Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions
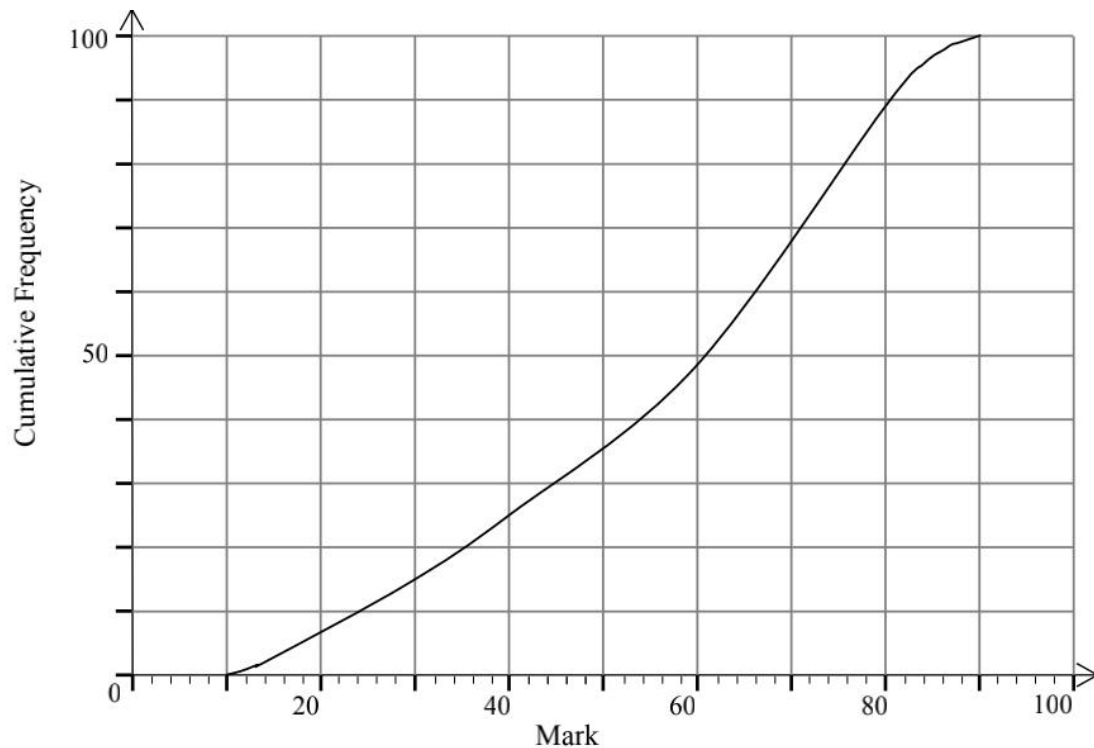
Cumulative Frequency 2

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

- Write your name in the space provided.

- Write your answers in the spaces provided in this question paper.

- Answer ALL questions.

- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

- You should have a ruler, compass and protractor where required.

Total Marks :

1) The diagram shows the cumulative frequency graph for the distribution of marks obtained by 100 students sitting for an exam.

(i) Use the cumulative frequency curve to write down an **estimate** for the:

lower quartile	upper quartile	median	interquartile range	range
_____	_____	_____	_____	_____

[2 marks]

(ii) To which **one** of the **above**, does each of the following statements apply?

" The _____ tells how spread out the central half of

the data is."

" The _____ is the middle number, which cuts off

the top half of the data from the bottom half."

" The _____ tells how spread out the data is but it is

badly affected by extreme high or low values."

[3 marks]

(iii) Grade **A** is awarded to the **top 10%** of the students. Write down an **estimate** for the **lowest** mark needed to obtain grade **A**.

Answer ....[1]

2) In a race, organisers record how long each runner takes to complete the course. The results are shown in the cumulative frequency curve below.

