
Question 1

Daniel took a sample of 100 pebbles from Tawny Beach.

He weighed each pebble and recorded its weight.

He used the information to draw the cumulative frequency graph shown on the grid.

(a) Use the cumulative frequency graph to find an estimate for

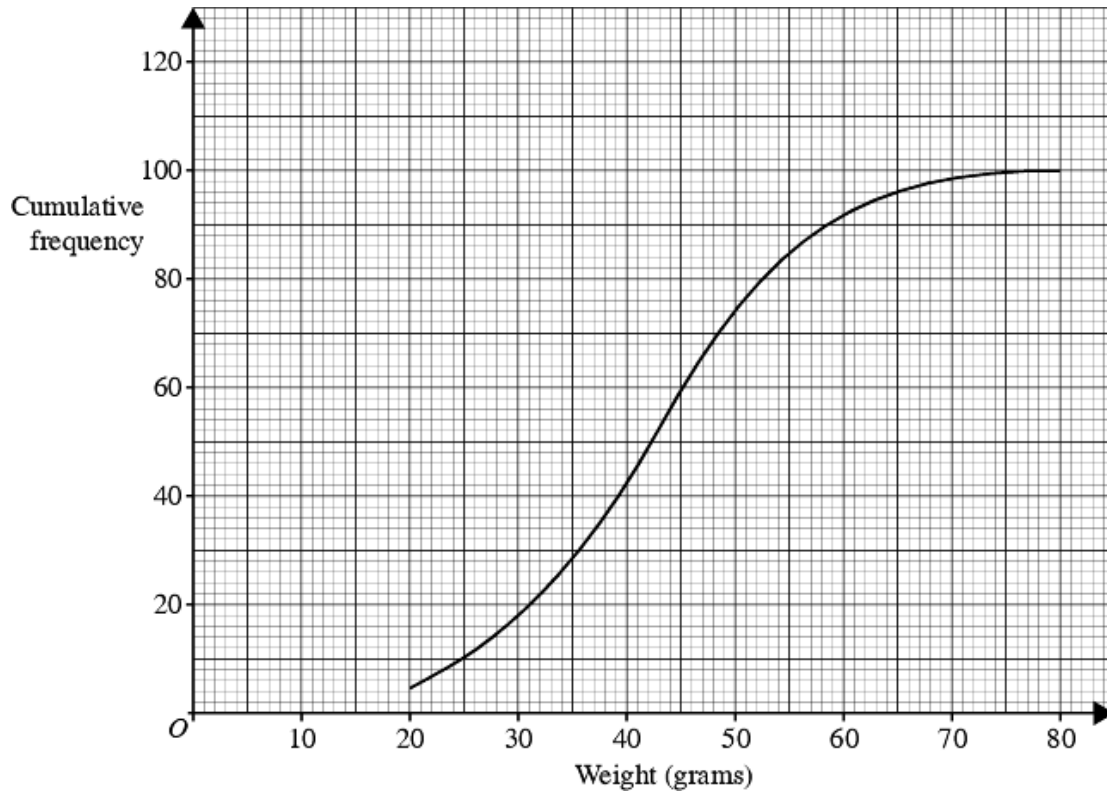
(i) the median weight of these pebbles,

..... grams

(ii) the number of pebbles with a weight more than 60 grams.

.....

(3 marks)



Daniel also took a sample of 100 pebbles from Golden Beach.

The table shows the distribution of the weights of the pebbles in the sample from Golden Beach.

Weight (w grams)	Cumulative frequency
$0 < w \leq 20$	1
$0 < w \leq 30$	15
$0 < w \leq 40$	36
$0 < w \leq 50$	65
$0 < w \leq 60$	84
$0 < w \leq 70$	94
$0 < w \leq 80$	100

(b) On the same grid, draw the cumulative frequency graph for the information shown in the table.

(2 marks)

Daniel takes one pebble, at random, from his sample from Tawny Beach and one pebble, at random, from his sample from Golden Beach.

(c) Work out the probability that the weight of the pebble from Tawny Beach is more than 60 grams **and** the weight of the pebble from Golden Beach is more than 60 grams.

.....
(4 marks)

Question 2

The table gives information about the ages, in years, of 100 aeroplanes.

Age (t years)	Frequency
$0 < t \leq 5$	41
$5 < t \leq 10$	26
$10 < t \leq 15$	20
$15 < t \leq 20$	10
$20 < t \leq 25$	1

- (a) Work out an estimate of the mean age of the aeroplanes.

(4 marks)

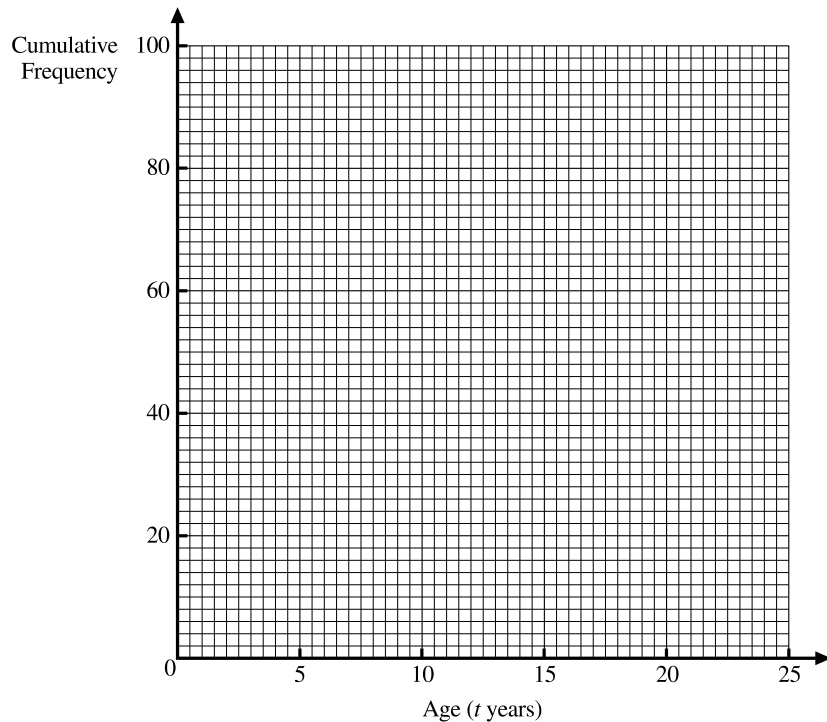
- (b) Complete the cumulative frequency table.

Age (t years)	Frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	

(1 mark)

- (c) On the grid, draw a cumulative frequency graph for your table.

(2 marks)



- (d) Use your graph to find an estimate of the upper quartile of the ages.

Show your method clearly.

(2 marks)

Question 3

150 year 11 pupils took a mathematics examination.
The table shows information about their marks.

