

Statistics

Difficulty: Medium

Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Statistics
Paper	Paper 4
Difficulty	Medium
Booklet	Question Paper 1

Time allowed: 114 minutes

Score: /99

Percentage: /100

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

Question 1

120 students take a mathematics examination.

(a) The time taken, m minutes, for each student to answer question 1 is shown in this table.

Time (m minutes)	$0 < m \leq 1$	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 4$	$4 < m \leq 5$	$5 < m \leq 6$
Frequency	72	21	9	11	5	2

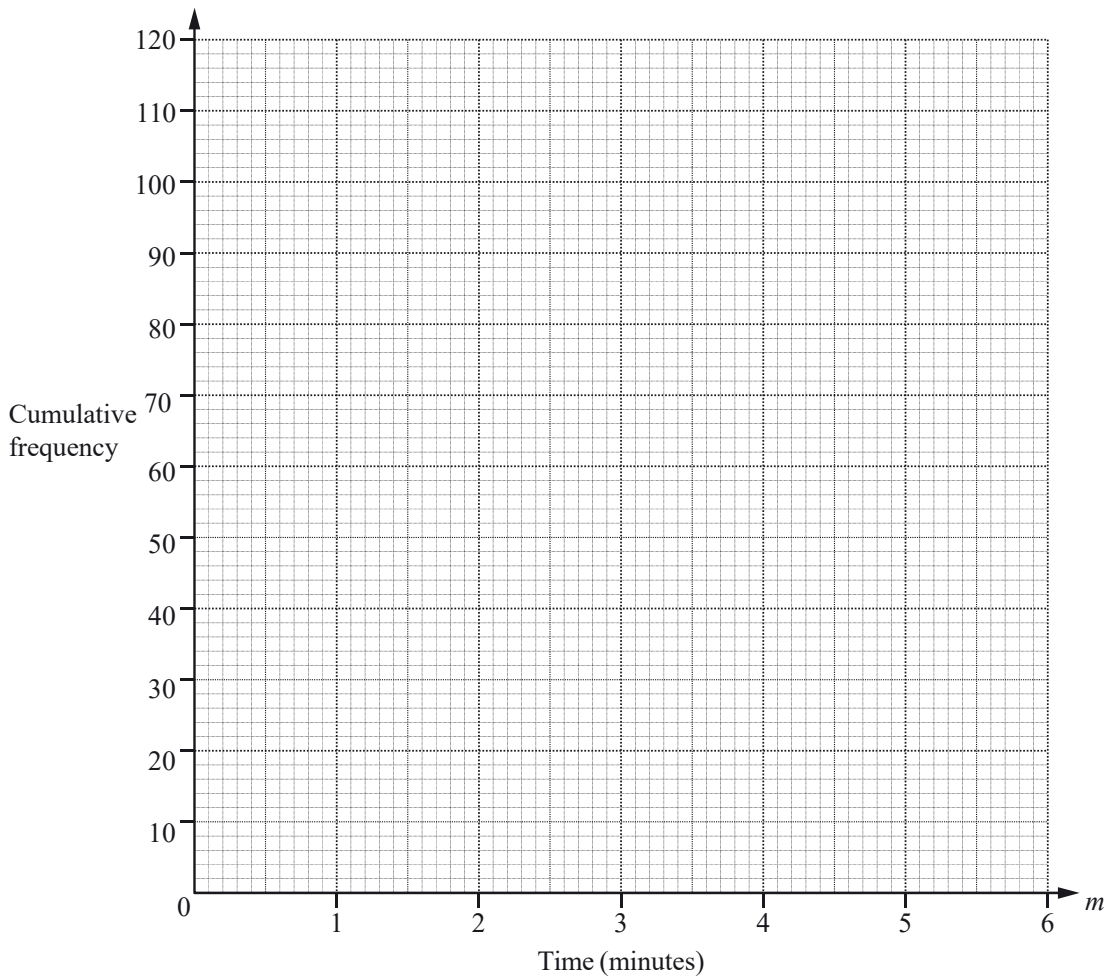
Calculate an estimate of the mean time taken. [4]

(b) (i) Using the table in **part (a)**, complete this cumulative frequency table.