Time (minutes)
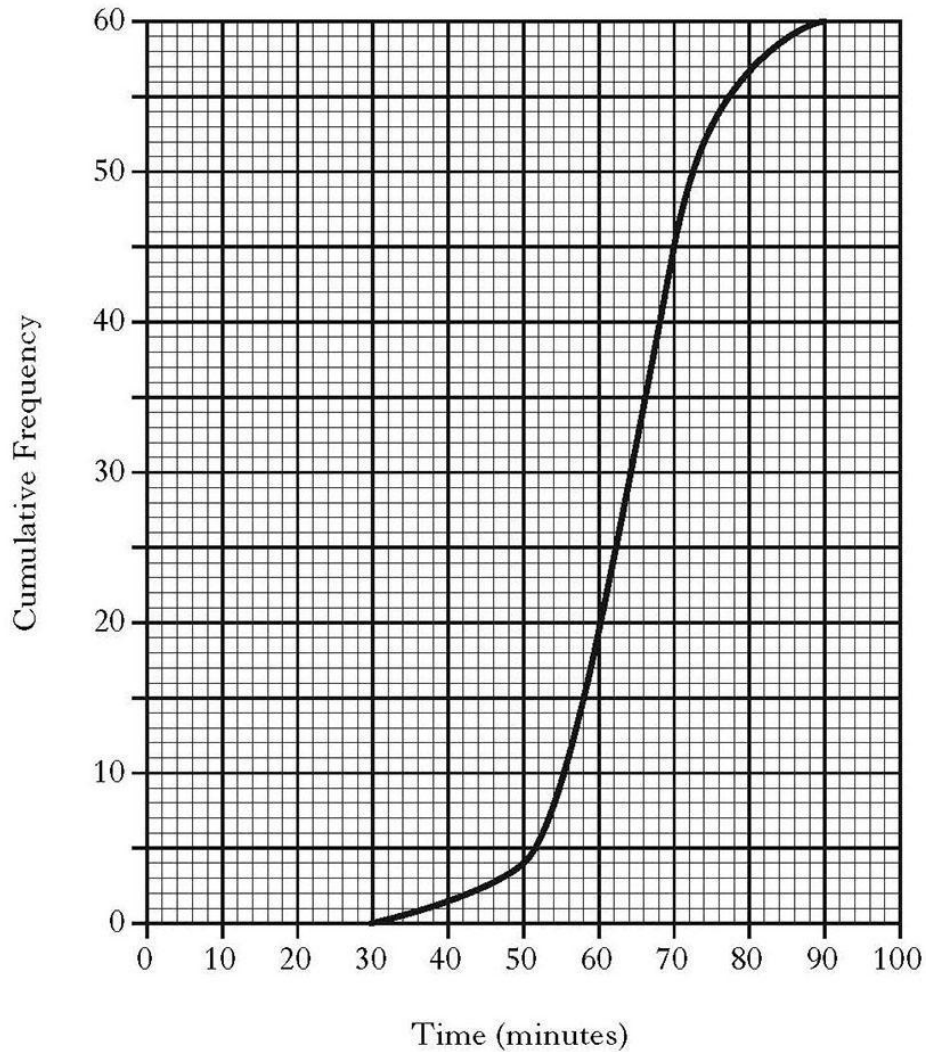
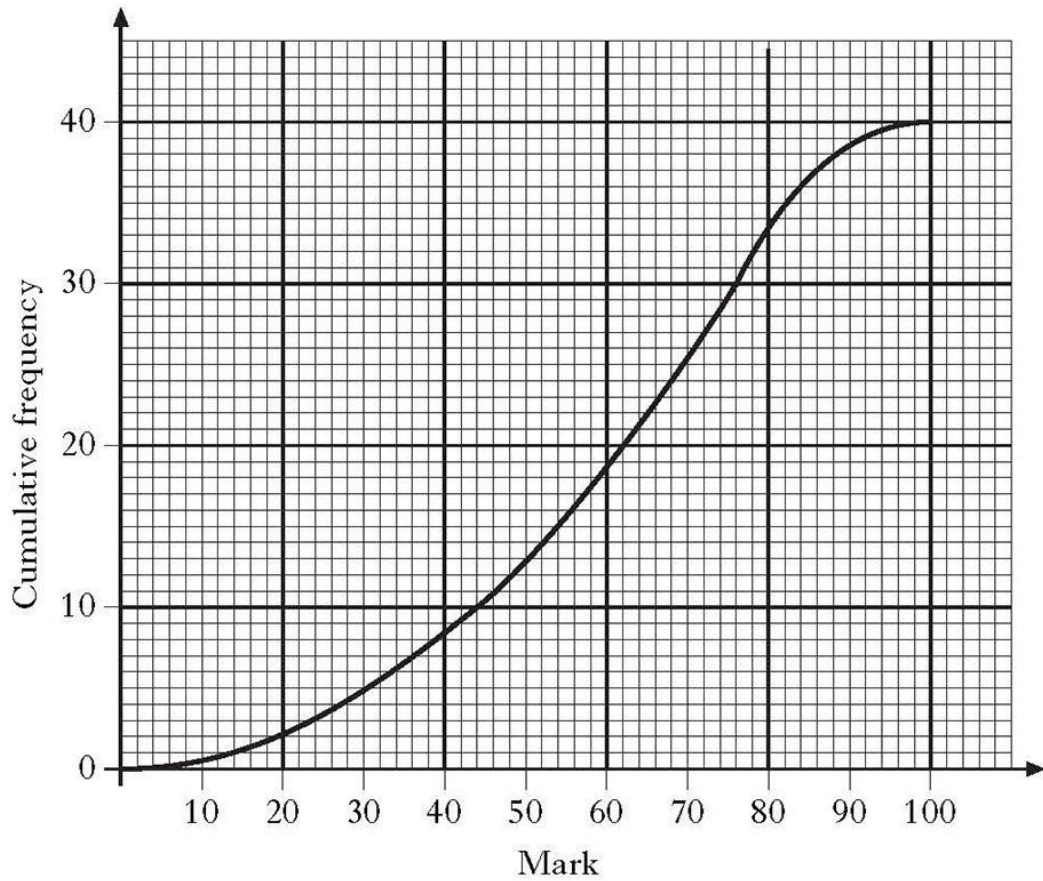(a) How many runners completed the course in 50 minutes or less?

Answer ....[1]

(b) Calculate the interquartile range for the data represented in the diagram.

Answer ....[2]

3) A group of 40 students sat a class test.
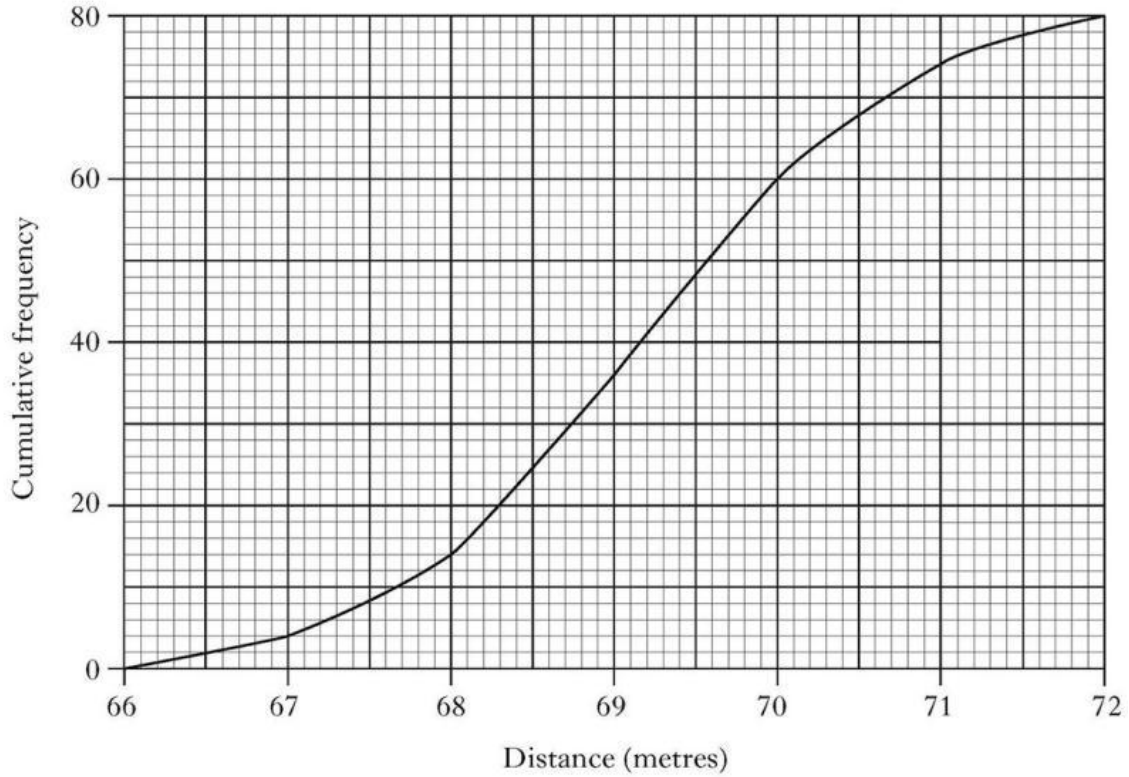   The cumulative frequency curve derived from their marks is shown below.