Floor area (x) in m^2	Cumulative Frequency
$0 < x \leq 100$	4
$0 < x \leq 150$	20
$0 < x \leq 200$	49
$0 < x \leq 250$	97
$0 < x \leq 300$	114
$0 < x \leq 350$	118
$0 < x \leq 400$	120

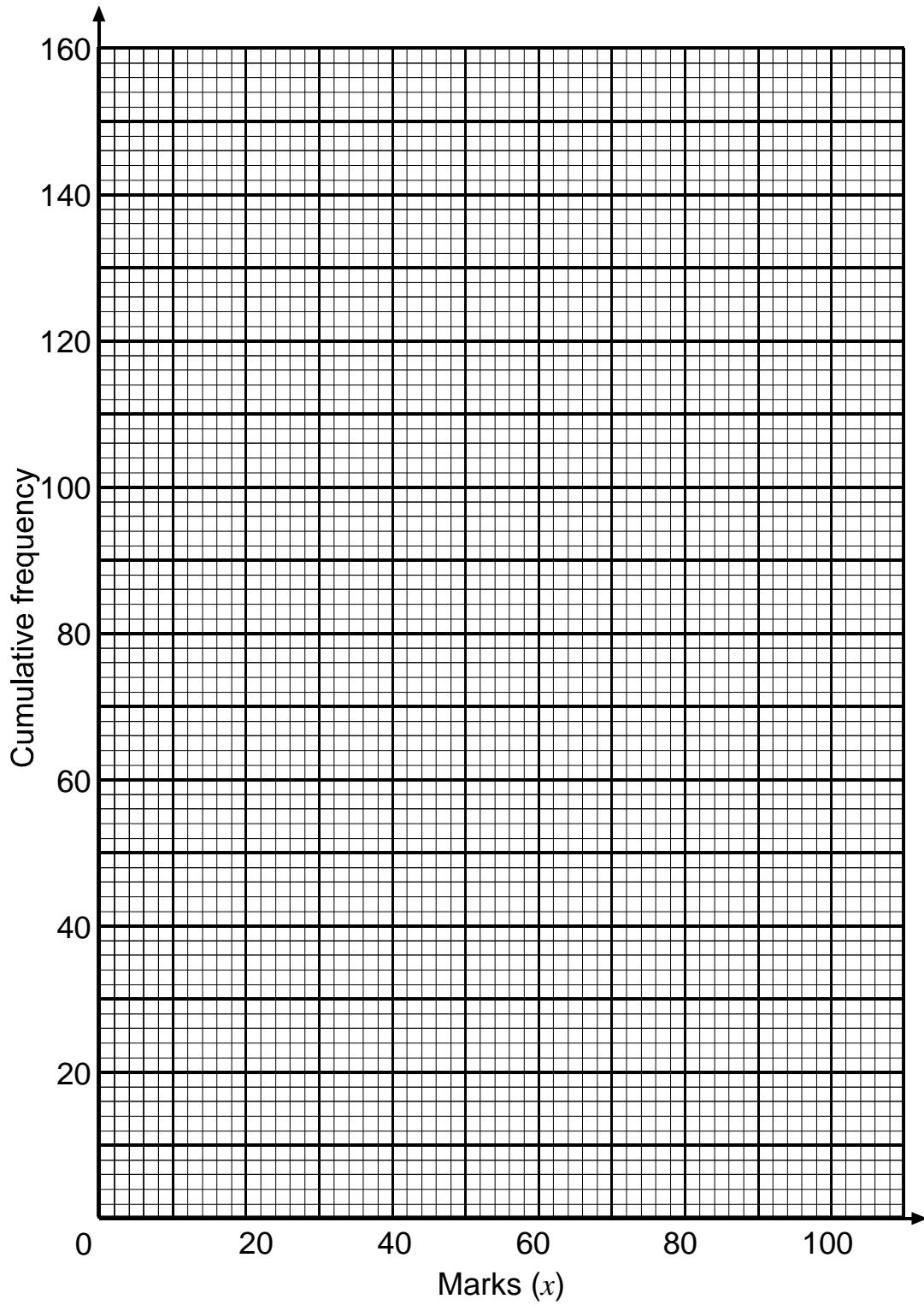
(a) Complete the cumulative frequency table below.

Marks (x)	Cumulative Frequency
$0 \leq x < 20$	
$0 \leq x < 30$	
$0 \leq x < 40$	
$0 \leq x < 50$	
$0 \leq x < 60$	
$0 \leq x < 70$	
$0 \leq x < 80$	
$0 \leq x < 100$	

(b) On the grid on the next page, draw a cumulative frequency diagram to show these marks.

60% of the pupils passed the examination.

(c) Use your diagram to find an estimate for the pass mark for the examination.



Question 4

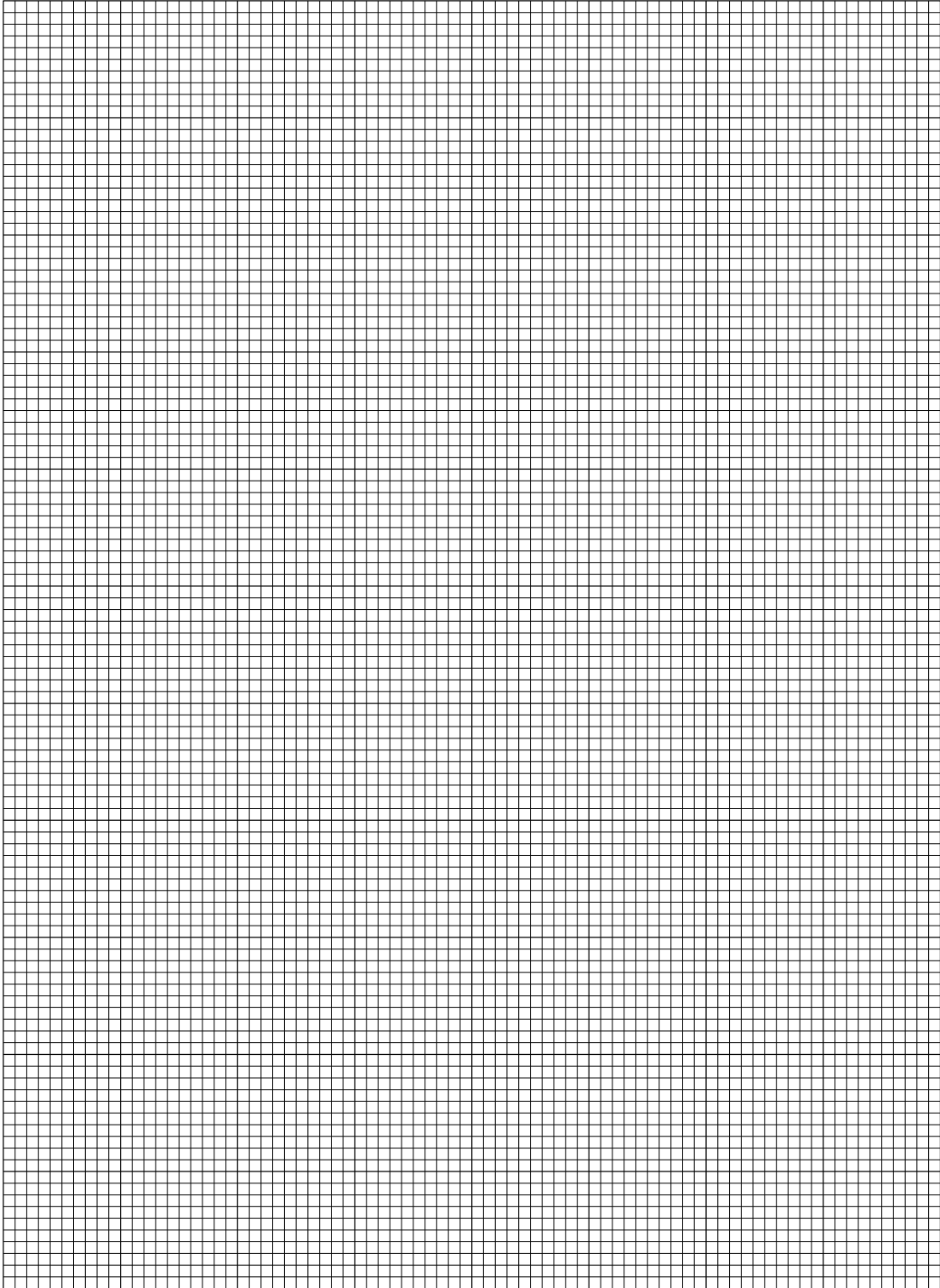
Twenty five people took part in a competition.
The points scored are grouped in the frequency table below.

