Statistics
Difficulty: Hard

Question Paper 4

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

Time allowed: 107 minutes

Score: /93

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%

Sam asked 80 people how many minutes their journey to work took on one day.
The cumulative frequency diagram shows the times taken (m minutes).
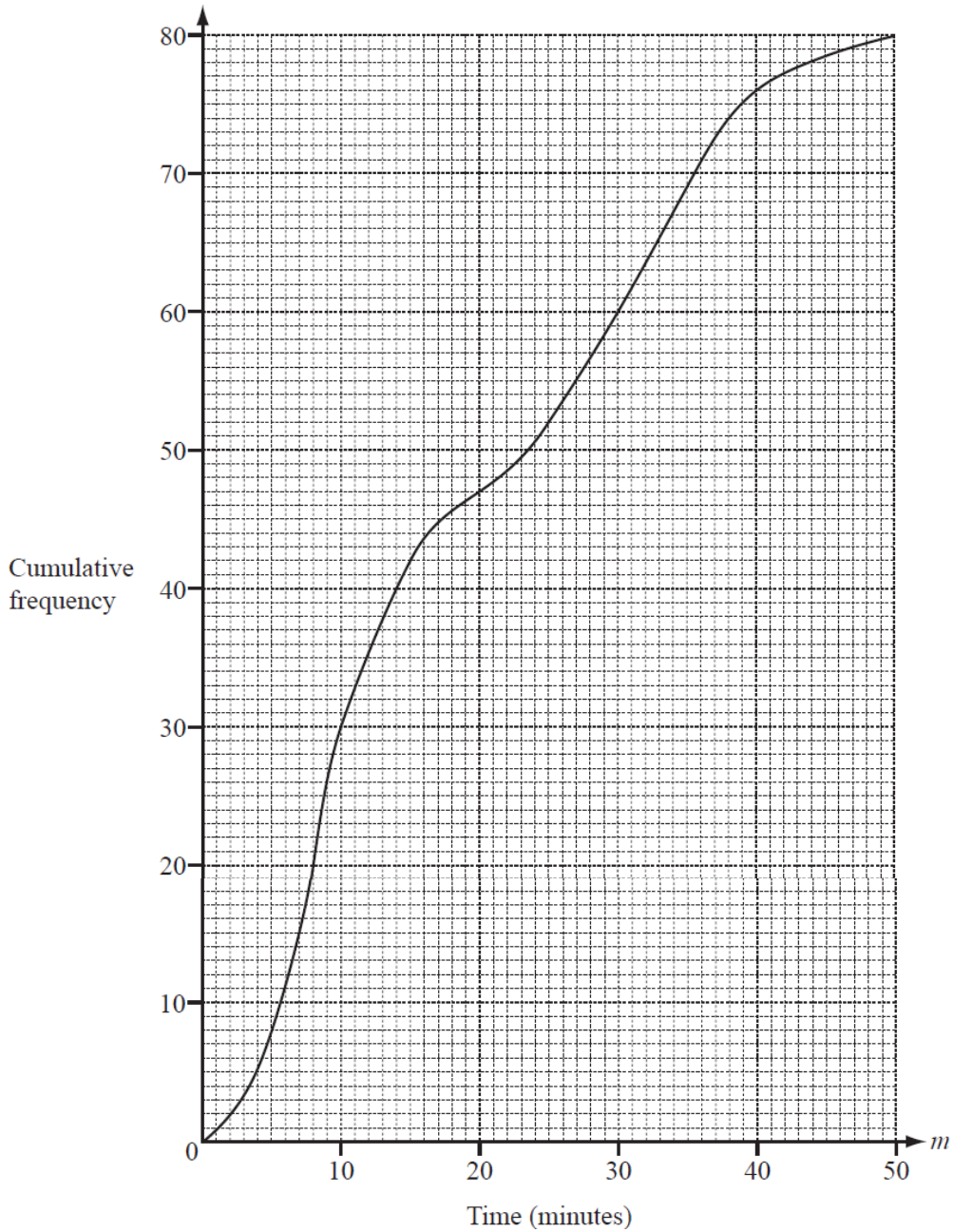
(a) Find

    (i) the median,   [1]

    (ii)   the lower quartile,   [1]

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

(b) One of the 80 people is chosen at random.