Calculate the interquartile range for the data represented in the diagram.

Answer ....[2]

4) During an athletics meeting, the distances of 80 attempts in the discus competition are recorded.

The cumulative frequency curve derived from the distances is shown below.
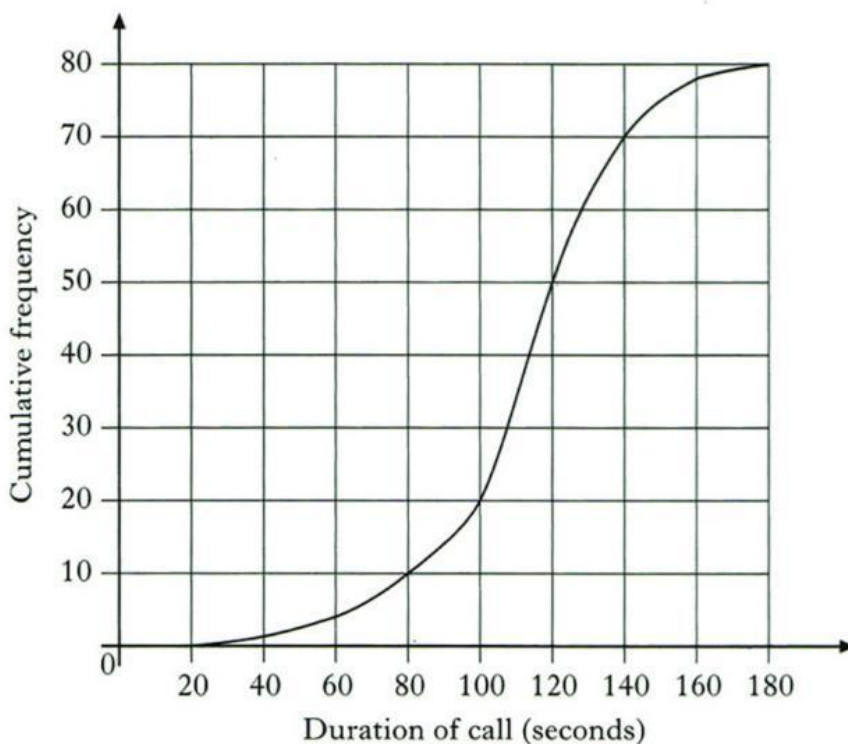

Use the curve to find the interquartile range of the distances. **3**

Answer ....

5) A call centre records the duration, in seconds, of each of 80 phone calls.
The results are shown in the cumulative frequency curve below.

Duration of call (seconds)

(a) How many calls lasted 80 seconds or less?   1

Answer.......................................calls

(b) The call centre wishes to ensure that at least 75% of calls last no longer
than 2 minutes. From the information given, has this been achieved?
Give a reason for your answer.   2

6) The cumulative frequency curves show the marks obtained by **two** classes in Year 11.
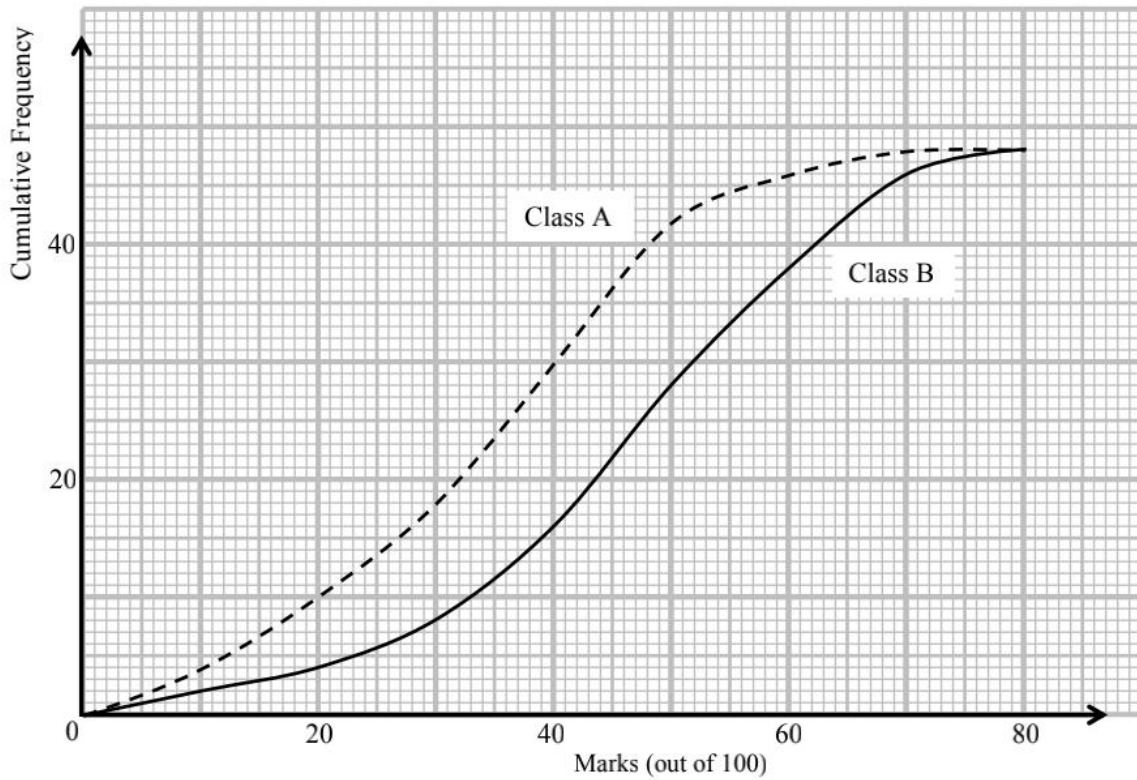
(a) Use the graphs above to estimate for each class:

   i) The median mark

                  Ans: Class A: _____, Class B: _____

   ii) The lower quartile

                  Ans: Class A: _____, Class B: _____

   iii) The upper quartile

                  Ans: Class A: _____, Class B: _____

   iv) The interquartile range

                  Ans: Class A: _____, Class B: _____

(b) Which class did better? Why?