Points scored	Number of people		
1 to 5	1		
6 to 10	2		
11 to 15	5		
16 to 20	7		
21 to 25	8		
26 to 30	2		

- (a) Work out an estimate for the mean number of points scored. **(3 marks)**
(b) Complete the table below to show the cumulative frequency for this data. **(2 marks)**

Points scored	Cumulative frequency
1 to 5	
6 to 10	
11 to 15	
16 to 20	
21 to 25	
26 to 30	

- (c) On graph paper, draw a cumulative frequency graph for this data. **(3 marks)**
(d) Use your graph to find an estimate for the median of this data. **(1 mark)**



Question 5

The grouped frequency table shows information about the number of hours worked by each of 200 headteachers in one week.

Number of hours worked (t)	Frequency
$0 < t \leq 30$	0
$30 < t \leq 40$	4
$40 < t \leq 50$	18
$50 < t \leq 60$	68
$60 < t \leq 70$	79
$70 < t \leq 80$	31

- (a) Work out an estimate of the mean number of hours worked by the headteachers that week.

..... hours
(4 marks)

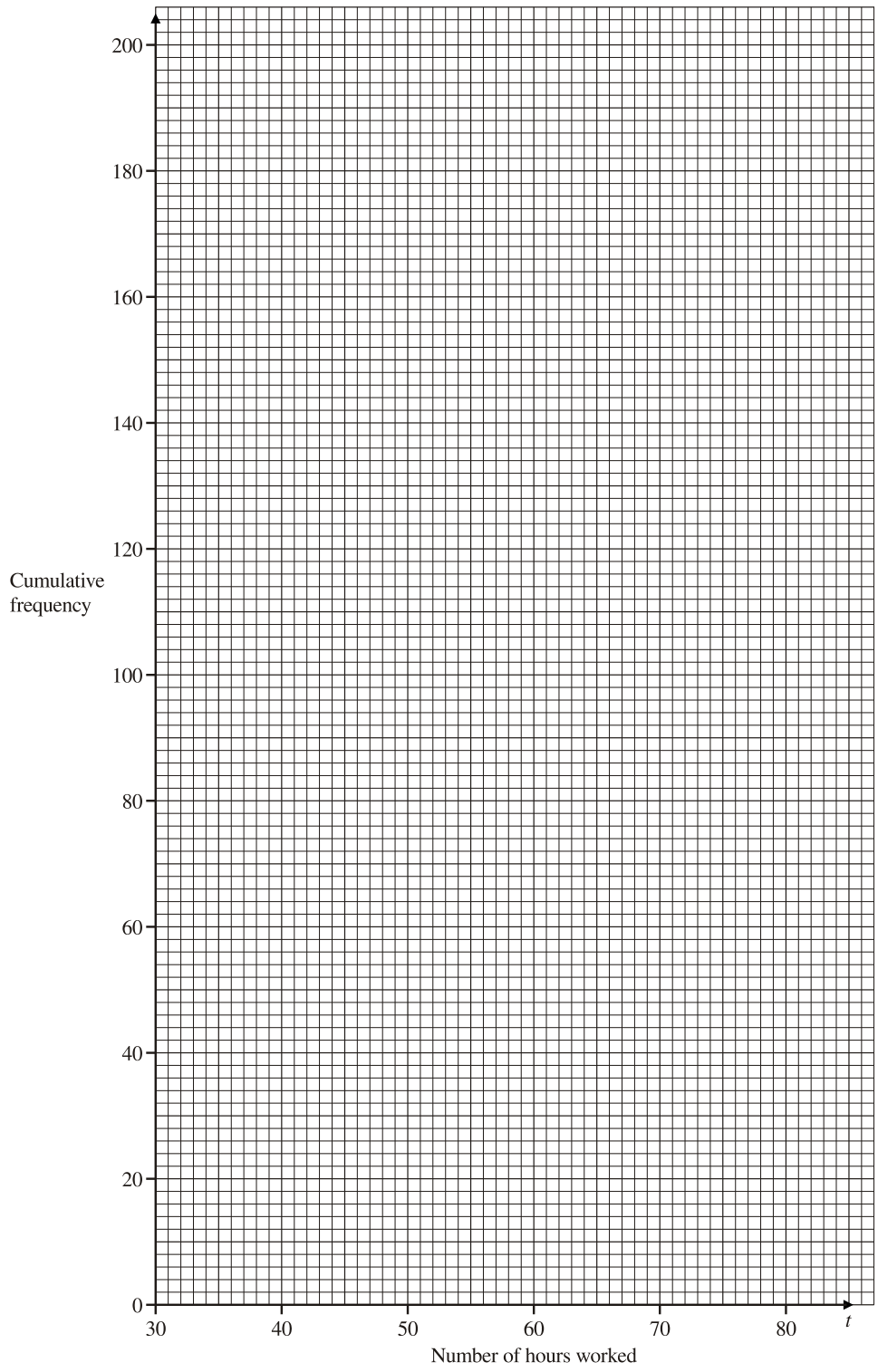
- (b) Complete the cumulative frequency table.

Number of hours worked (t)	Cumulative Frequency
$0 < t \leq 30$	0
$0 < t \leq 40$	
$0 < t \leq 50$	
$0 < t \leq 60$	
$0 < t \leq 70$	
$0 < t \leq 80$	

(1 mark)

- (c) On the grid below, draw a cumulative frequency graph for your table.

(2 marks)



(d) Use your graph to find an estimate for the interquartile range of the number of hours worked by the headteachers that week.
 Show your method clearly.

..... hours
(2 marks)

Question 6

Pippa collected data for the heights (h) of the students in her class.

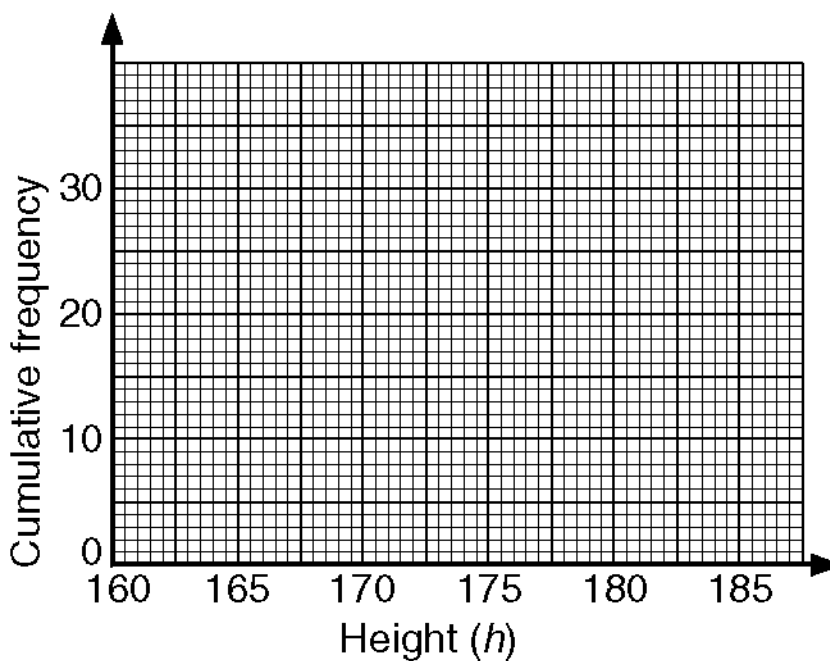
Here is the grouped frequency table of her results.