Find the probability that their journey to work took more than 35 minutes.
Give your answer as a fraction.   [2]

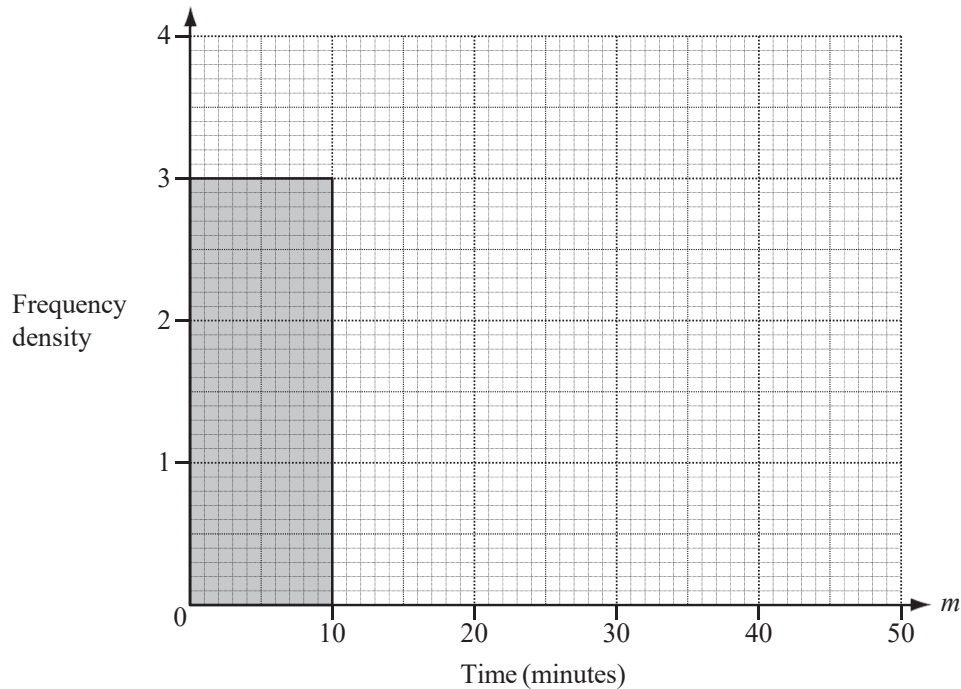(c) Use the cumulative frequency diagram to complete this frequency table.   [2]

Time (m minutes)	$0 < m \leqslant 10$	$10 < m \leqslant 15$	$15 < m \leqslant 30$	$30 < m \leqslant 40$	$40 < m \leqslant 50$
Frequency	30	12	18		