_____

_____

(8 marks)

7) The table below shows the ages of people in a basketball club.

(i) Complete the cumulative frequency table, below on the right.

| Age (years)	Frequency	Age (y years)	Cumulative Frequency
10–19	12	< 10	0
20–29	20	<20	12
30–39	32	<30	
40–49	15	<40	
50–59	12	<50	
60–69	5	<60	
Total	**96**	<70	

(ii) On the graph paper (below) draw the **cumulative frequency graph**.

Age (years) — vertical axis from 0 to 100

Frequency — horizontal axis from 0 to 70
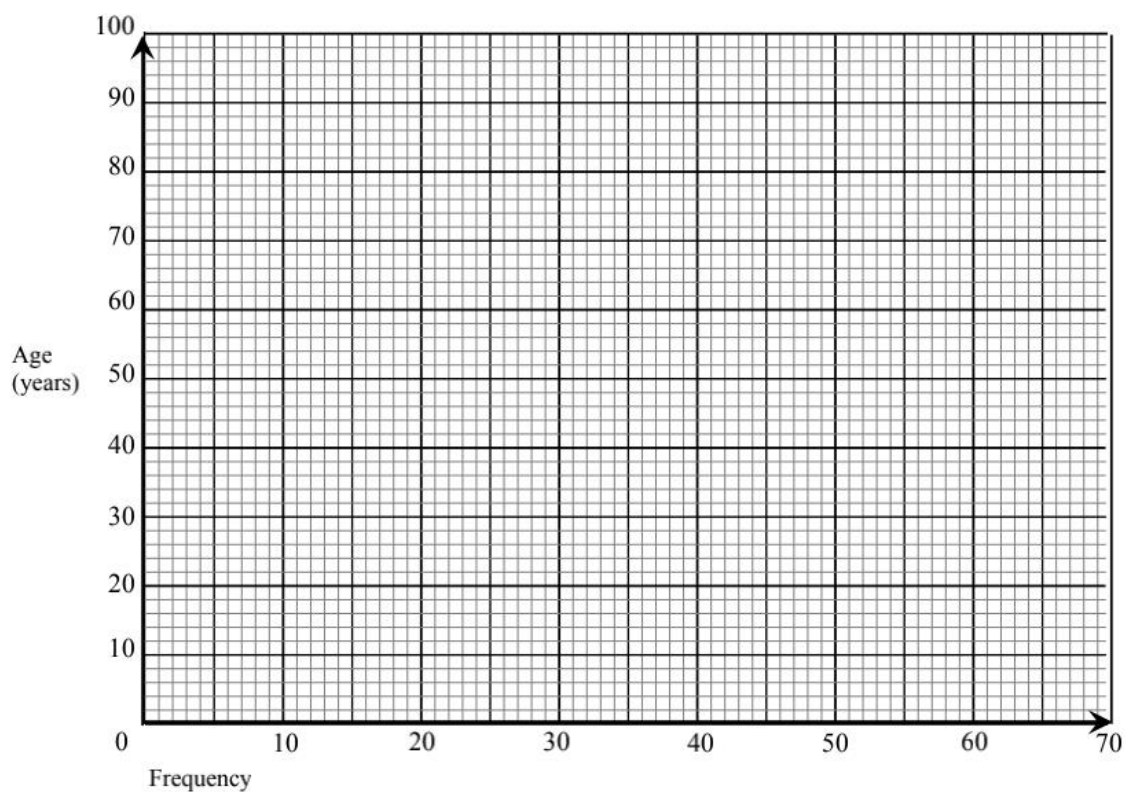
(8 marks)

8) A group of 1000 pupils sit a test marked out of 12.
The cumulative frequency curve derived from their marks is shown below.
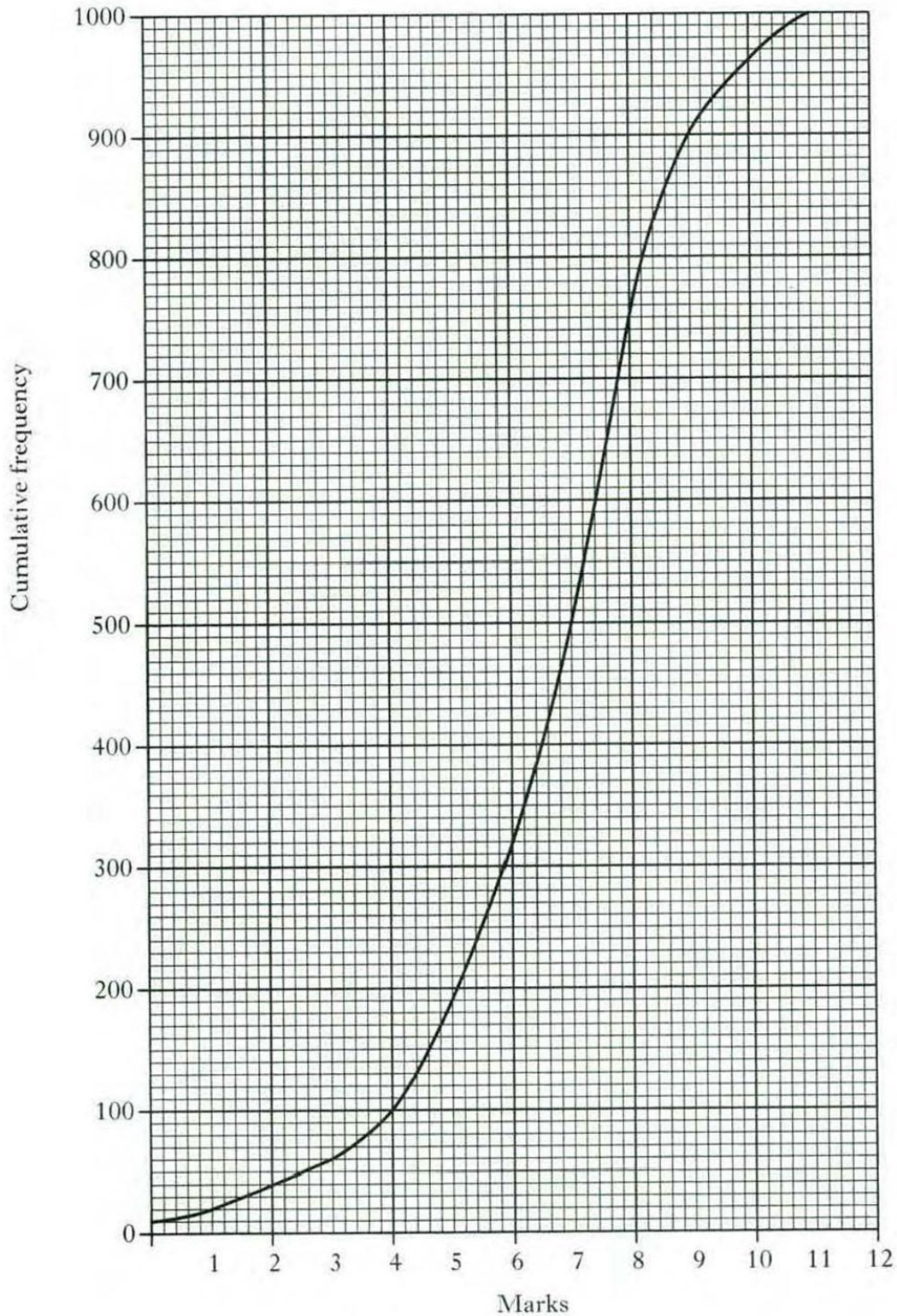
Calculate the interquartile range for the data shown above in the diagram