Time (m minutes)	$m \leq 1$	$m \leq 2$	$m \leq 3$	$m \leq 4$	$m \leq 5$	$m \leq 6$
Cumulative frequency	72					120

[2]

(ii) Draw a cumulative frequency diagram to show the time taken.



[3]

(iii) Use your cumulative frequency diagram to find

(a) the median, [1]

(b) the inter-quartile range, [2]

(c) the 35th percentile. [2]

(c) A new frequency table is made from the table shown in **part (a)**.

Time (m minutes)	$0 < m \leq 1$	$1 < m \leq 3$	$3 < m \leq 6$
Frequency	72		

(i) Complete the table above. [2]

(ii) A histogram was drawn and the height of the first block representing the time $0 < m \leq 1$ was 3.6 cm.

Calculate the heights of the other two blocks.

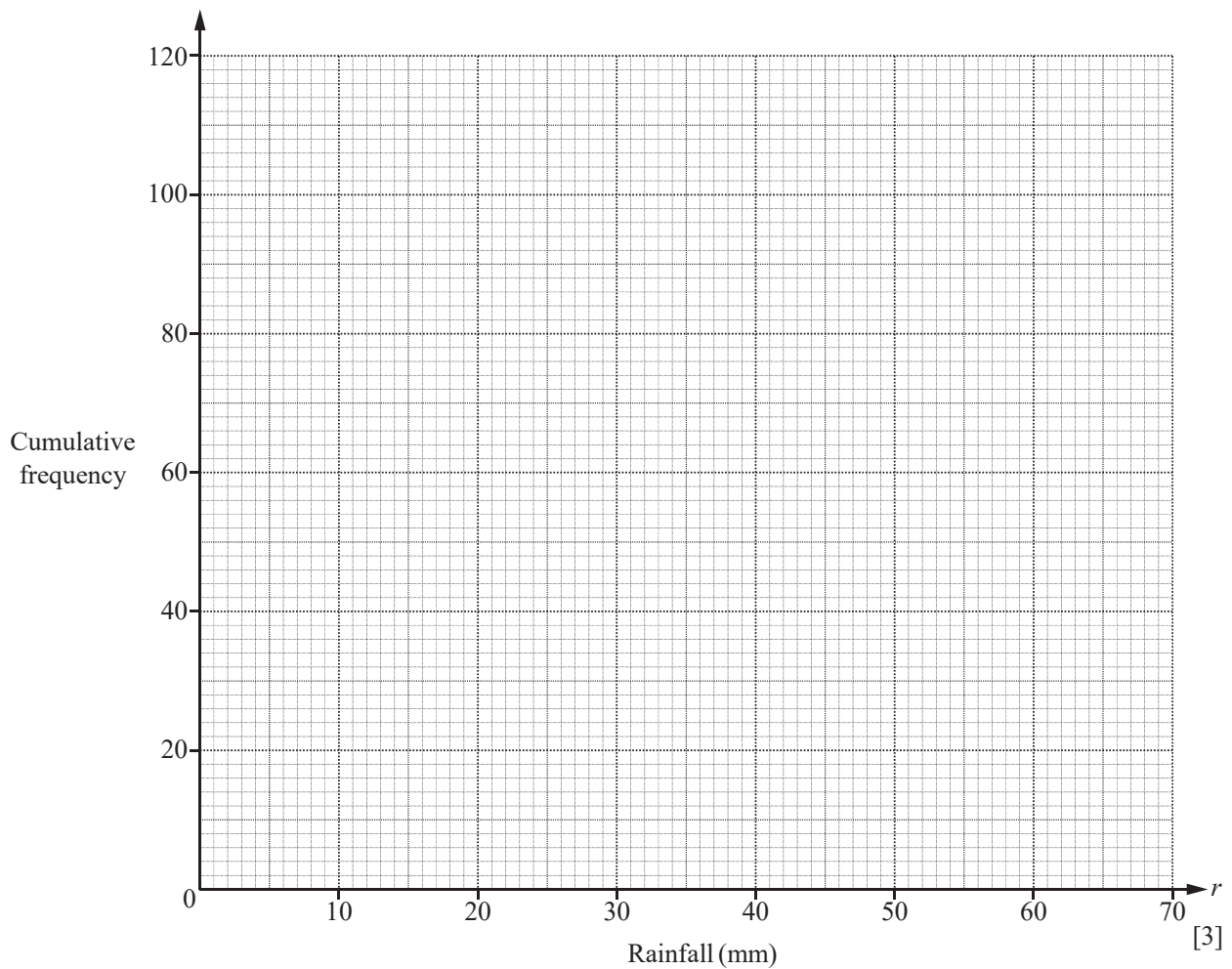
[3]

