IGCSE · Cambridge (CIE) · Maths

1 hour 22 questions

Exam Questions

Histograms

Frequency Density / Drawing Histograms / Interpreting Histograms

Medium (11 questions)	/36
Hard (6 questions)	/19
Very Hard (5 questions)	/22
Total Marks	**/77**

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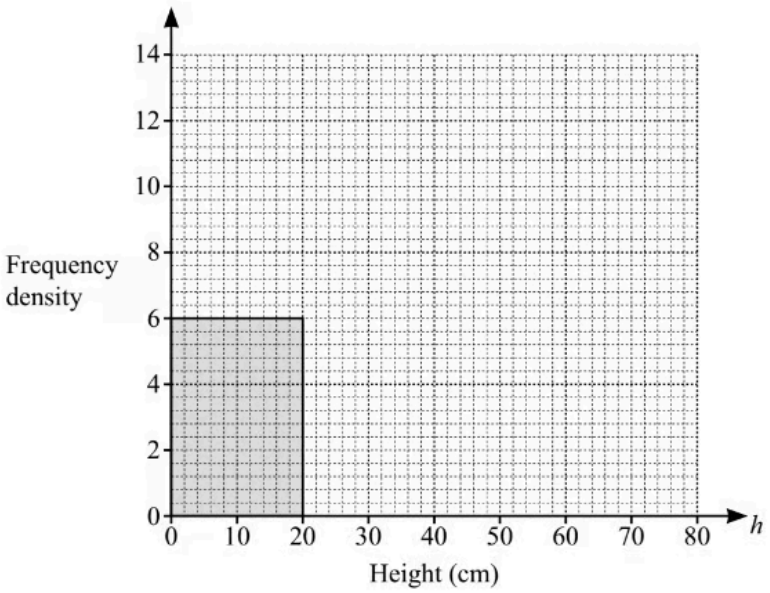
Medium Questions

1 The heights are also shown in the frequency table.

Height (h cm)	$0 < h \leqslant 20$	$20 < h \leqslant 30$	$30 < h \leqslant 40$	$40 < h \leqslant 80$
Frequency	120	80	124	76

Complete the histogram to show this information.



(3 marks)

2 The frequency table shows the times, t minutes, each of 100 children spent exercising in one week.

Time (t minutes)	$0 < t \leq 60$	$60 < t \leq 100$	$100 < t \leq 160$	$160 < t \leq 220$	$220 < t \leq 320$
Frequency	41	24	23	8	4

A histogram is drawn to show the information in the frequency table.
The height of the bar for the interval $60 < t \leq 100$ is 10.8 cm.

Calculate the height of the bar for the interval $160 < t \leq 220$.