Answer .... [4]

9) A company which manufactures light bulbs tests the lifetime of a sample of 100 bulbs. The results are shown in the cumulative frequency curve below.
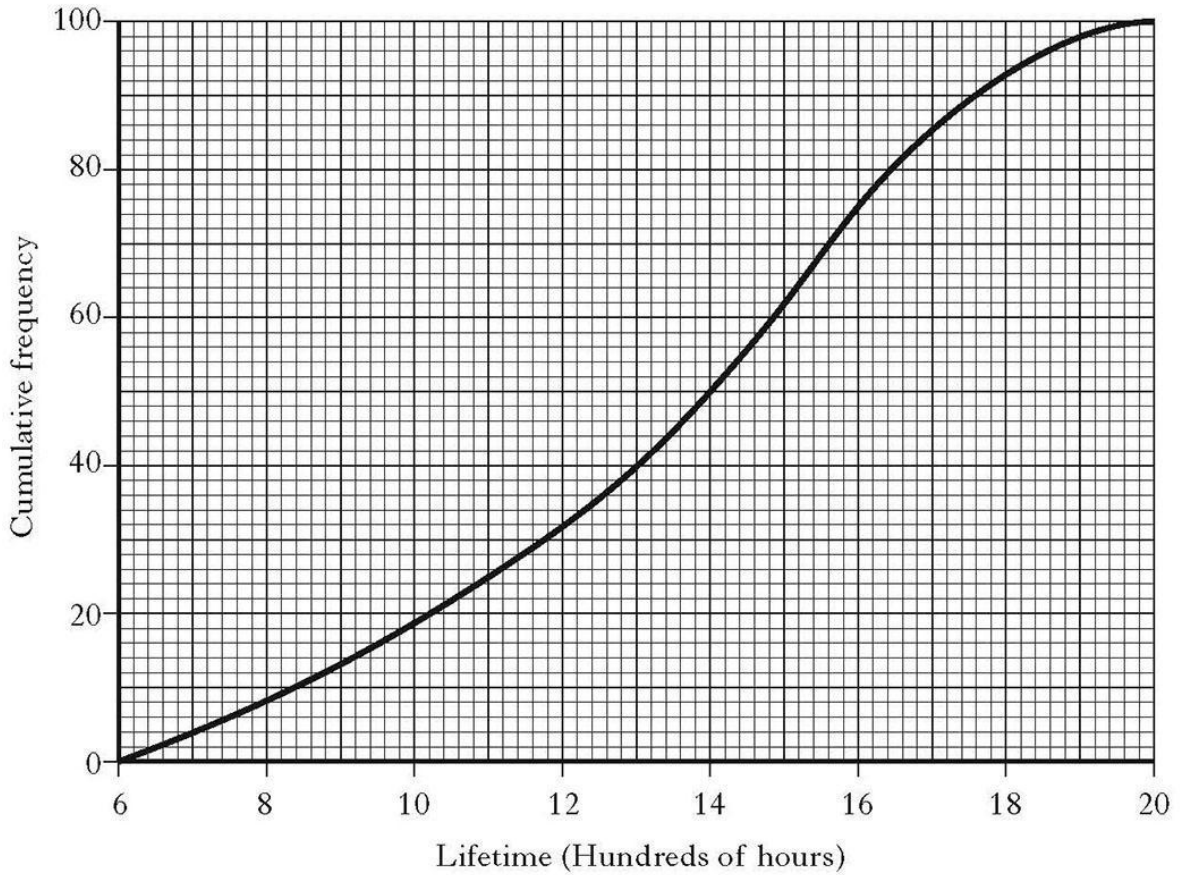
(a) State the median lifetime for the data represented in the diagram.

Answer ....[1]

(b) Calculate the interquartile range for the data represented in the diagram.

Answer ....[3]

10) In a tournament a group of golfers recorded the following scores.

$$74 \quad 70 \quad 71 \quad 73 \quad 75 \quad 71 \quad 73 \quad 72$$
$$72 \quad 75 \quad 71 \quad 76 \quad 74 \quad 72 \quad 70 \quad 73$$

Construct a cumulative frequency table and then draw a cumulative frequency graph.
Remember to label the diagram clearly.