(d) Using mid-interval values, calculate an estimate of the mean journey time for the 80 people.   [3]
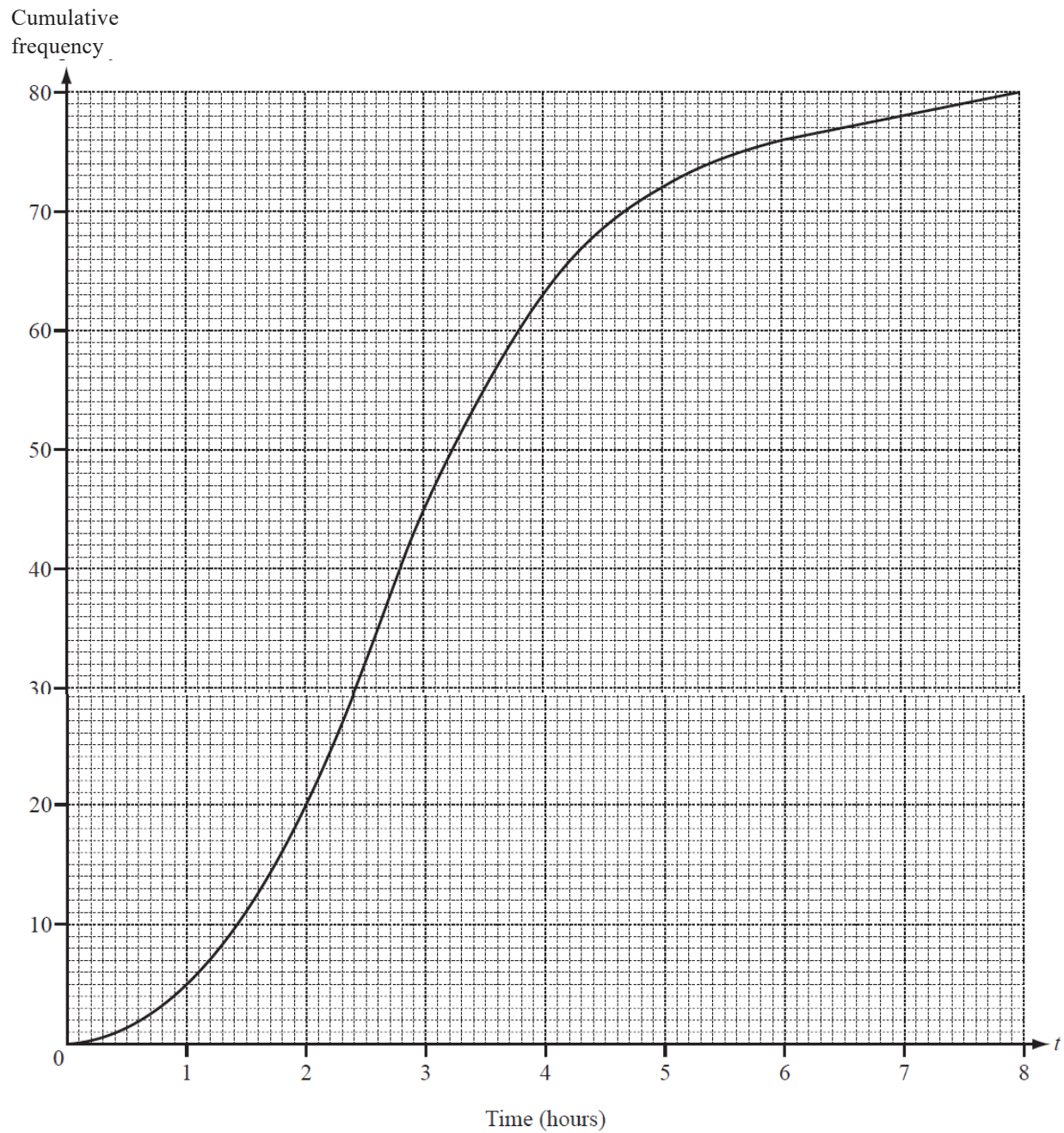
(e) Use the table in **part (c)** to complete the histogram to show the times taken by the 80 people.
One column has already been completed for you.   [5]

Time (minutes)

Felix asked 80 motorists how many hours their journey took that day.
He used the results to draw a cumulative frequency diagram.

(a) Find

   (i) the median,   [1]

   (ii) the upper quartile,   [1]

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

(b) Find the number of motorists whose journey took more than 5 hours but no more than 7 hours.

[1]

(c) The frequency table shows some of the information about the 80 journeys.

Time in hours (t)	$0 < t \leqslant 2$	$2 < t \leqslant 3$	$3 < t \leqslant 4$	$4 < t \leqslant 5$	$5 < t \leqslant 6$	$6 < t \leqslant 8$
Frequency	20	25	18			

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

(ii) Calculate an estimate of the mean number of hours the 80 journeys took.   [4]

(d) On the grid, draw a histogram to represent the information in your table in **part (c)**.

[5]
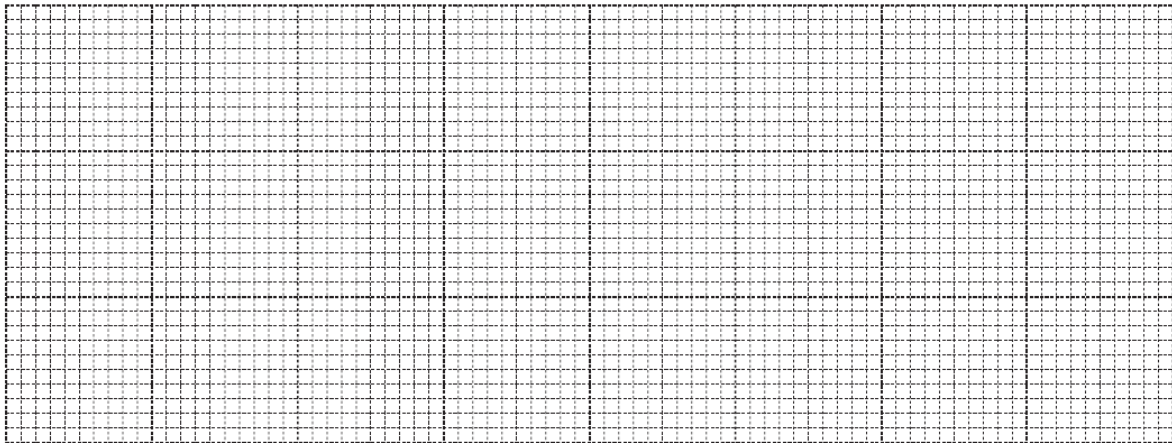
Mathematics mark	30	50	35	25	5	39	48	40	10	15
English mark	26	39	35	28	9	37	45	33	16	12