Height (h) in cm	Frequency		
$160 \leq h < 165$	7		
$165 \leq h < 170$	6		
$170 \leq h < 175$	2		
$175 \leq h < 180$	10		
$180 \leq h < 185$	5		

(a) Use the table to calculate an estimate of the mean for her results.

(b) Complete the cumulative frequency table for Pippa's data and hence draw a cumulative frequency graph for the data.

Group	Frequency	Cumulative frequency
$160 \leq h < 165$	7	7
$165 \leq h < 170$	6	
$170 \leq h < 175$	2	
$175 \leq h < 180$	10	
$180 \leq h < 185$	5	



(c) Use the cumulative frequency graph to calculate **i)** the median, and **ii)** the interquartile range of the data

Question 7

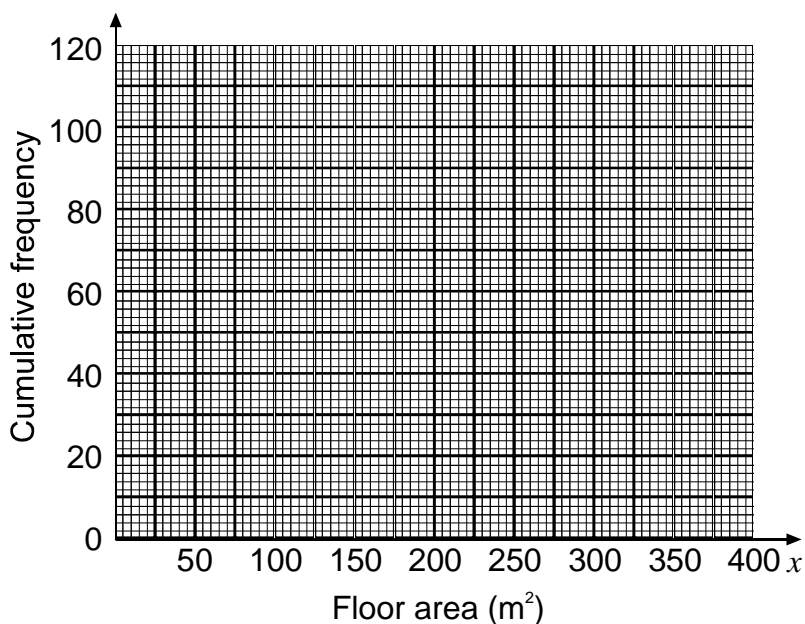
A survey is made of all 120 houses on an estate.

The floor area, in m^2 , of each house is recorded.

The results are shown in the cumulative frequency table.

Floor area (x) in m^2	Cumulative Frequency
$0 < x \leq 100$	4
$0 < x \leq 150$	20
$0 < x \leq 200$	49
$0 < x \leq 250$	97
$0 < x \leq 300$	114
$0 < x \leq 350$	118
$0 < x \leq 400$	120

(a) On the grid draw a cumulative frequency graph for the table.



(b) Use your cumulative frequency graph to estimate the interquartile range of the floor areas of the houses.

The houses on the estate with the greatest floor areas are called luxury houses. 10% of the houses are luxury houses.

(c) Use your graph to estimate the minimum floor area for a luxury house.

Question 8

2400 people took an examination paper.
The maximum mark for this paper was 80.

The cumulative frequency graph overleaf gives information about the marks.

The pass mark was 44 marks.

- (a) Use the cumulative frequency graph to estimate the number of people who did **not** pass this paper.

(2 marks)

The same 2400 people took a second examination paper.

The table gives information about the marks for the second paper.

The maximum mark was 80.

Mark	Cumulative frequency
0–10	20
0–20	80
0–30	200
0–40	500
0–50	900
0–60	1800
0–70	2200
0–80	2400

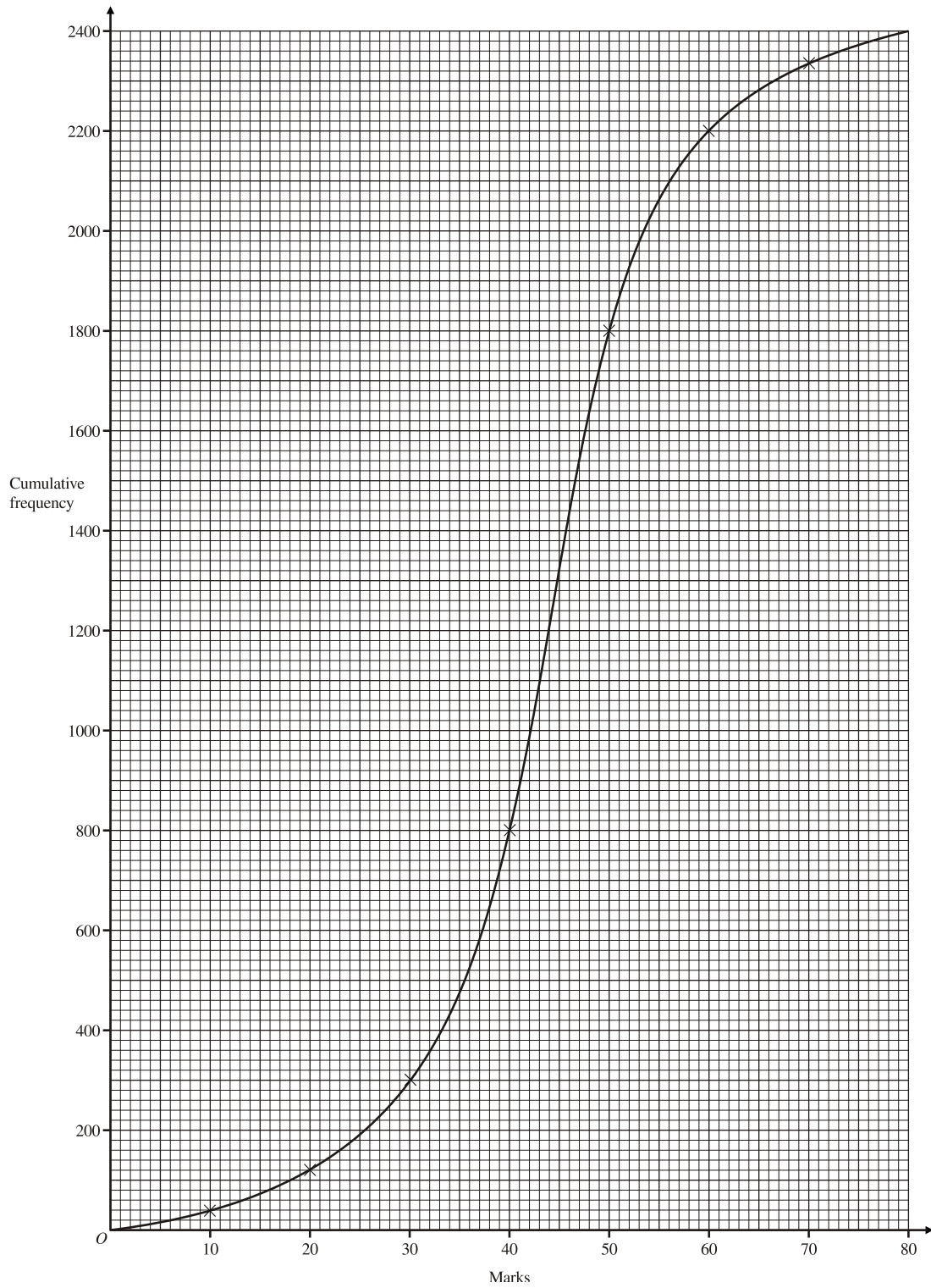
- (b) On the grid overleaf draw a cumulative frequency graph to show this information.

