

Statistics

Difficulty: Hard

Question Paper 2

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Statistics
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 2

Time allowed: 105 minutes

Score: /91

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

200 people run 10 km.

The table shows some information about the times, t minutes, taken to run the 10 km.

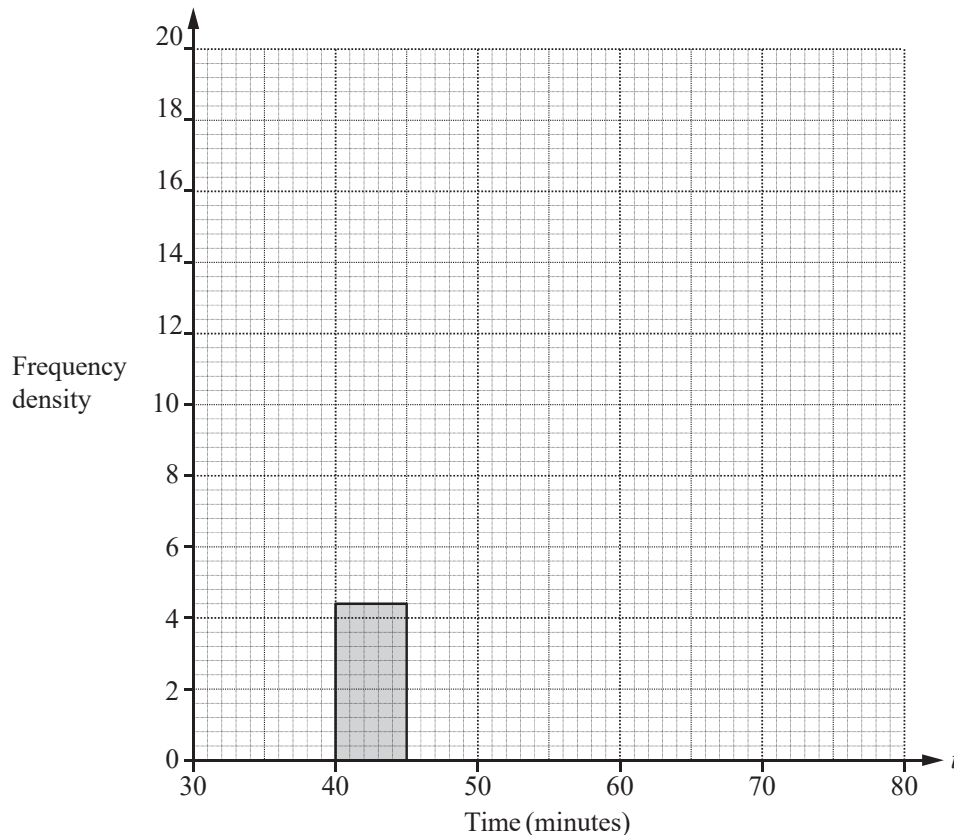
Time (t minutes)	$30 < t \leq 40$	$40 < t \leq 45$	$45 < t \leq 50$	$50 < t \leq 55$	$55 < t \leq 60$	$60 < t \leq 80$
Frequency	8	22	95	55	14	6

(a) Howard takes 40 minutes to run the 10 km.

Calculate his average speed in kilometres per hour. [2]

(b) Calculate an estimate of the mean time. [4]

(c) Complete the histogram to show the information in the table. [4]