Question 2

Leo measured the rainfall each day, in millimetres, for 120 days.
The cumulative frequency table shows the results.

Rainfall (r mm)	$r \leq 20$	$r \leq 25$	$r \leq 35$	$r \leq 40$	$r \leq 60$	$r \leq 70$
Cumulative frequency	5	13	72	90	117	120

(a) On the grid below, draw a cumulative frequency diagram to show these results.



(b) (i) Find the median. [1]

(ii) Use your diagram to find the number of days when the rainfall was more than 50mm. [2]

(c) Use the information in the cumulative frequency table to complete the frequency table below.

Rainfall (r mm)	$0 < r \leq 20$	$20 < r \leq 25$	$25 < r \leq 35$	$35 < r \leq 40$	$40 < r \leq 60$	$60 < r \leq 70$
Frequency	5		59			3

[2]

(d) Use your frequency table to calculate an estimate of the mean.

You must show all your working.

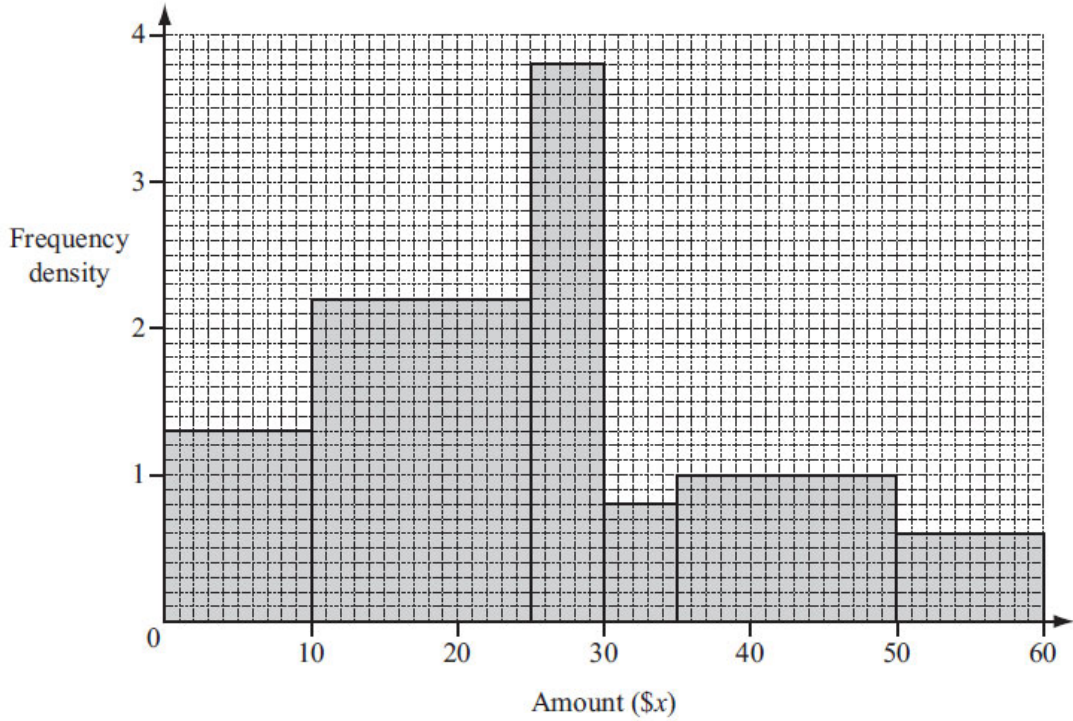
[4]

(e) In a histogram drawn to show the information in the table in **part (c)**, the frequency density for the interval $25 < r \leq 35$ is 5.9 .