(2 marks)

The same number of people did not pass this paper.

- (c) Use your cumulative frequency graph to estimate the pass mark for the second paper.

(2 marks)



Question 9

At a supermarket, members of staff recorded the lengths of time that 80 customers had to wait in the queues at the check-outs.

The waiting times are grouped in the frequency table opposite.

Waiting time (t seconds)	Frequency
$0 < t \leq 50$	4
$50 < t \leq 100$	7
$100 < t \leq 150$	10
$150 < t \leq 200$	16
$200 < t \leq 250$	30
$250 < t \leq 300$	13

- (a) Complete the cumulative frequency table opposite.

Waiting time (t seconds)	Cumulative Frequency
$0 < t \leq 50$	
$0 < t \leq 100$	
$0 < t \leq 150$	
$0 < t \leq 200$	
$0 < t \leq 250$	
$0 < t \leq 300$	

(2 marks)

- (b) On the grid overleaf, draw a cumulative frequency graph for this data.

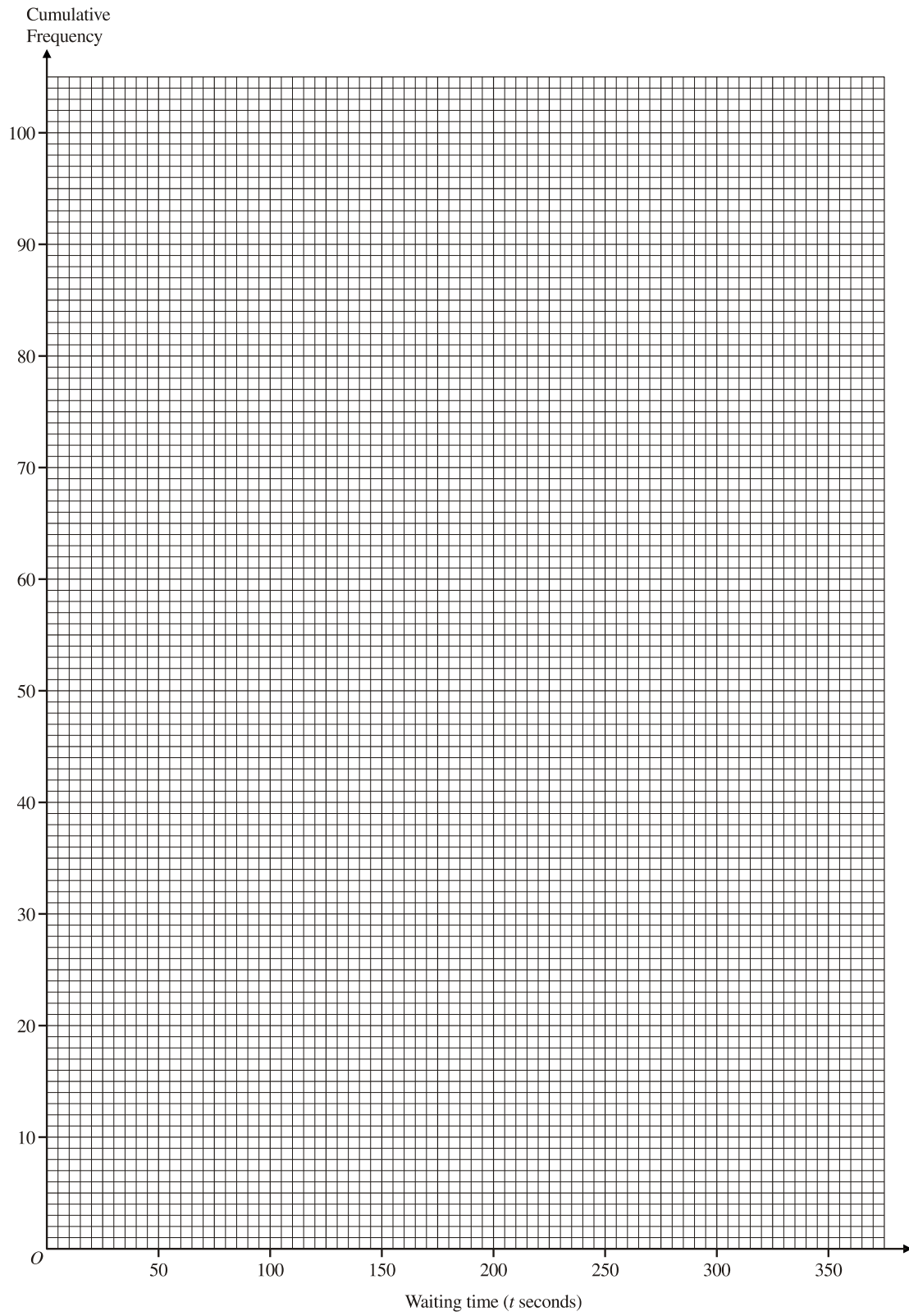
(2 marks)

- (c) Use your graph to work out an estimate for

(i) the median waiting time,seconds

(ii) the number of these customers who had to wait for more than 3 minutes.

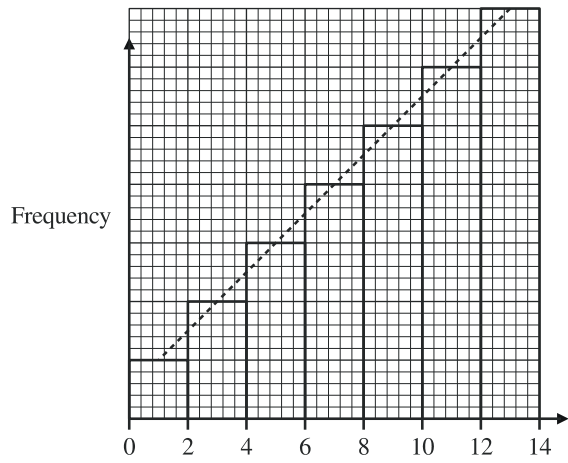
(3 marks)



Question 10

The diagrams show frequency polygons and cumulative frequency graphs.
Each cumulative frequency graph represents the same information as one of the frequency polygons.