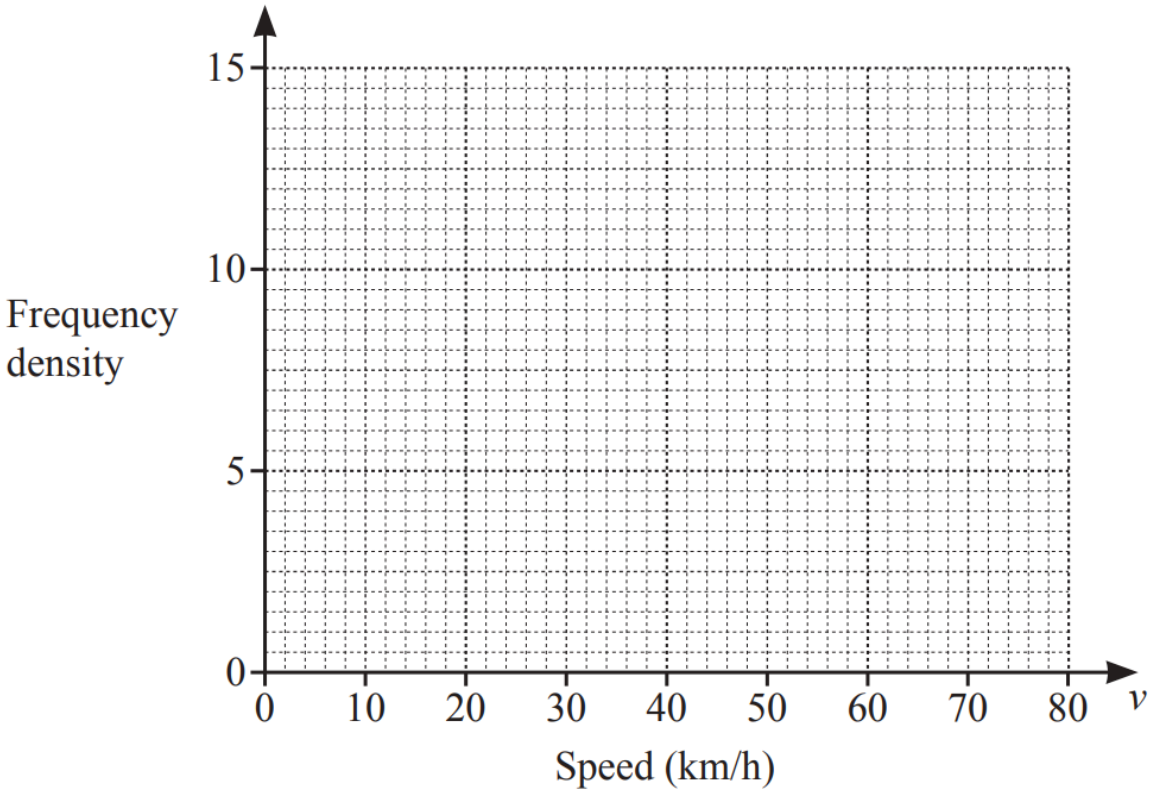
..... cm

(2 marks)

3 The speed, v km/h, of each of 200 cars passing a building is measured.
The frequency table shows the results.

Speed (v km/h)	$0 < v \leq 40$	$40 < v \leq 50$	$50 < v \leq 80$
Frequency	50	120	30

On the grid, draw a histogram to show the information in this table.

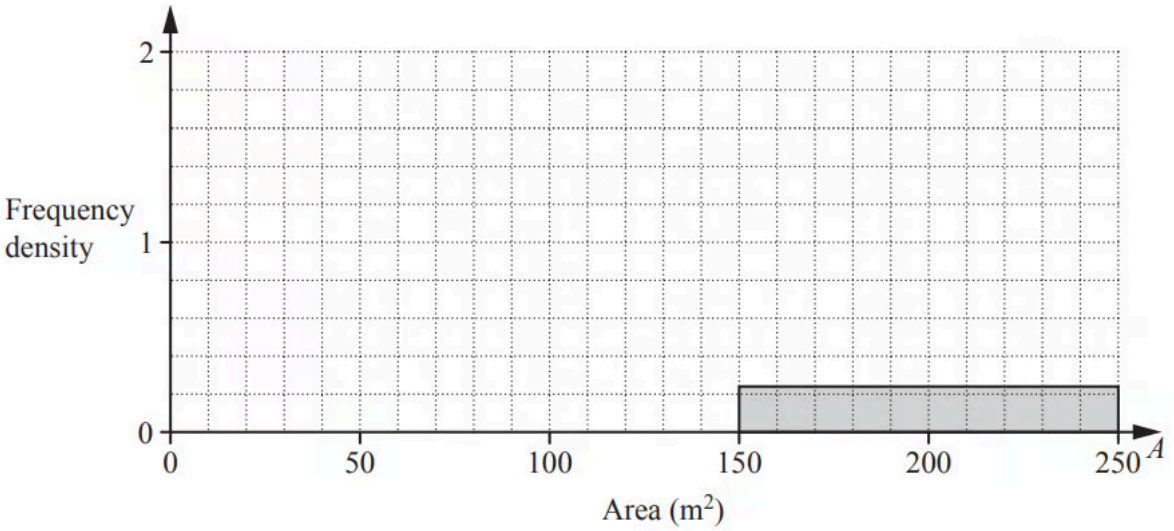


(3 marks)

4 200 students estimate the total area, A m^2, of the windows in a classroom.
The table shows their results.