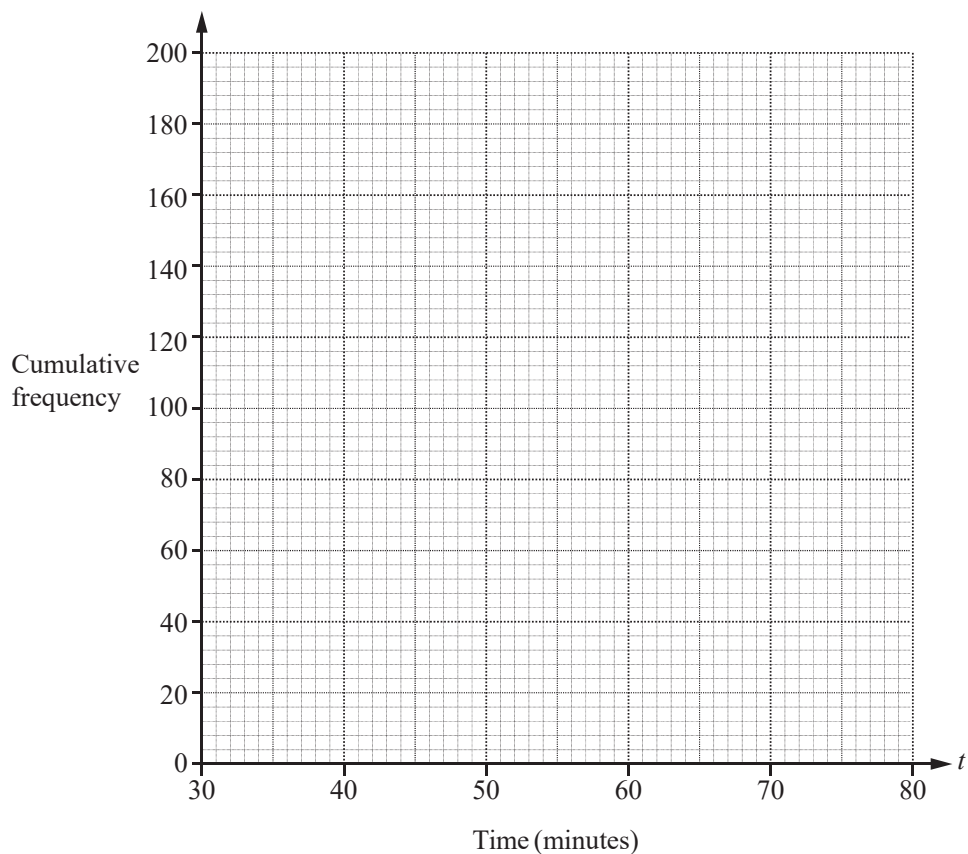


(d) (i) Use the frequency table opposite to complete the cumulative frequency table.

Time (t minutes)	$t \leq 40$	$t \leq 45$	$t \leq 50$	$t \leq 55$	$t \leq 60$	$t \leq 80$
Cumulative frequency	8	30			194	200

[1]

(ii) Draw a cumulative frequency diagram to show the information in the table above.



[3]

(iii) Use your diagram to find

(a) the median,

[1]

(b) the 90th percentile,

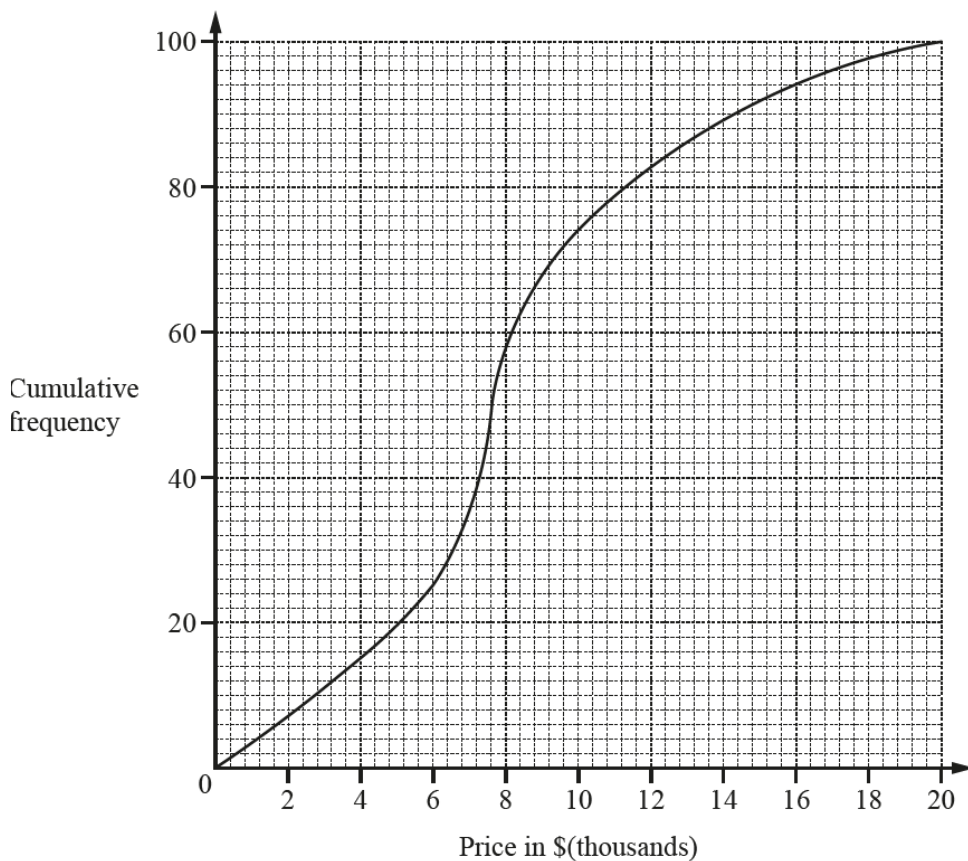
[1]

(c) the number of people who took more than 58 minutes to run the 10 km.

[2]

Question 2

(a) (i)



The cumulative frequency diagram shows information about the prices of 100 cars on Website A. Use the information to complete this table.

Lower quartile	Median	Upper quartile	Inter-quartile range
\$	\$7600	\$	\$

[2]

(ii) This table shows information about the prices of cars on Website B.

