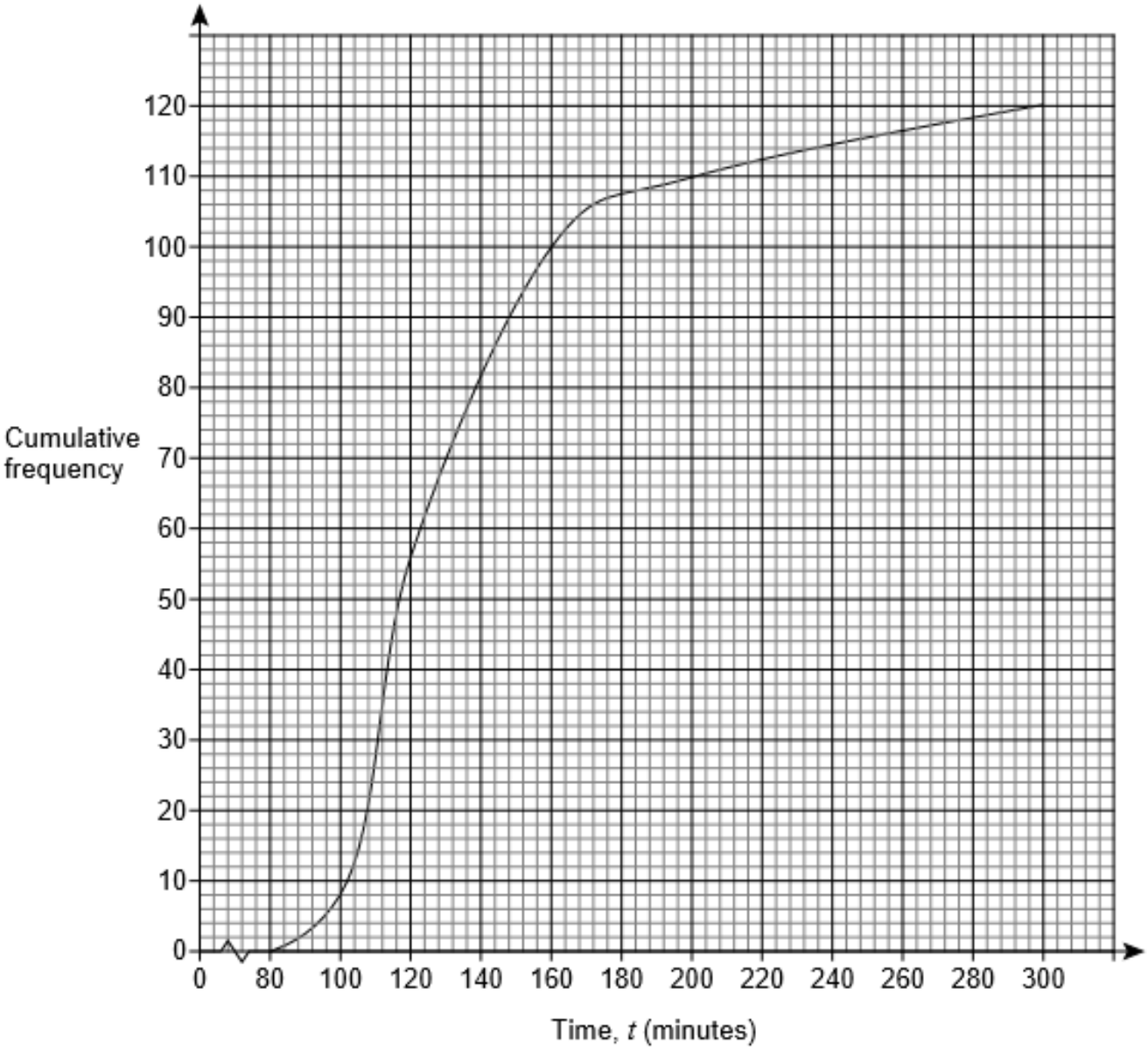
c) Omar used this table to record the ages of the people in his survey.

Age (a years)	$18 \leqslant a \leqslant 20$	$20 \leqslant a \leqslant 30$	$30 \leqslant a \leqslant 40$	$40 \leqslant a \leqslant 50$	$50 \leqslant a \leqslant 70$

Comment on one problem with his table.