Write down the letters of the pairs of diagrams which represent the same information.



A

A and

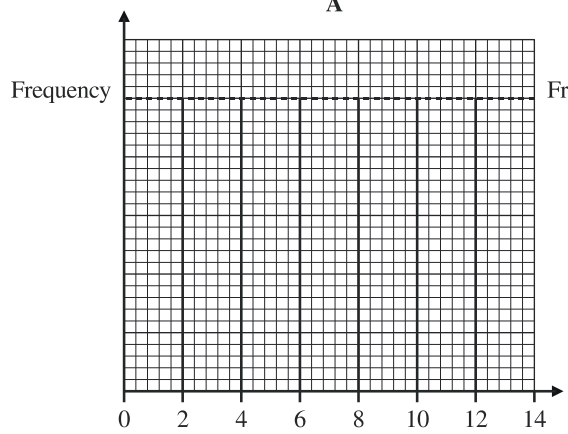
B and

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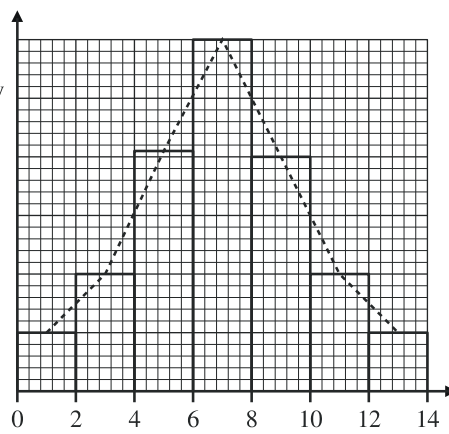
D and

E and

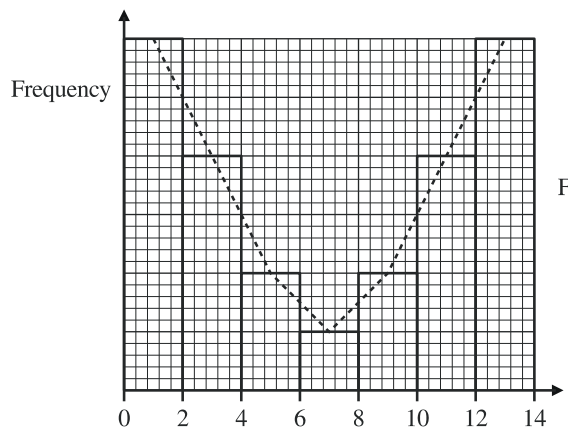
(3 marks)



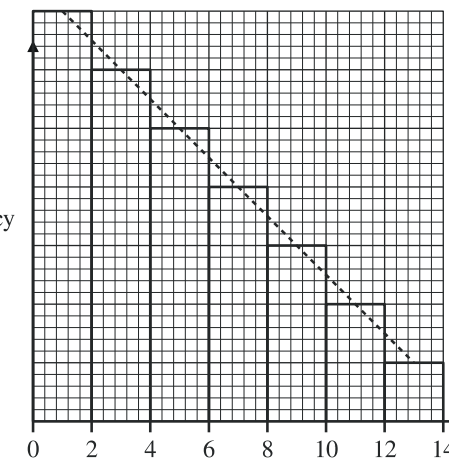
B



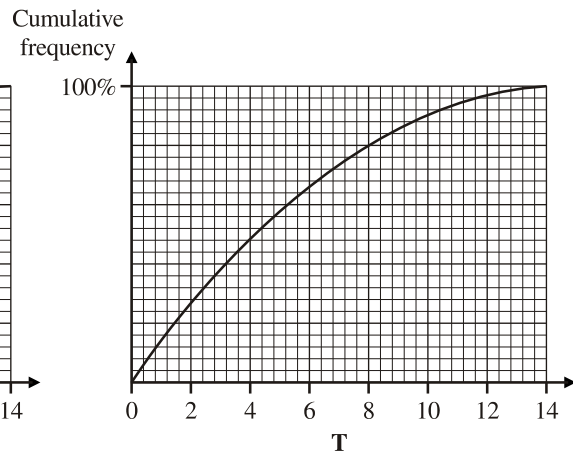
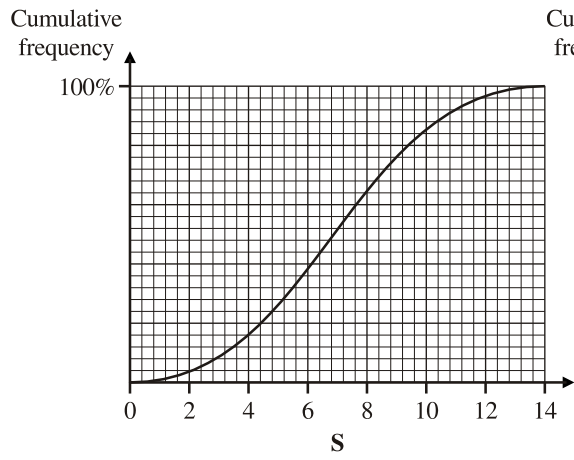
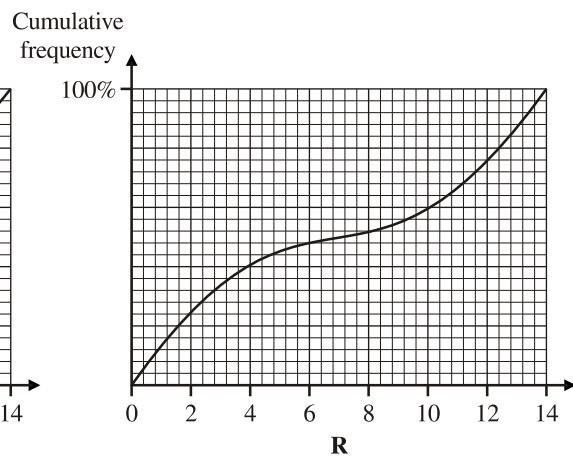
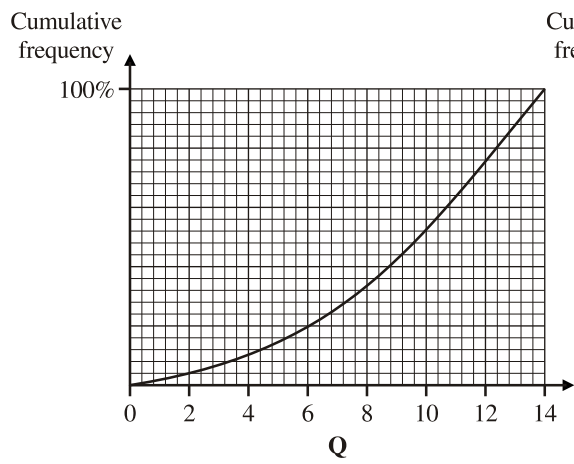
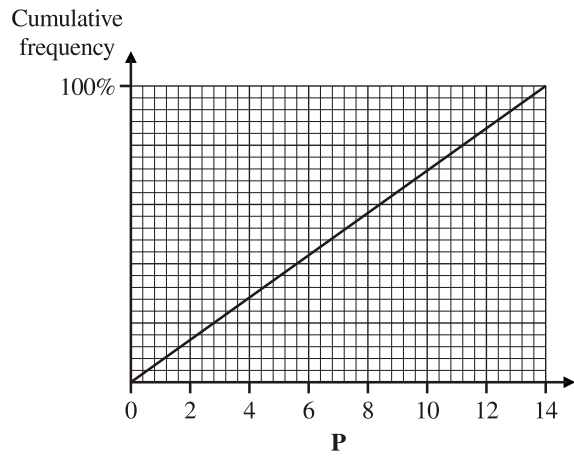
C