The table shows the test marks in Mathematics and English for 10 students.

(a) (i) On the grid, complete the scatter diagram to show the Mathematics and English marks for the 10 students. The first four points have been plotted for you.
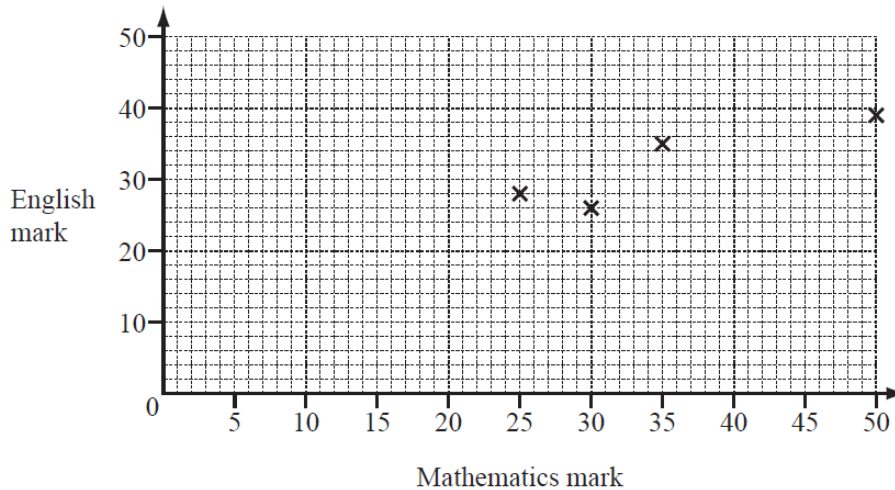
Mathematics mark [2]

(ii)   What type of correlation does your scatter diagram show? [1]

(iii)   Draw a line of best fit on the grid. [1]

(iv)   Ann missed the English test but scored 22 marks in the Mathematics test.
Use your line of best fit to estimate a possible English mark for Ann. [1]

(b) Show that the mean English mark for the 10 students is 28. [2]

(c) Two new students do the English test. They both score the **same** mark.
The mean English mark for the 12 students is 31.
Calculate the English mark for the new students. [3]

The table shows information about the heights of 120 girls in a swimming club.

Height (h metres)	Frequency
$1.3 < h \leqslant 1.4$	4
$1.4 < h \leqslant 1.5$	13
$1.5 < h \leqslant 1.6$	33
$1.6 < h \leqslant 1.7$	45
$1.7 < h \leqslant 1.8$	19
$1.8 < h \leqslant 1.9$	6

(a) (i) Write down the modal class. [1]

(ii) Calculate an estimate of the mean height. Show all of your working. [4]