Lower quartile	Median	Upper quartile	Inter-quartile range
\$7600	\$10 800	\$13 600	\$6000

Here are two statements comparing the distributions of the prices of cars on Website A and Website B.

For each statement write True or False.

Give a reason for each answer, stating clearly which statistic you use to make your decision.

(a) The prices of cars on Website A are lower than the prices of cars on Website B.

..... because

..... [1]

(b) A greater percentage of cars have a price more than \$13600 on Website A compared to Website B.

..... because

..... [1]

(b) The table shows the prices of cars on Website B.

Price (\$ P)	Number of cars
$0 < P \leq 6\,000$	9
$6\,000 < P \leq 8\,000$	29
$8\,000 < P \leq 10\,000$	20
$10\,000 < P \leq 12\,000$	14
$12\,000 < P \leq 14\,000$	21
$14\,000 < P \leq 22\,000$	27

Calculate an estimate of the mean price of the 120 cars. [4]

(c) The price of a car is \$8760.

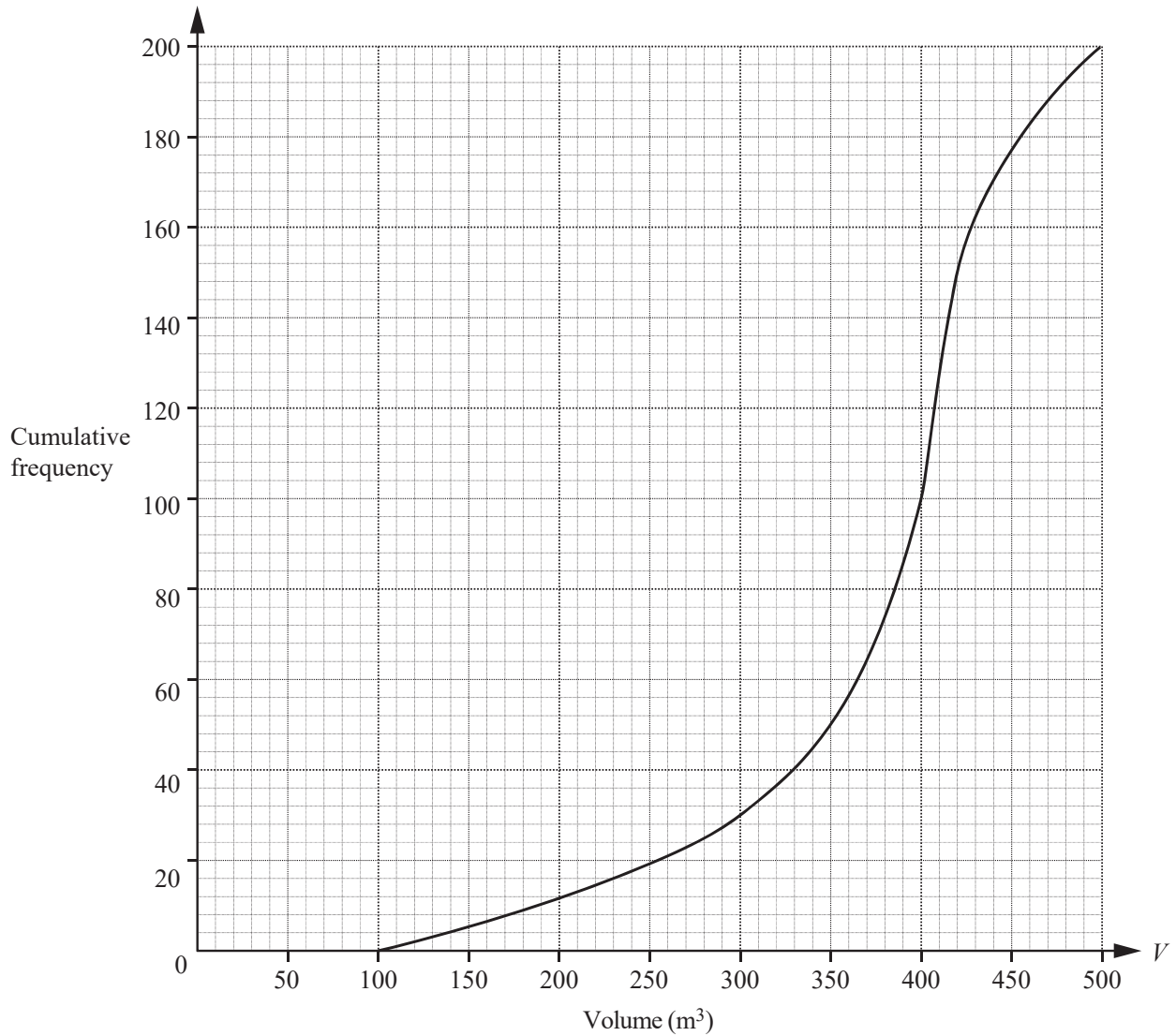
Bryan pays a deposit of 25% of this price and then 24 equal monthly payments.