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

Complete the histogram to show the information in the table.

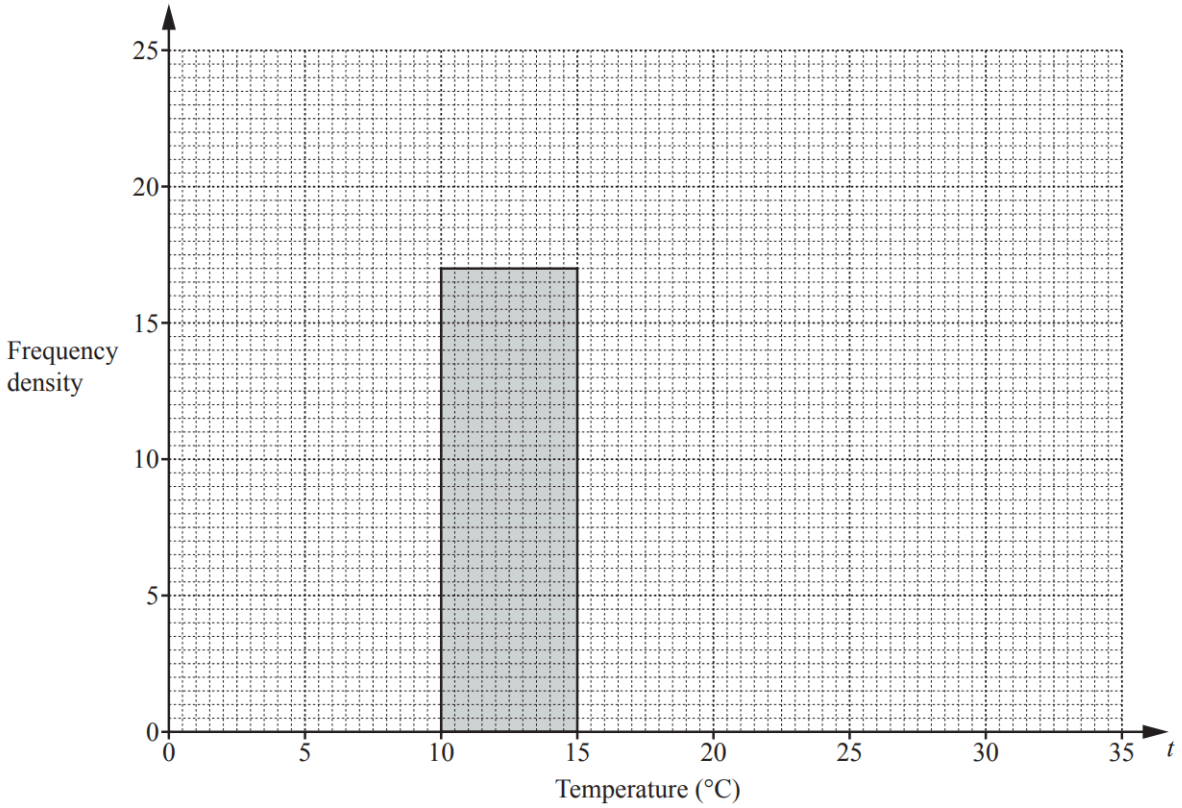


(4 marks)

5 During one year the midday temperatures, t °C, in Zedford were recorded.
The table shows the results.

Temperature (t °C)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 25$	$25 < t \leq 35$
Number of days	50	85	100	120	10

Complete the histogram to show the information in the table.