D



E



Question 11

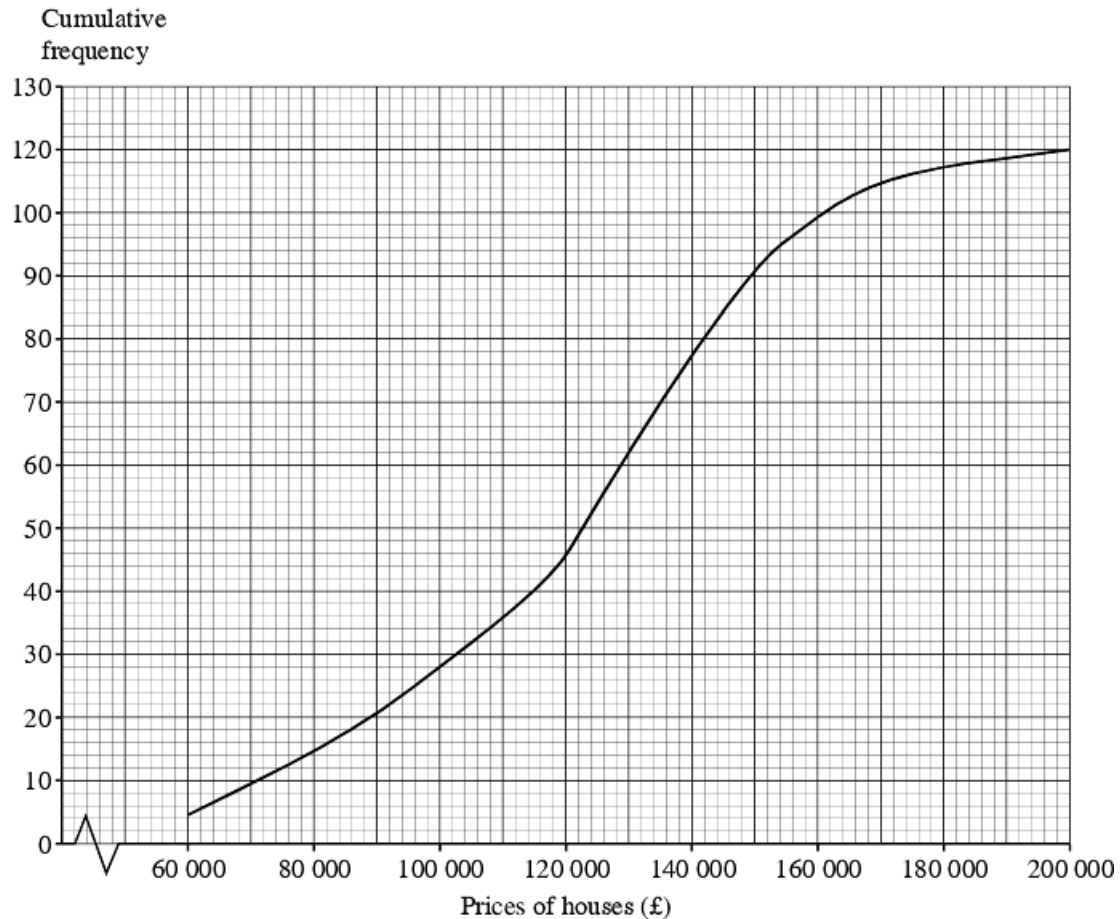
The cumulative frequency diagram opposite gives information about the prices of 120 houses.

- (a) Find an estimate for the number of houses with prices less than £130 000.

.....
(1 mark)

- (b) Work out an estimate for the interquartile range of the prices of the 120 houses.

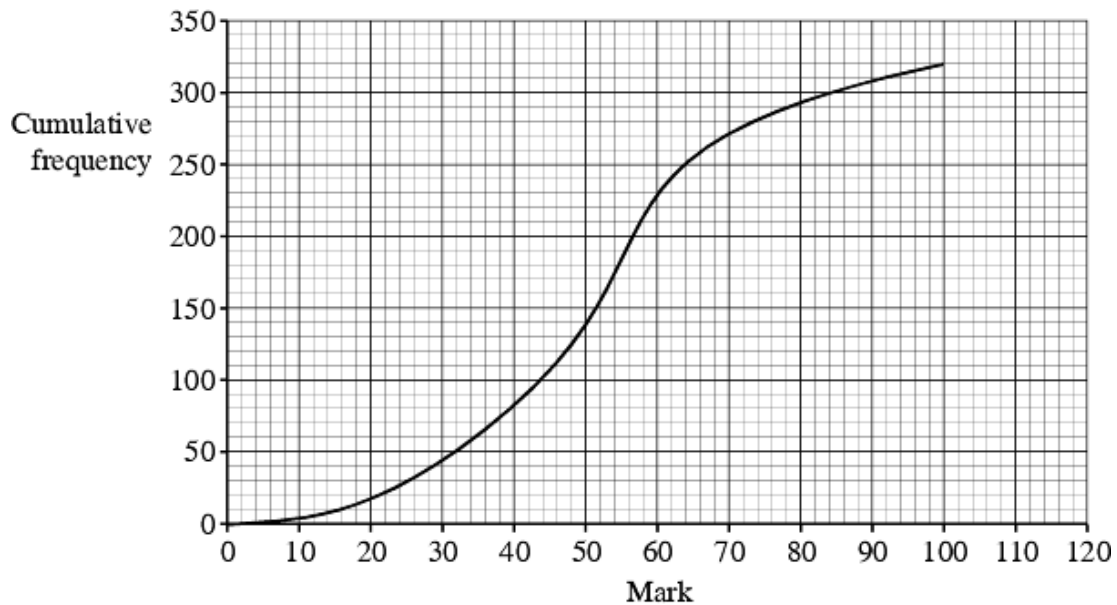
.....
(2 marks)



Question 12

320 students took a test.

The cumulative frequency graph gives information about their marks.