After 24 months, he will have paid a total of \$9948.

Calculate the cost of one monthly payment. [3]

Question 3

- (a) 200 students estimate the volume, $V \text{ m}^3$, of a classroom.
The cumulative frequency diagram shows their results.



Find

- (i) the median, [1]
- (ii) the lower quartile, [1]
- (iii) the inter-quartile range, [1]
- (iv) the number of students who estimate that the volume is greater than 300m^3 . [2]

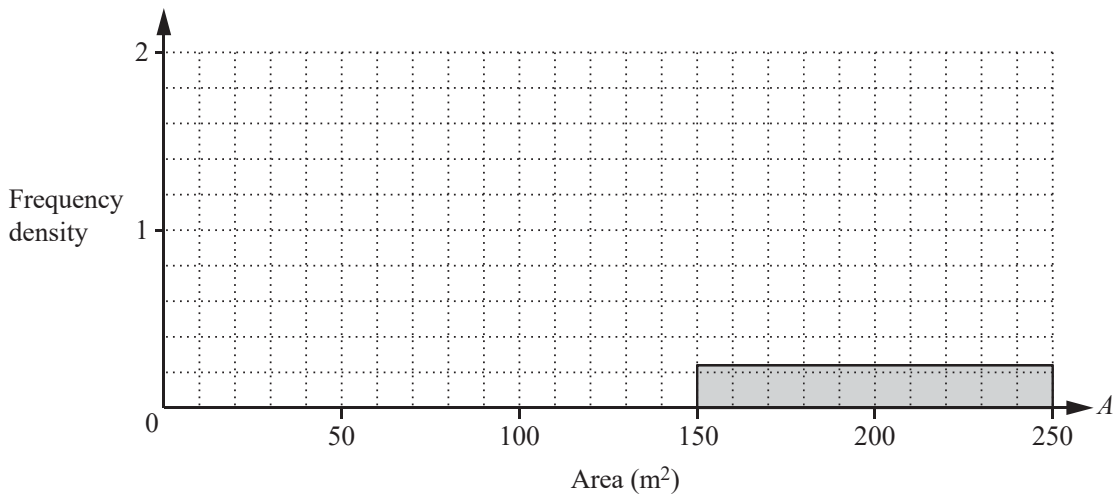
- (b) The 200 students also estimate the total area, $A \text{ m}^2$, of the windows in the classroom.
The results are shown in the table.

Area ($A \text{ m}^2$)	$20 < A \leq 60$	$60 < A \leq 100$	$100 < A \leq 150$	$150 < A \leq 250$
Frequency	32	64	80	24

- (i) Calculate an estimate of the mean.
Show all your working.

[4]

- (ii) Complete the histogram to show the information in the table.



[4]

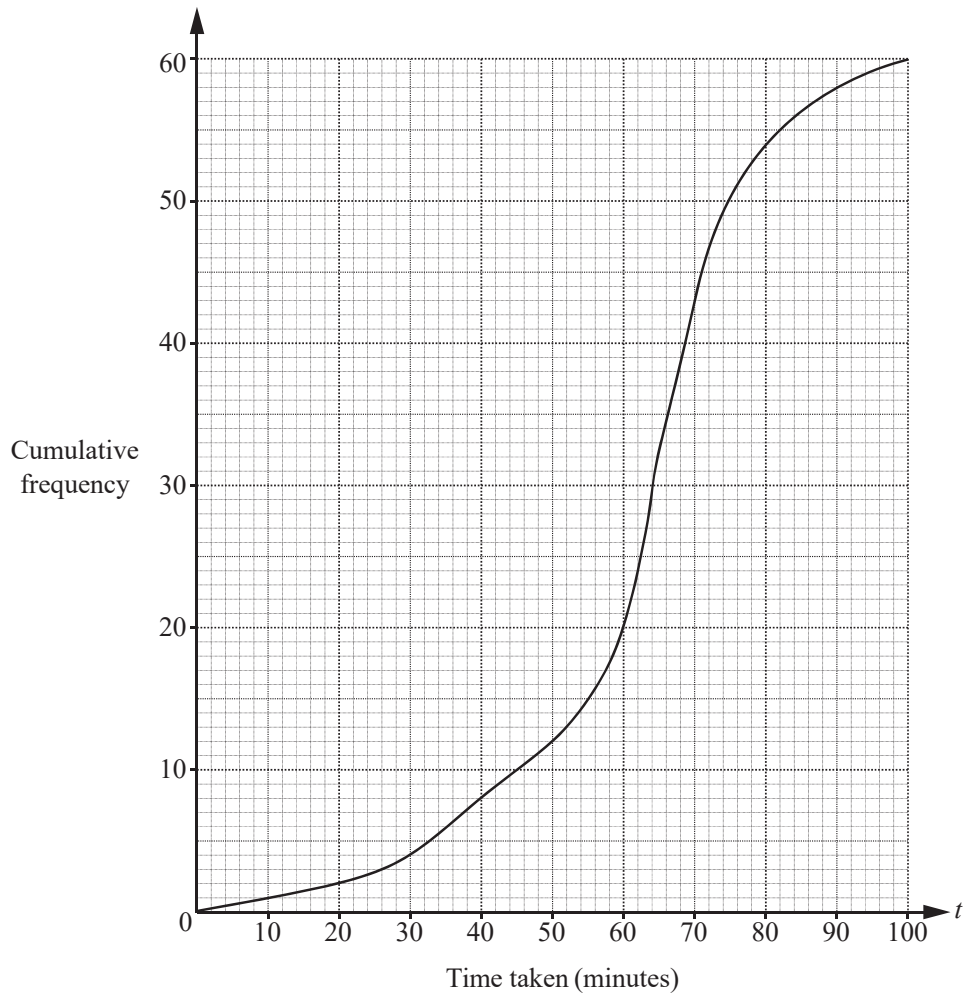
- (iii) Two of the 200 students are chosen at random.