[1]

9. The cumulative frequency diagram shows the times taken by runners to complete a half-marathon.

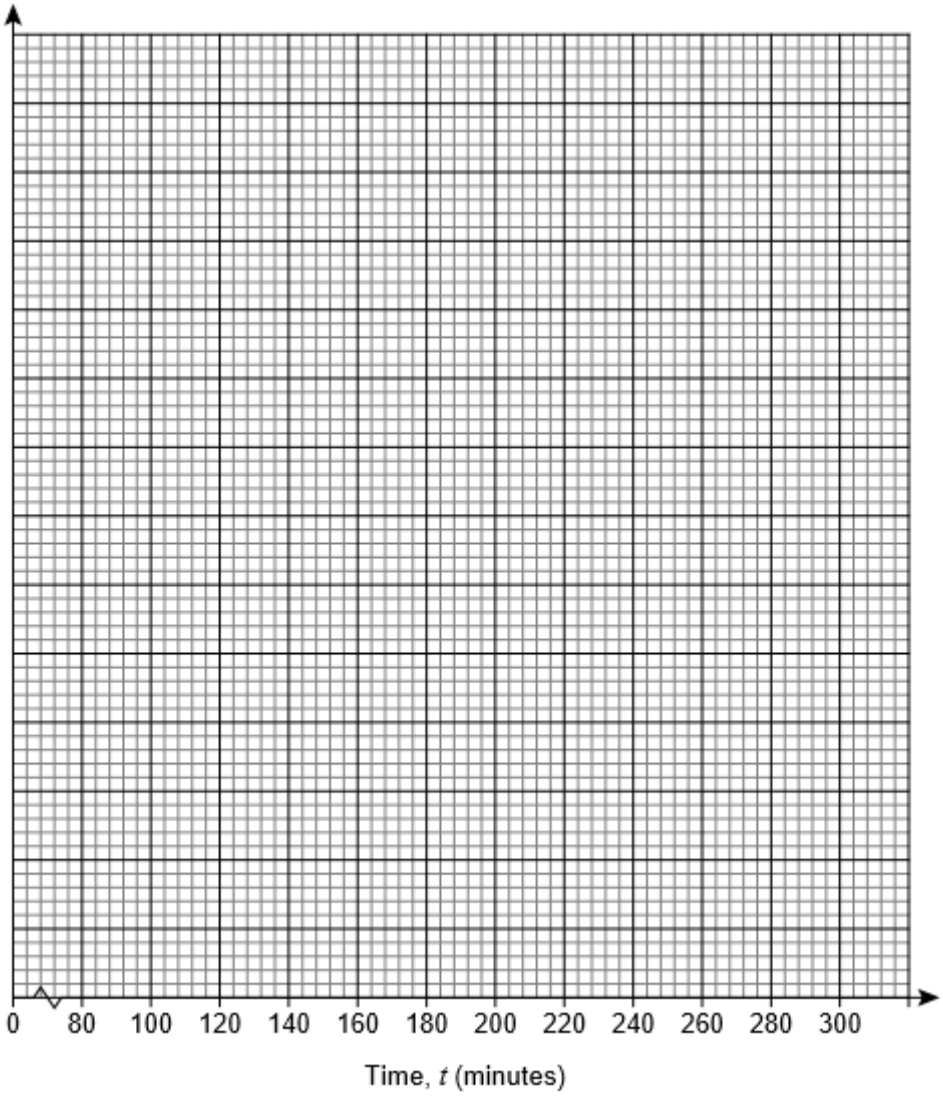


On the grid opposite, draw a histogram to represent the data.

Use this table to help you.

Time, t (minutes)	Cumulative frequency
$t < 100$	
$t < 120$	
$t < 160$	
$t < 200$	
$t < 300$	

Time, t (minutes)	Frequency	Class width	Frequency density
$80 \leqslant t < 100$			
$100 \leqslant t < 120$			
$120 \leqslant t < 160$			
$160 \leqslant t < 200$			
$200 \leqslant t < 300$			



[6]

CREDITS AND NOTES

Question	Awarding Body
1	WJEC Eduqas
2	Pearson Edexcel
3	AQA
4	Pearson Edexcel
5	Pearson Edexcel
6	Pearson Edexcel
7	AQA
8	OCR
9	AQA

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material