(b) Girls from this swimming club are chosen at random to swim in a race.
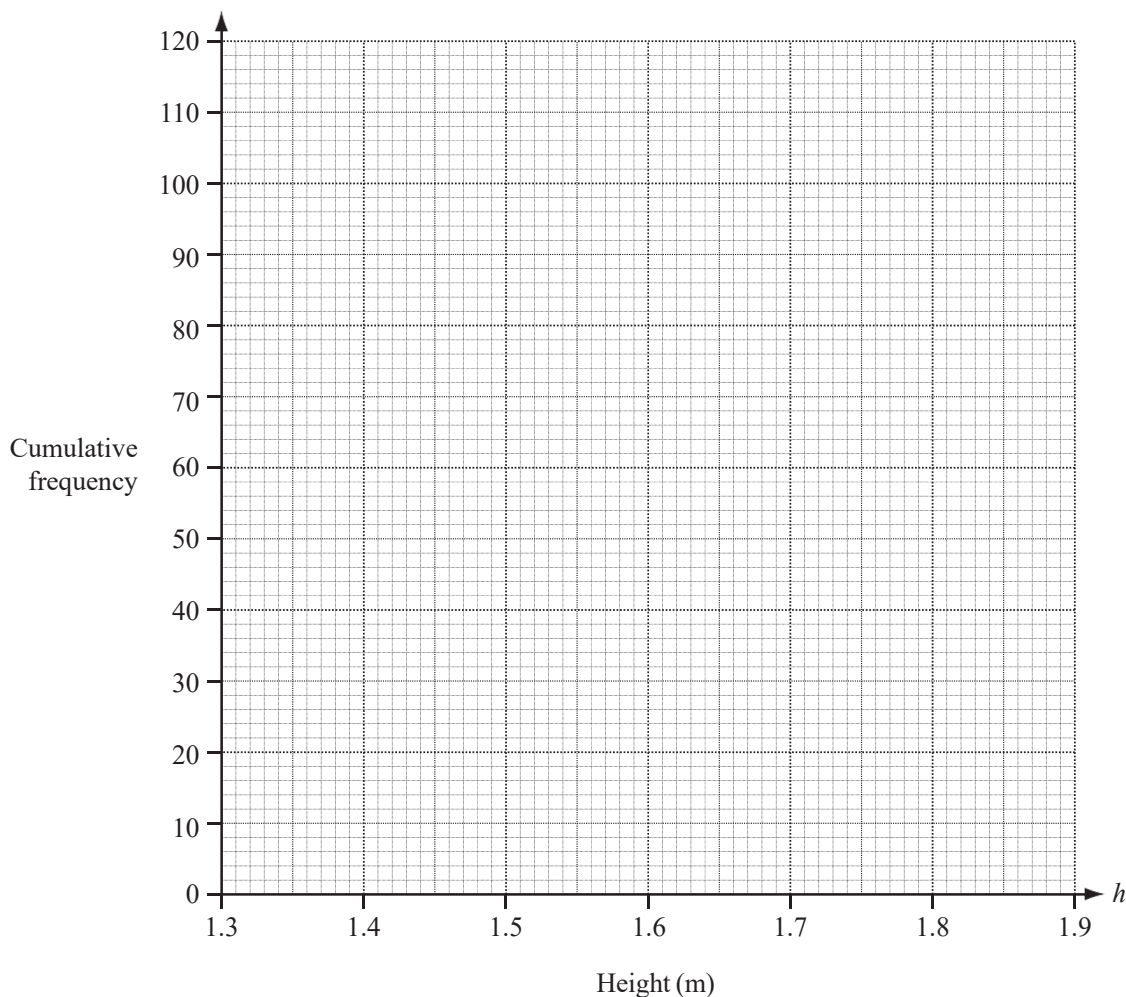Calculate the probability that

(i) the height of the first girl chosen is more than 1.8 metres, [1]

(ii) the heights of **both** the first and second girl chosen are 1.8 metres or less. [3]

(c) (i) Complete the cumulative frequency table for the heights. [1]

Height (h metres)	Cumulative frequency
$h \leq 1.3$	0
$h \leq 1.4$	4
$h \leq 1.5$	17
$h \leq 1.6$	50
$h \leq 1.7$	
$h \leq 1.8$	114
$h \leq 1.9$	

(ii) Draw the cumulative frequency graph on the grid. [3]

Height (m)

(d) Use your graph to find

(i) the median height, [1]

(ii) the 30th percentile. [1]

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The table below shows the marks scored by a group of students in a test.

Mark	11	12	13	14	15	16	17	18
Frequency	10	8	16	11	7	8	6	9

(a) Find the mean, median and mode. [6]

(b) The table below shows the time (t minutes) taken by the students to complete the test.

Time (t)	$0 < t \leqslant 10$	$10 < t \leqslant 20$	$20 < t \leqslant 30$	$30 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 60$
Frequency	2	19	16	14	15	9

   (i) Cara rearranges this information into a new table.