Find the probability that they both estimate that the area is greater than 100 m^2 .

[2]

Question 4

The cumulative frequency diagram shows information about the time taken, t minutes, by 60 students to complete a test.



(a) Find

(i) the median, [1]

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

(iii) the 40th percentile, [2]

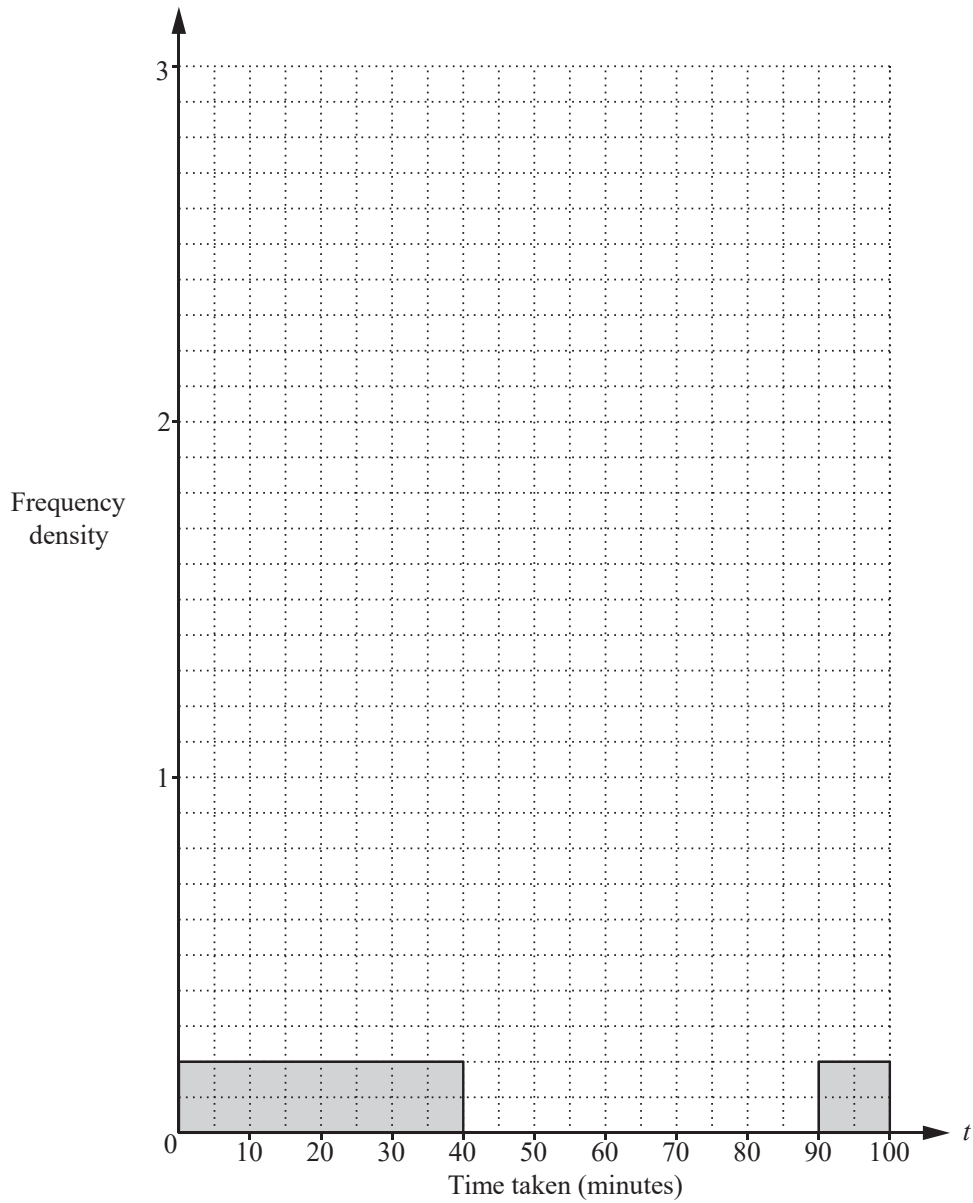
(iv) the number of students who took more than 80 minutes to complete the test. [2]