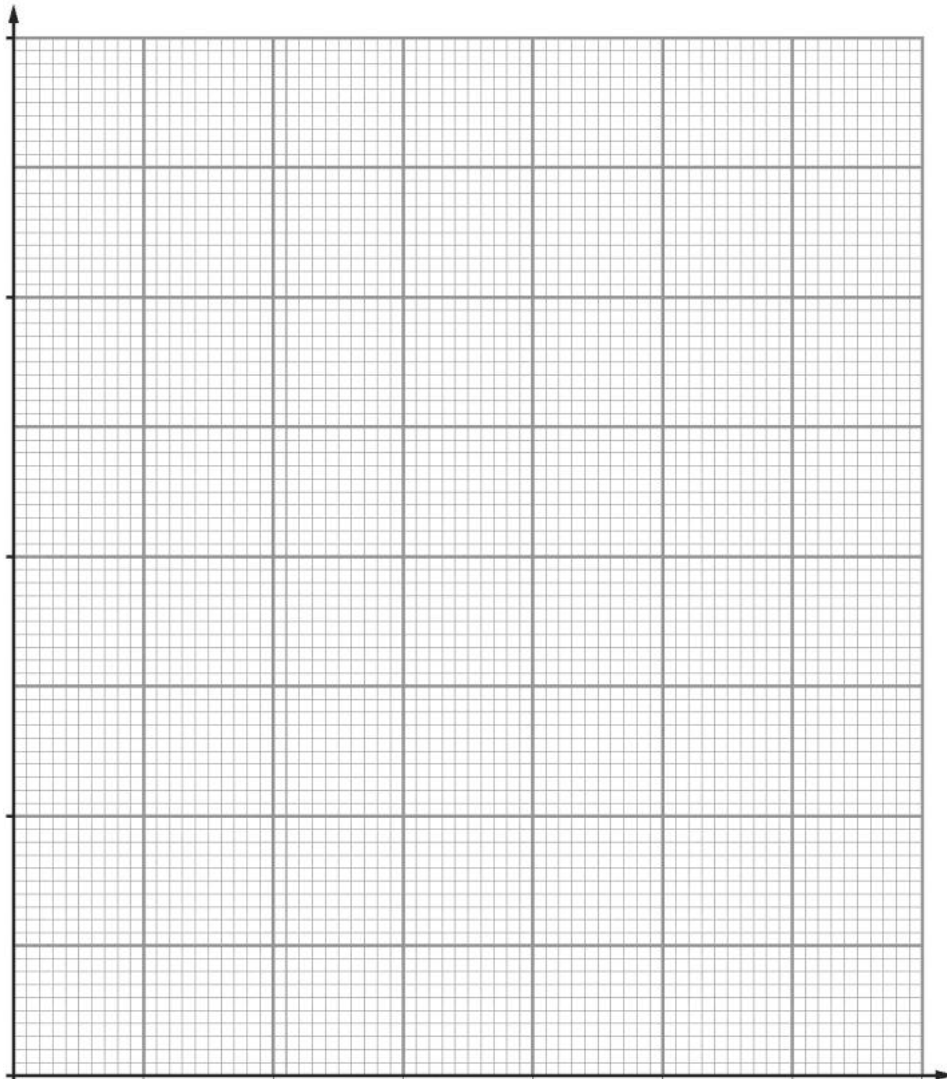| Score	Tally	Frequency	Cumulative Frequency
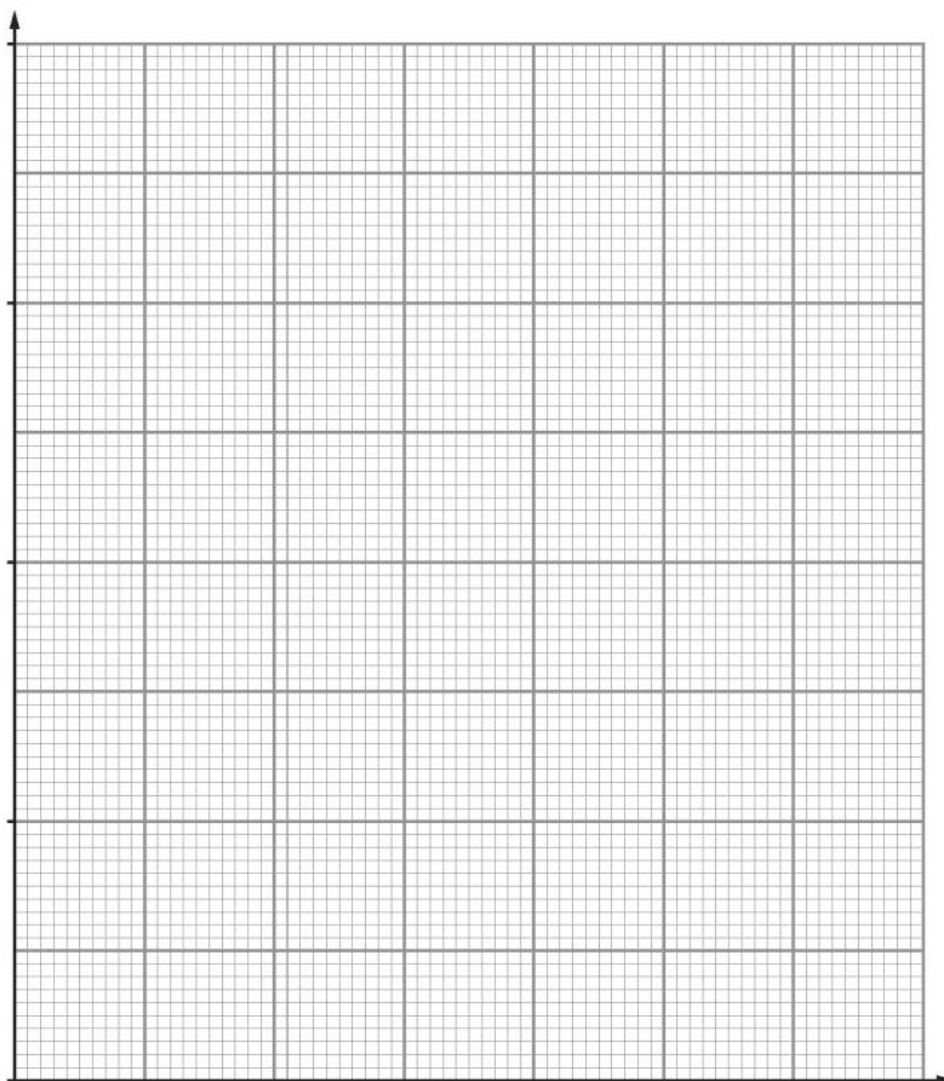
[6]

11) A group of students scored the following marks in a test.