Calculate the frequency density for the intervals $20 < r \leq 25$, $40 < r \leq 60$ and $60 < r \leq 70$.

[4]

Question 3



A survey asked 90 people how much money they gave to charity in one month. The histogram shows the results of the survey.

(a) Complete the frequency table for the six columns in the histogram.

[5]

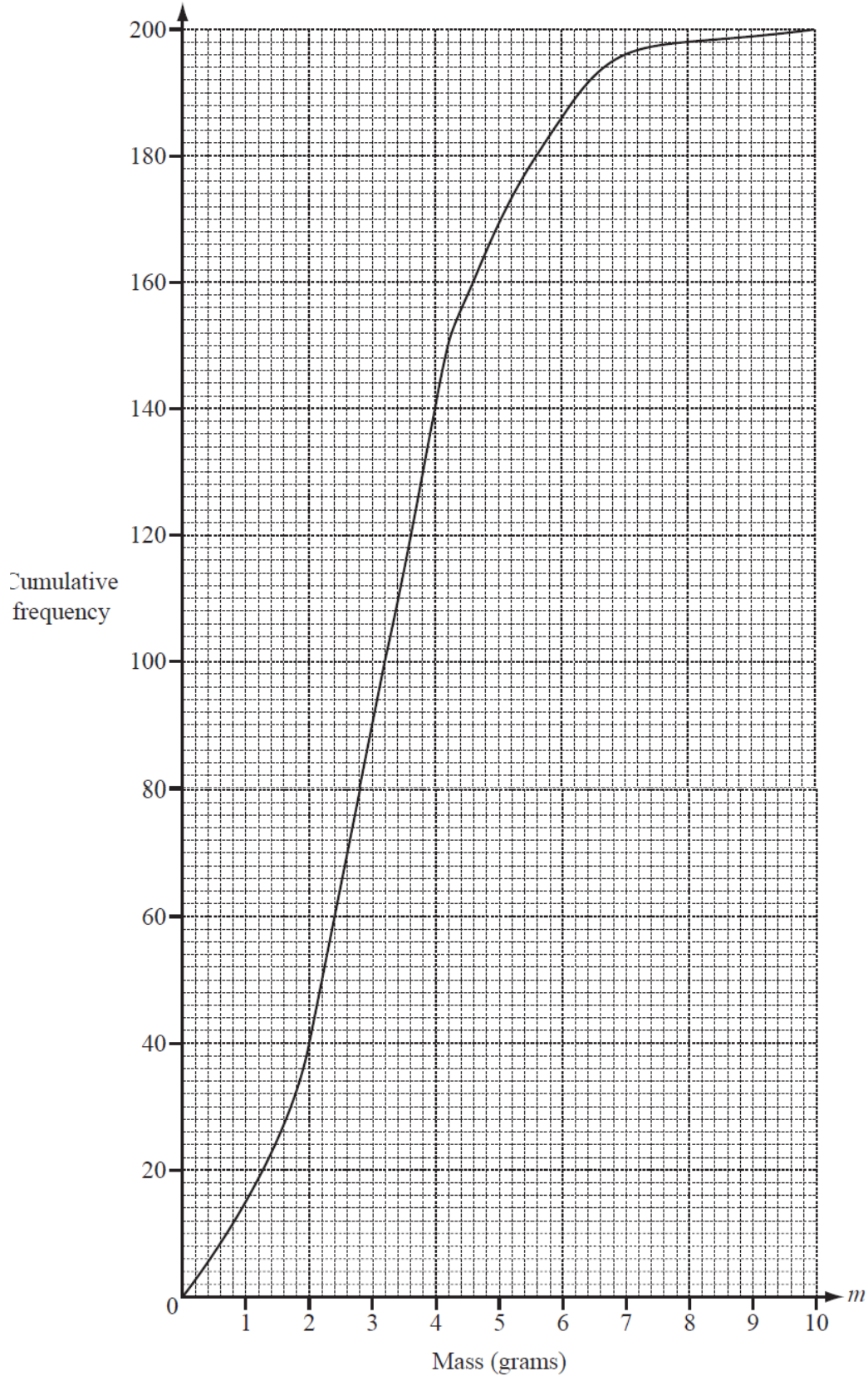
Amount (\$x)	$0 < x \leq 10$					
Frequency			4			

(b) Use your frequency table to calculate an estimate of the mean amount these 90 people gave to charity.