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

Time taken (t minutes)	$0 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 90$	$90 < t \leq 100$
Frequency	8				4	

[3]

(c) On the grid below, complete the histogram to show the information in the table in **part (b)**.



[4]

Question 5

The table shows the time, t minutes, that 400 people take to complete a test.

Time taken (t mins)	$0 < t \leq 10$	$10 < t \leq 24$	$24 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 70$
Frequency	10	90	135	85	70	10

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

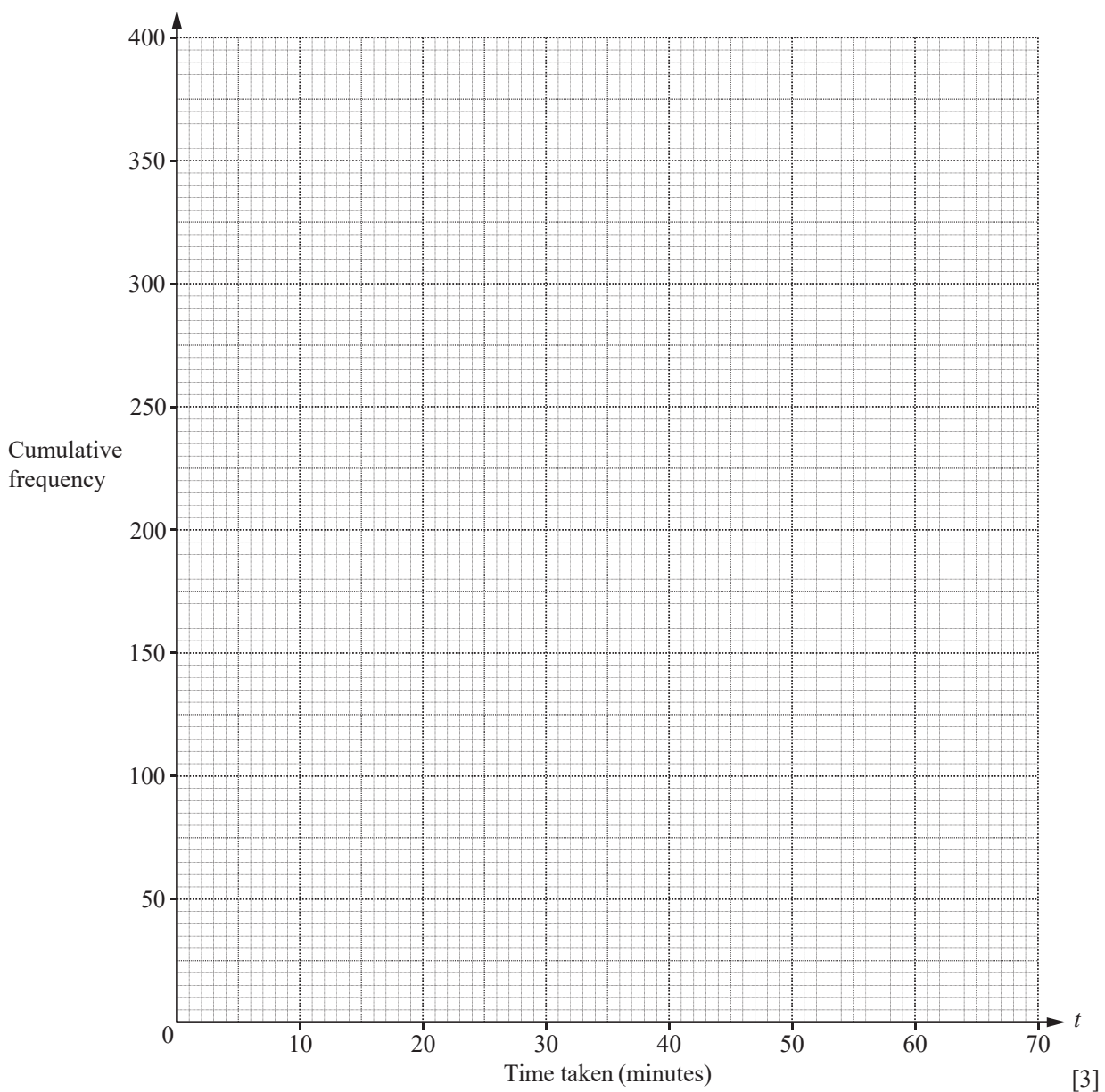
(ii) Calculate an estimate of the mean time taken to complete the test. [4]

(b) (i) Complete the table of cumulative frequencies.