9   5   6   8   6   9   7   8   6   5

Construct a cumulative frequency table and then draw a cumulative frequency graph. Remember to label the diagram clearly.

[6]

12) The speeds in km/h of a number of cars travelling on a motorway were measured. The results are shown in the table below.

Speed (km/h)	Frequency	Cumulative frequency
0 < s ≤ 30	2	
30 < s ≤ 45	7	
45 < s ≤ 60	17	
60 < s ≤ 75	22	
75 < s ≤ 90	12	
90 < s ≤ 105	6	
105 < s ≤ 120	4	

a) Draw a cumulative frequency graph for this data on the grid on the next page.

b) Use your graph to find an estimate of:
   (i) the median speed

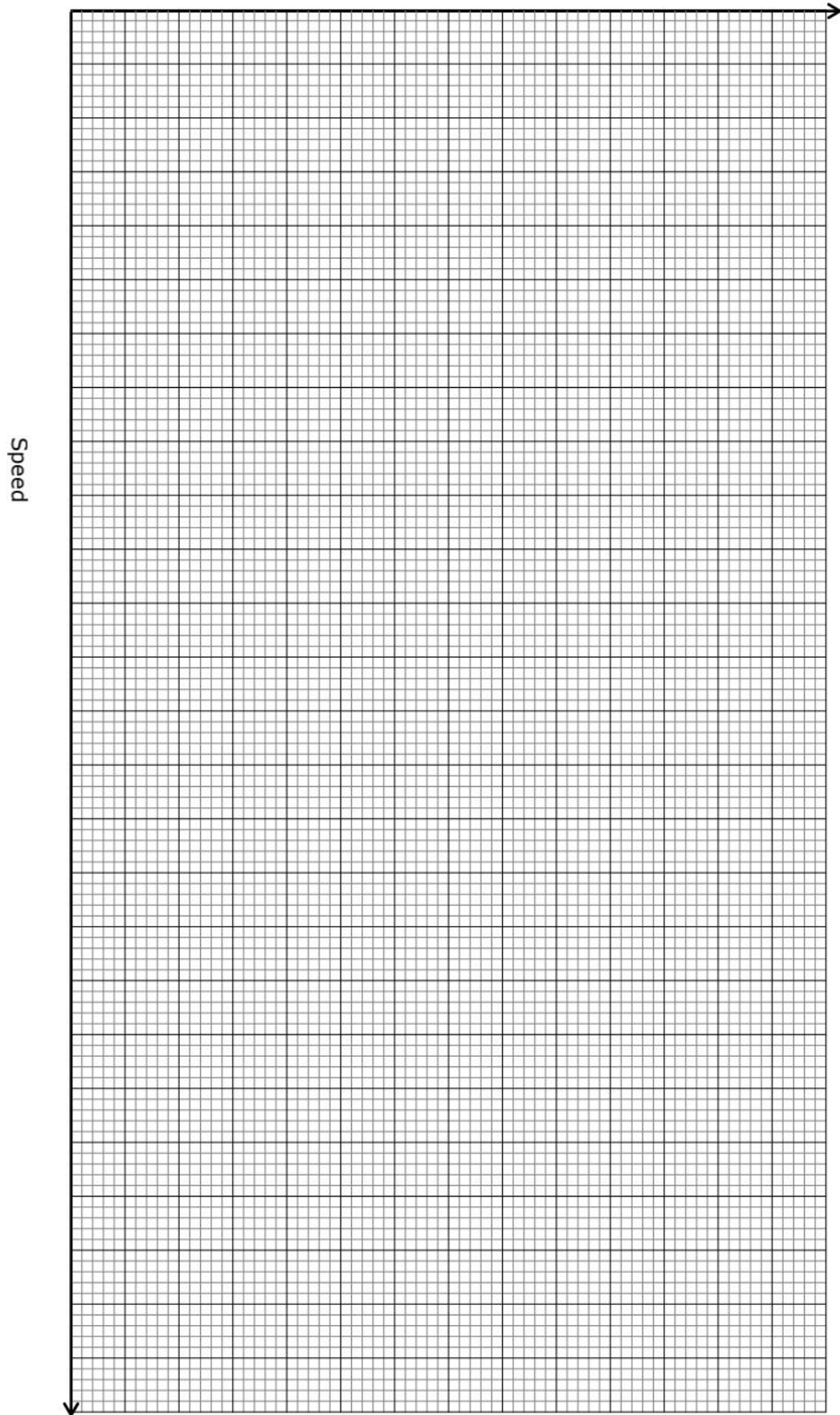Ans: _____

   (ii) the interquartile range

Ans: _____

   (iii) the percentage of cars travelling at more than 80 km/h.

Ans: _____

(9 marks)

Cumulative frequency

Speed

13) The incomplete table on the right shows the percentage of used paper that was recycled by a group of countries in 2013.

The graph below shows the cumulative frequency curve for this data.

Percentage (p) of used paper that was recycled	Frequency	Cumulative Frequency
0% < p ≤ 10%	12	12
10% < p ≤ 20%	15	27
20% < p ≤ 30%	13	40
30% < p ≤ 40%		
40% < p ≤ 50%		
50% < p ≤ 60%		
60% < p ≤ 70%	1	60