[4]

Question 4

200 students estimate the mass (m grams) of a coin.
The cumulative frequency diagram shows the results.



(a) Find

(i) the median, [1]

(ii) the upper quartile, [1]

(iii) the 80th percentile, [1]

(iv) the number of students whose estimate is 7 g or less. [1]

(b) (i) Use the cumulative frequency diagram to complete the frequency table. [2]

Mass (m grams)	$0 < m \leq 2$	$2 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 8$	$8 < m \leq 10$
Frequency	40				2

(ii) A student is chosen at random.
The probability that the student estimates that the mass is greater than M grams is 0.3.

Find the value of M . [2]

Question 5

- (a) A farmer takes a sample of 158 potatoes from his crop. He records the mass of each potato and the results are shown in the table.

Mass (m grams)	Frequency
$0 < m \leq 40$	6
$40 < m \leq 80$	10
$80 < m \leq 120$	28
$120 < m \leq 160$	76
$160 < m \leq 200$	22
$200 < m \leq 240$	16

Calculate an estimate of the mean mass.
Show all your working.

[4]

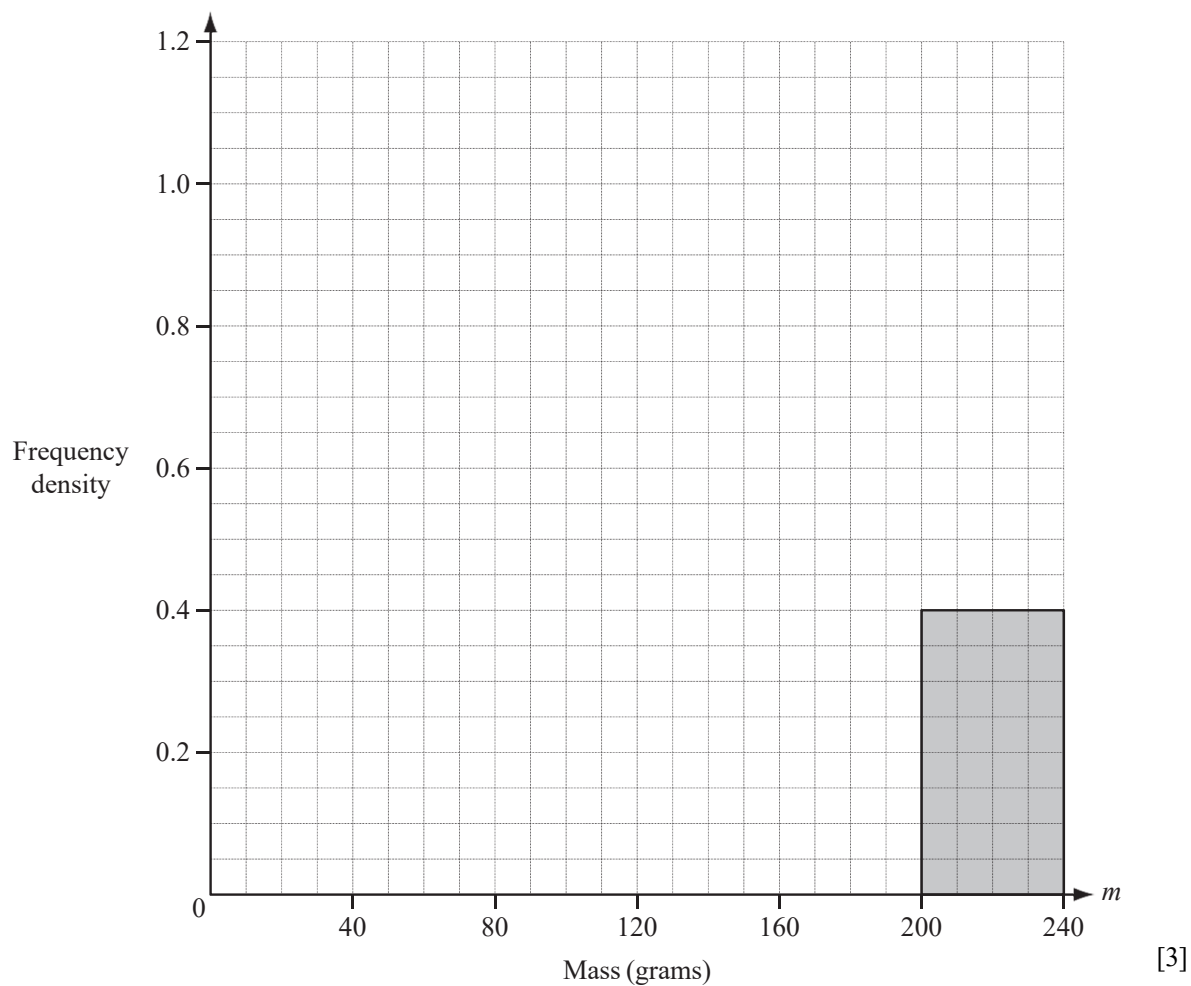
- (b) A new frequency table is made from the results shown in the table in part (a).