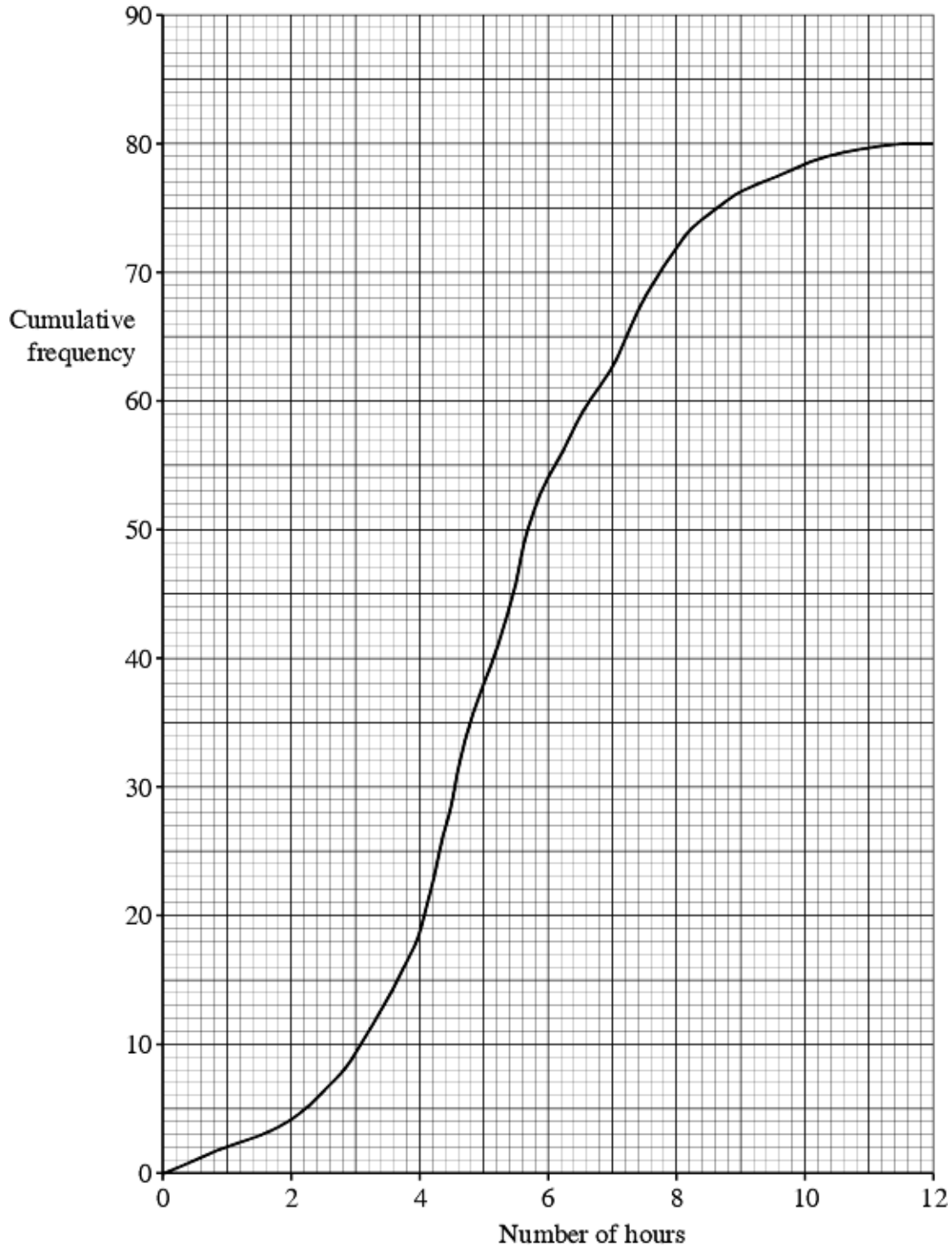
Work out an estimate for the interquartile range of their marks.

..... marks
(2 marks)

Question 13

Bill asked 80 students how many hours each of them spent doing homework last week.

He used the information to draw this cumulative frequency graph.



Use the cumulative frequency graph to find an estimate for

(i) the median number of hours, hours

(ii) the number of students who spent more than 7 hours on their homework.

.....

(3 marks)

Question 14

The table gives information about the weights, in kilograms, of 100 pigs.

Weight of pigs (w kg)	Frequency
$65 < w \leq 70$	4
$70 < w \leq 75$	10
$75 < w \leq 80$	34
$80 < w \leq 85$	32
$85 < w \leq 90$	16
$90 < w \leq 95$	4

(a) Work out the class interval which contains the median.

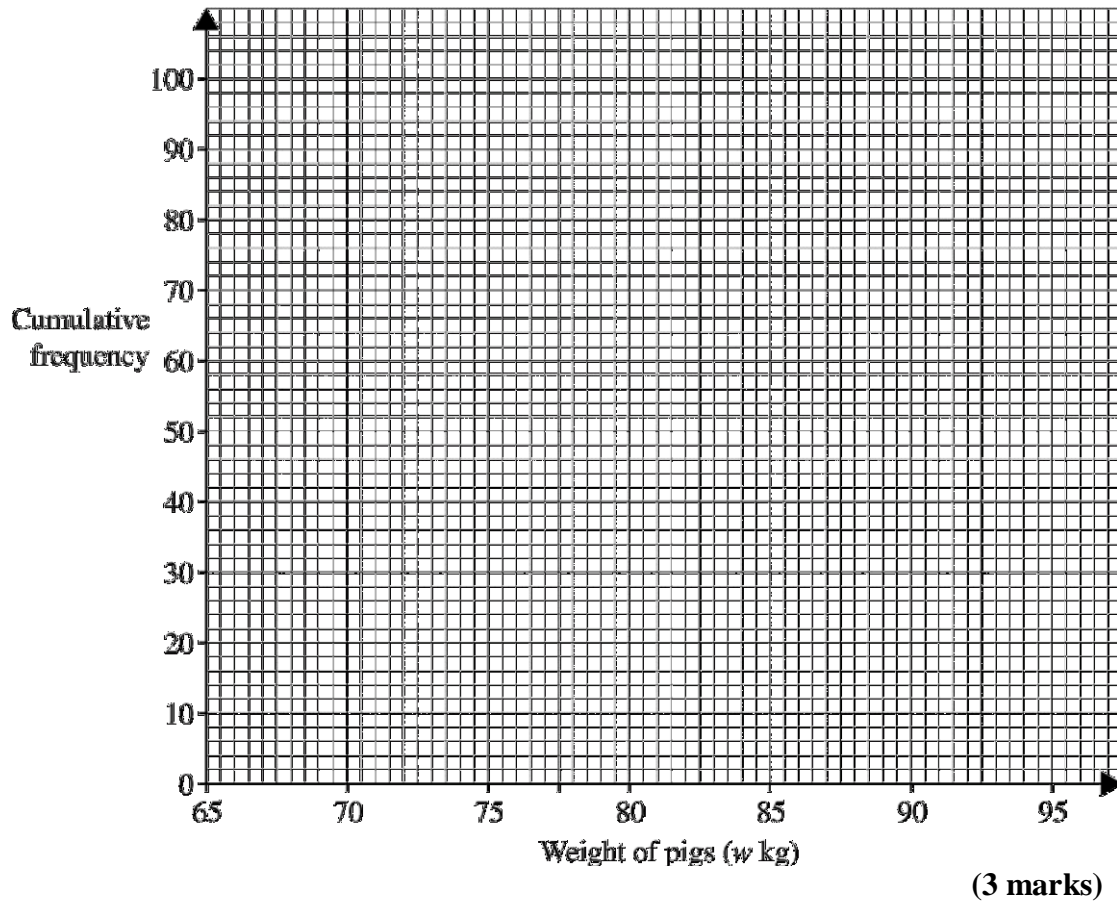
.....
(2 marks)

(b) Complete the table below to show the cumulative frequency for this data.

Weight of pigs (w kg)	Cumulative frequency
$65 < w \leq 70$	4
$65 < w \leq 75$	
$65 < w \leq 80$	
$65 < w \leq 85$	
$65 < w \leq 90$	
$65 < w \leq 95$	100

(1 mark)

(c) On the grid, draw a cumulative frequency graph for the data.



(d) Use your graph to work out an estimate for

(i) the interquartile range,

..... kg

(ii) the number of pigs which weigh **more** than 87.5 kg.

.....
(3 marks)