Cumulative Frequency

Percentage of used paper that was recycled (%)
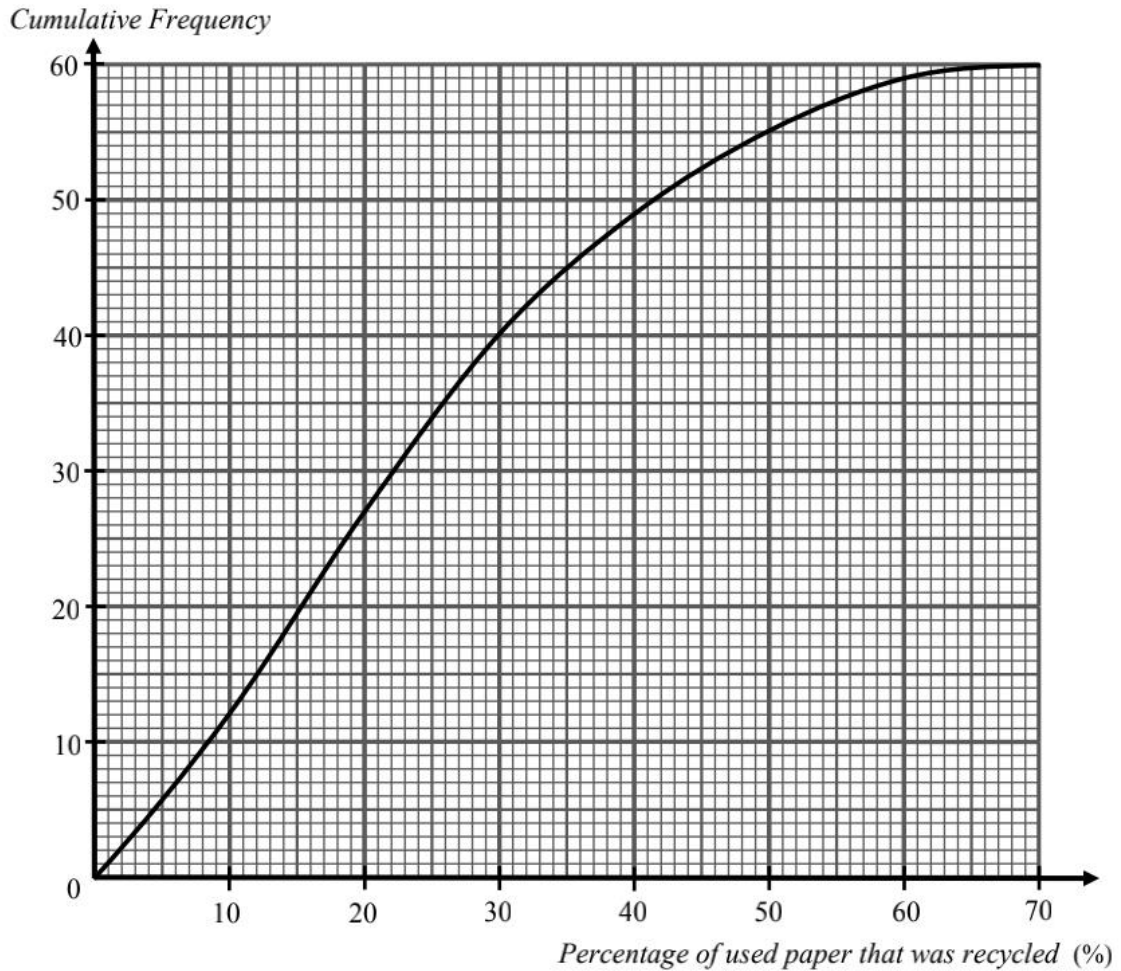
a) Use the curve to complete the table above.

b) How many countries were considered in this data?

Answer ....

c) Use the curve to estimate the median percentage of used paper that was recycled.

Ans: _____

d) Germany was one of the countries considered in the data above. It recycled 65% of its used paper. Can it be stated that Germany was the country which recycled **most** used paper in the group? Explain.

_____

_____

_____ (7 marks)

14) Diagrams A and B show a histogram and a cumulative frequency curve respectively.
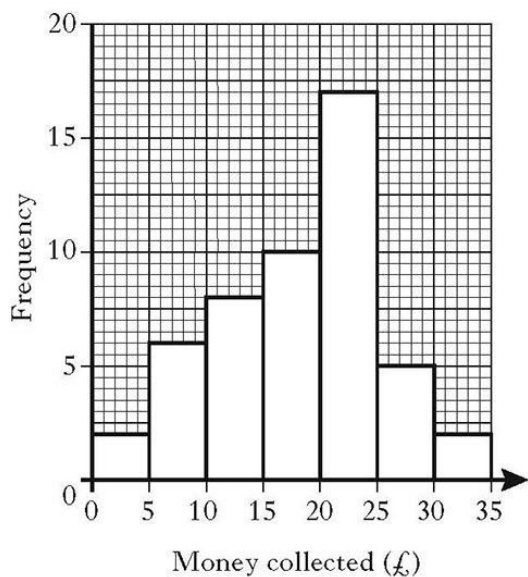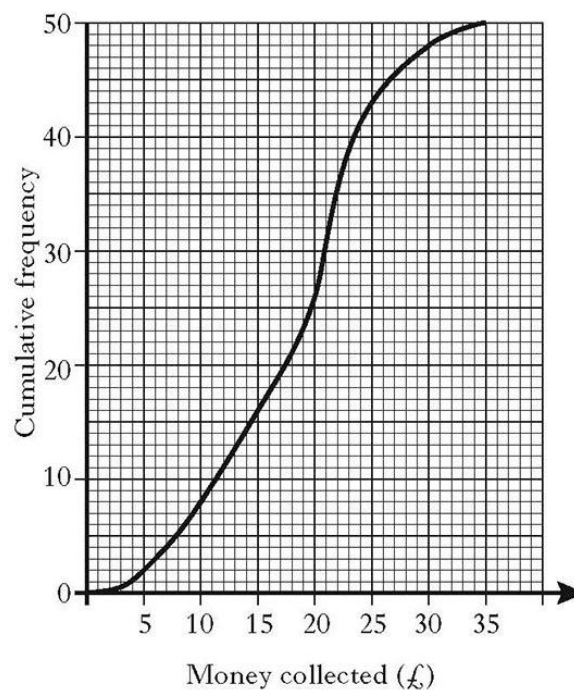
Diagram A   **Diagram B**

(a) Using the data in Diagram A, copy and complete the frequency table below.

Money collected (£)			Frequency
0·01	–	5·00	
5·01	–	10·00	
10·01	–	15·00	
15·01	–	20·00	
20·01	–	25·00	
25·01	–	30·00	
30·01	–	35·00	

1

(b) Jim thinks that both Diagram A and Diagram B may have been drawn using the same set of data.

Is he correct?

Explain your answer, showing all your evidence.   **2**