[2]

     Complete her table.

Time (t)	$0 < t \leqslant 20$	$20 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 60$
Frequency				9

   (ii) Cara wants to draw a histogram to show the information in **part (b)(i).**

     Complete the table below to show the interval widths and the frequency densities. [3]

	$0 < t \leqslant 20$	$20 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 60$
Interval width				10
Frequency density				0.9

(c) **Some** of the students were asked how much time they spent revising for the test.

10 students revised for 2.5 hours, 12 students revised for 3 hours and n students revised for 4 hours.

The mean time that **these** students spent revising was 3.1 hours.

Find n.

Show all your working. [4]

(a) For a set of six integers, the mode is 8, the median is 9 and the mean is 10.

The smallest integer is greater than 6 and the largest integer is 16.

Find the two possible sets of six integers. [5]

(b) One day Ahmed sells 160 oranges.
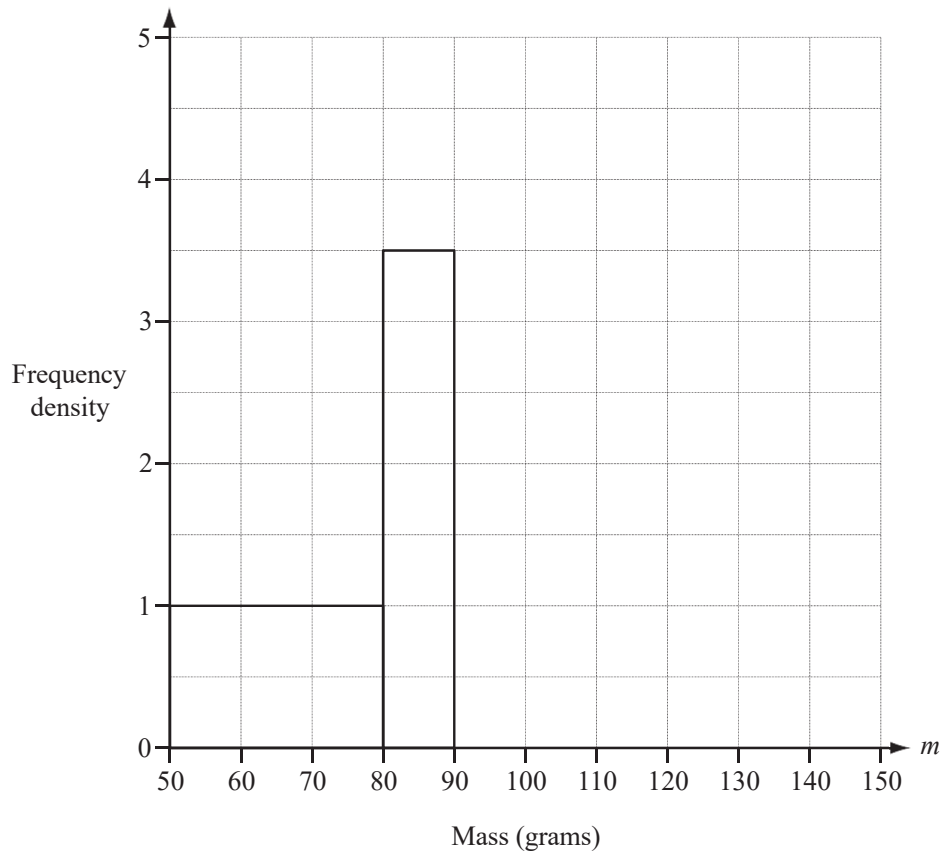He records the mass of each orange.
The results are shown in the table.

Mass (m grams)	$50 < m \leqslant 80$	$80 < m \leqslant 90$	$90 < m \leqslant 100$	$100 < m \leqslant 120$	$120 < m \leqslant 150$
Frequency	30	35	40	40	15

(i) Calculate an estimate of the mean mass of the 160 oranges. [4]