Time taken (t mins)	$t \leq 10$	$t \leq 24$	$t \leq 30$	$t \leq 40$	$t \leq 60$	$t \leq 70$
Cumulative frequency	10	100				400

[2]

(ii) On the grid opposite, draw a cumulative frequency diagram to show this information.



- (c) Use your graph to estimate
- (i) the median time, [1]
 - (ii) the inter-quartile range, [2]
 - (iii) the 15th percentile, [2]
 - (iv) the number of people who took more than 50 minutes. [2]

Question 6

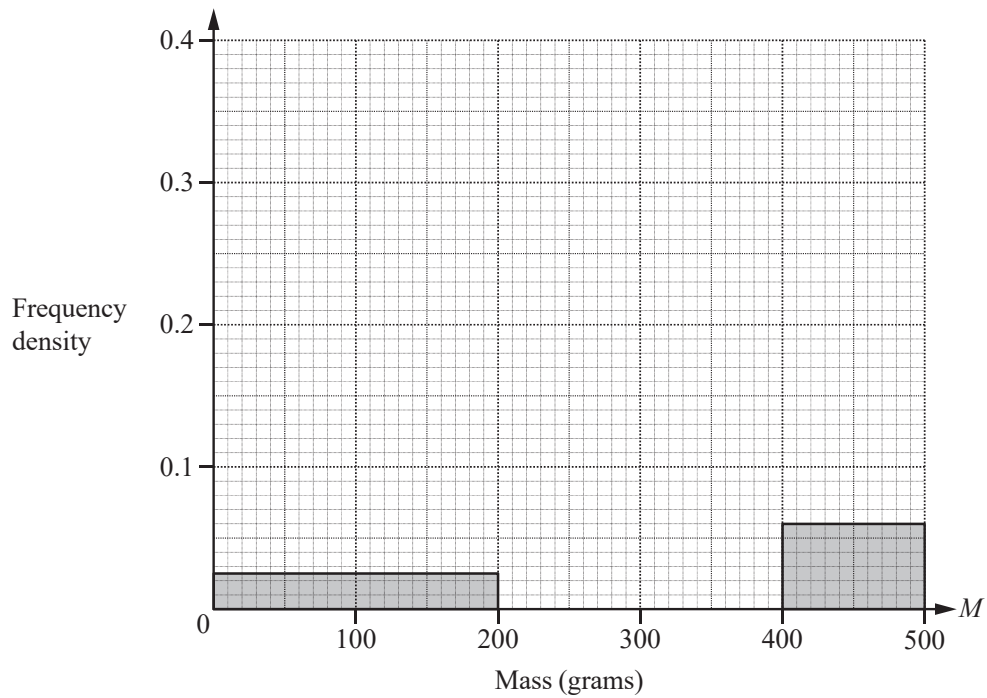
- (a) A group of 50 students estimated the mass, M grams, of sweets in a jar.
The results are shown in the table.

Mass (M grams)	Number of students
$0 < M \leq 200$	5
$200 < M \leq 300$	9
$300 < M \leq 350$	18
$350 < M \leq 400$	12
$400 < M \leq 500$	6

- (i) Calculate an estimate of the mean.

[4]

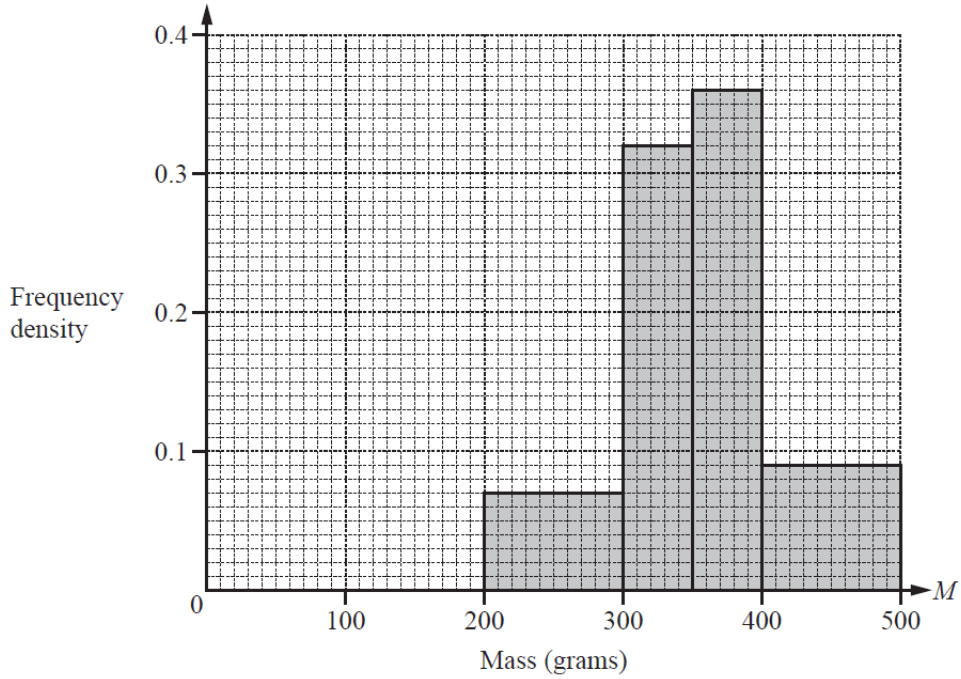
- (ii) Complete this histogram to show the information in the table.