Mass (m grams)	Frequency
$0 < m \leq 80$	
$80 < m \leq 200$	
$200 < m \leq 240$	16

(i) Complete the table above.

[2]

(ii) On the grid opposite, complete the histogram to show the information in this new table.



- (c) A bag contains 15 potatoes which have a mean mass of 136 g.
The farmer puts 3 potatoes which have a mean mass of 130 g into the bag.

Calculate the mean mass of all the potatoes in the bag.

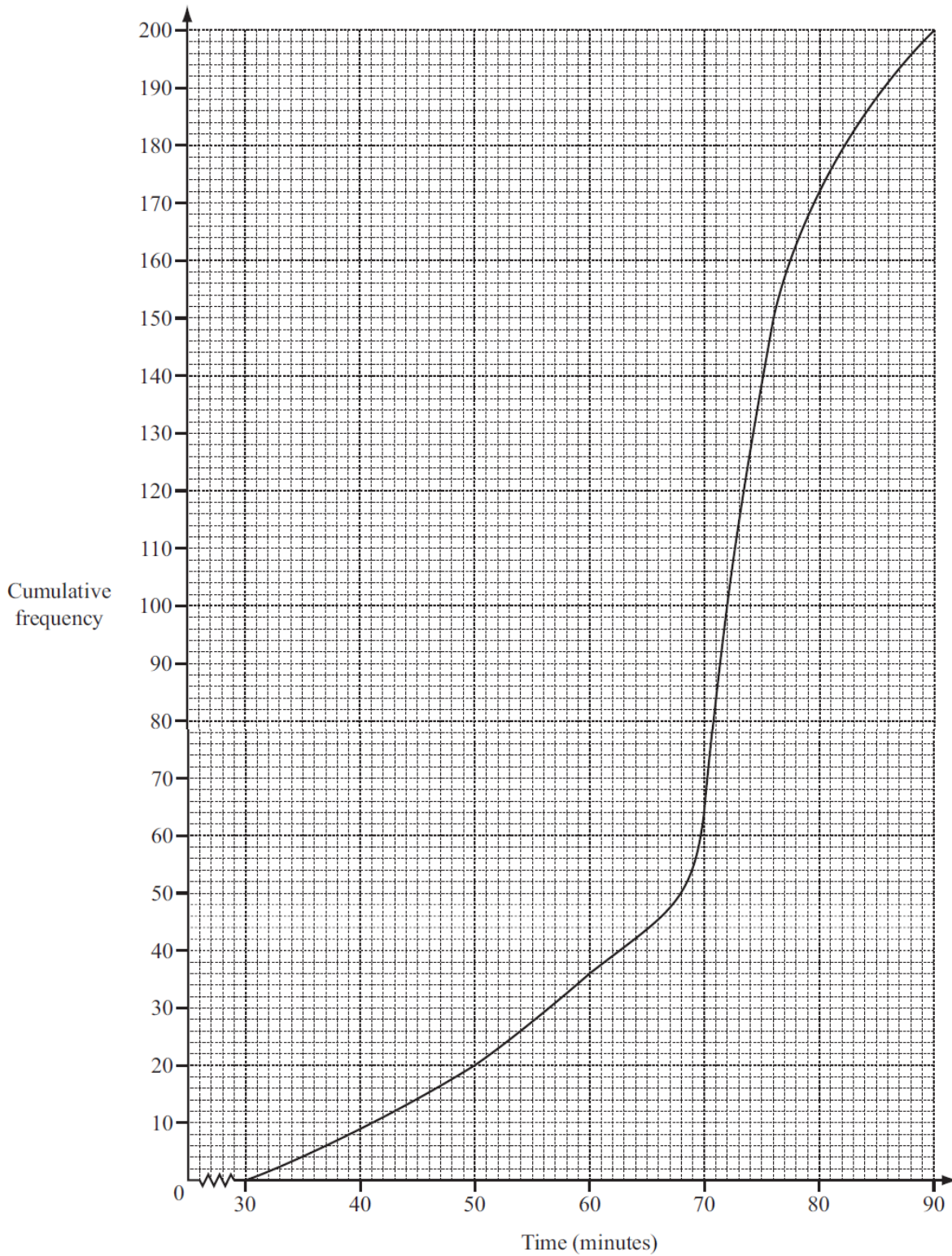
[3]