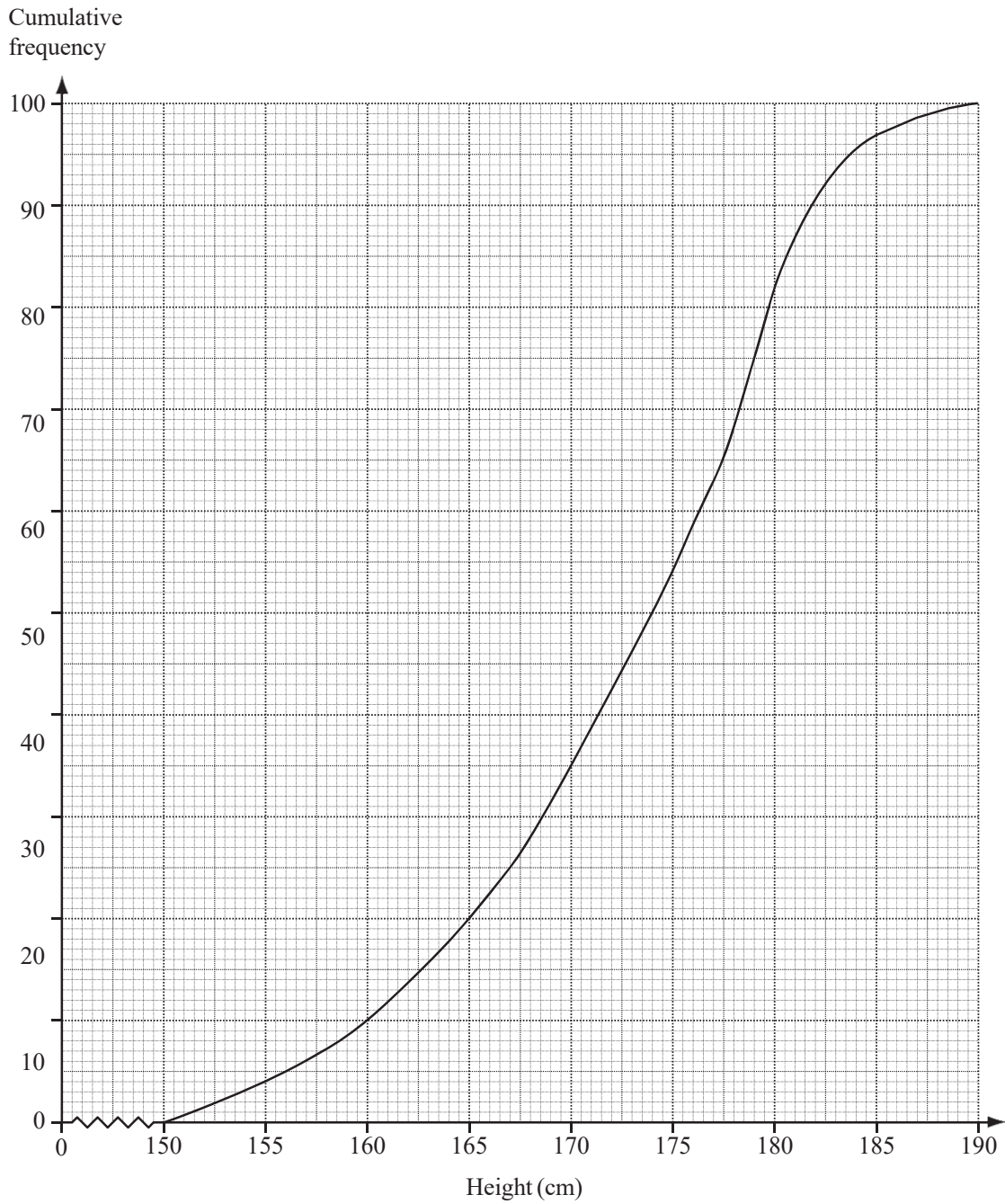(ii) On the grid, complete the histogram to show the information in the table.

Mass (grams)

[4]

The heights of 100 students are measured.

The results have been used to draw this cumulative frequency diagram.

(a) Find

    (i)   the median height,   [1]

    (ii)   the lower quartile,   [1]

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

    (iv)   the number of students with a height greater than 177 cm.   [2]

(b) The frequency table shows the information about the 100 students who were measured.

Height (h cm)	$150 < h \leqslant 160$	$160 < h \leqslant 170$	$170 < h \leqslant 180$	$180 < h \leqslant 190$
Frequency			47	18

    (i) Use the cumulative frequency diagram to complete the table above.   [1]

    (ii) Calculate an estimate of the mean height of the 100 students.   [4]