[3]

- (b) A group of 50 adults also estimated the mass, M grams, of the sweets in the jar.
The histogram below shows information about their estimates.

Use the histograms to make two comparisons between the distributions of the estimates of the students and the adults.



[2]

Question 7

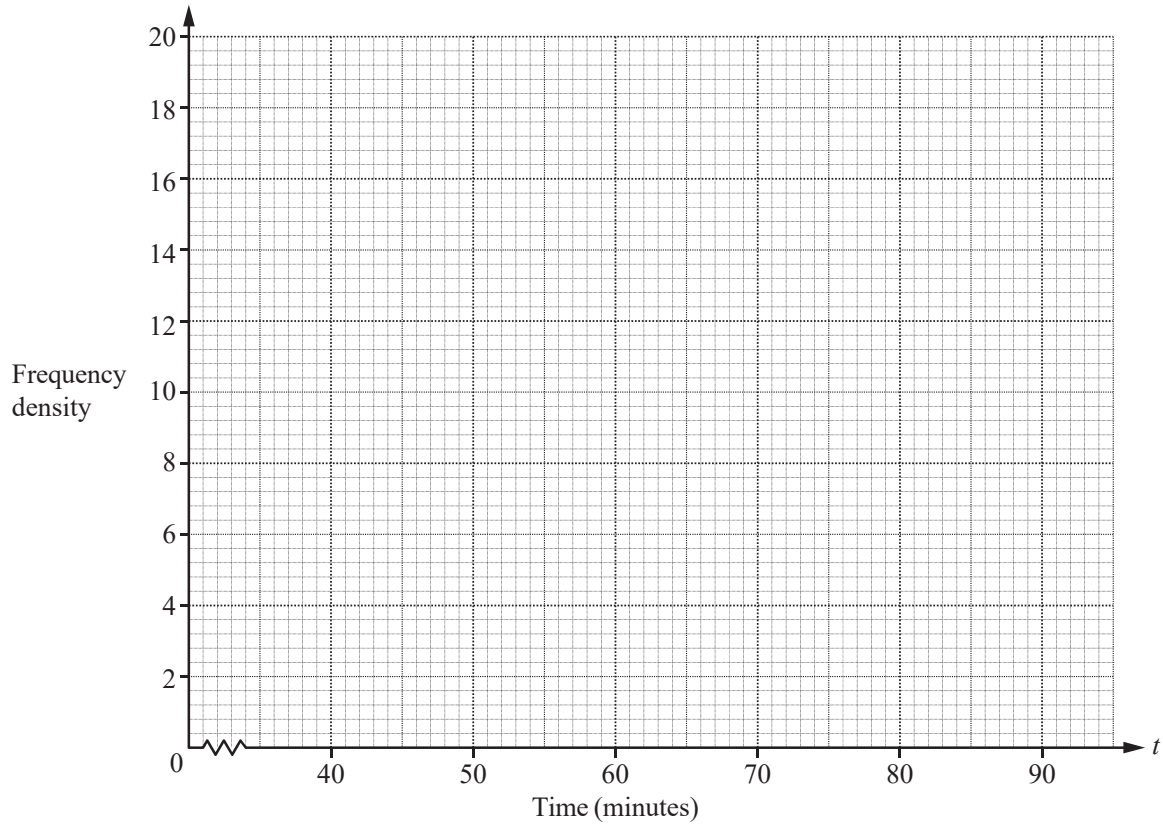
The table shows the times, t minutes, taken by 200 students to complete an IGCSE paper.

Time (t minutes)	$40 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 75$	$75 < t \leq 90$
Frequency	10	50	80	60

(a) By using mid-interval values, calculate an estimate of the mean time.

[3]

(b) On the grid, draw a histogram to show the information in the table.



[4]