[3]

Question 6

200 students take a Mathematics examination.

The cumulative frequency diagram shows information about the times taken, t minutes, to complete the examination.



(a) Find

(i) the median, [1]

(ii) the lower quartile, [1]

(iii) the inter-quartile range, [1]

(iv) the number of students who took more than 1 hour. [2]

(b) (i) Use the cumulative frequency diagram to complete the grouped frequency table.

Time, t minutes	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 90$
Frequency	9		16	28	108	28

[1]

(ii) Calculate an estimate of the mean time taken by the 200 students to complete the examination.
Show all your working.

[4]

Question 7

(a) In a football league a team is given 3 points for a win, 1 point for a draw and 0 points for a loss.

The table shows the 20 results for Athletico Cambridge.

Points	3	1	0
Frequency	10	3	7

(i) Find the median and the mode. [3]

(ii) Thomas wants to draw a pie chart using the information in the table.

Calculate the angle of the sector which shows the number of times Athletico Cambridge were given 1 point. [2]

(b) Athletico Cambridge has 20 players.

The table shows information about the heights (h centimetres) of the players.

Height (h cm)	$170 < h \leq 180$	$180 < h \leq 190$	$190 < h \leq 200$
Frequency	5	12	3

Calculate an estimate of the mean height of the players. [4]

Question 8

(a) The times, t seconds, for 200 people to solve a problem are shown in the table.

Time (t seconds)	Frequency
$0 < t \leq 20$	6
$20 < t \leq 40$	12
$40 < t \leq 50$	20
$50 < t \leq 60$	37
$60 < t \leq 70$	42
$70 < t \leq 80$	50
$80 < t \leq 90$	28
$90 < t \leq 100$	5

Calculate an estimate of the mean time.

[4]

(b) (i) Complete the cumulative frequency table for this data.

[2]

Time (t seconds)	$t \leq 20$	$t \leq 40$	$t \leq 50$	$t \leq 60$	$t \leq 70$	$t \leq 80$	$t \leq 90$	$t \leq 100$
Cumulative Frequency	6	18	38			167		

(ii) Draw the cumulative frequency graph on the grid opposite to show this data.

[4]

(c) Use your cumulative frequency graph to find

(i) the median time,

[1]

(ii) the lower quartile,

[1]

(iii) the inter-quartile range,

[1]

(iv) how many people took between 65 and 75 seconds to solve the problem,

[1]

(v) how many people took longer than 45 seconds to solve the problem.

[2]