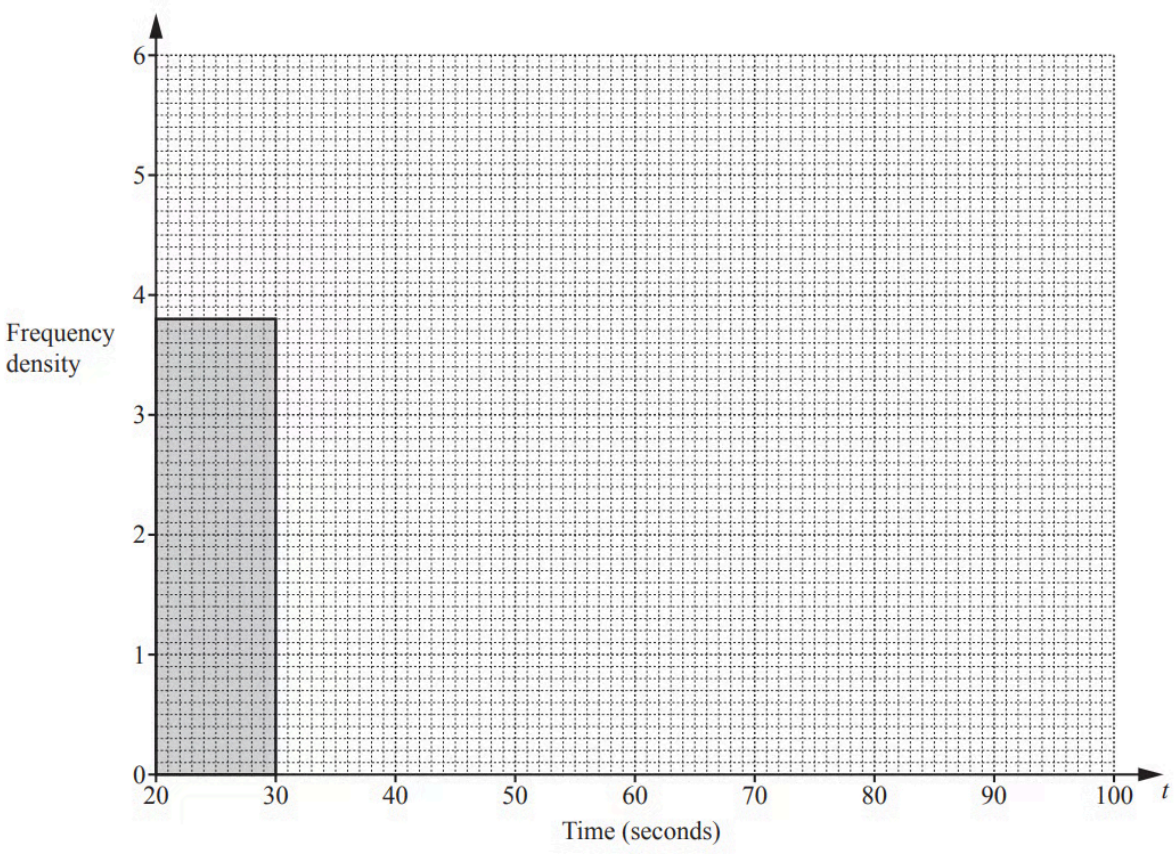


(4 marks)

6 The table shows the time, t seconds, taken by each of 120 boys to solve a puzzle.

Time (t seconds)	$20 < t \leq 30$	$30 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 100$
Frequency	38	27	21	16	18

On the grid, complete the histogram to show the information in the frequency table.



(4 marks)

7 Some students each record the mass, m kg, of their school bag.
Adil wants to draw a histogram to show this information. Complete the table below.

Mass (m kg)	$0 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 7$	$7 < m \leq 10$
Frequency	32			42
Height of bar on histogram (cm)	1.6	2	1.2	2.8

(2 marks)

8 A school nurse records the height, h cm, of each of 180 children. The table shows the information.

Height (h cm)	$60 < h \leq 70$	$70 < h \leq 90$	$90 < h \leq 100$	$100 < h \leq 110$	$110 < h \leq 115$	$115 < h \leq 125$
Frequency	8	26	35	67	28	16

In a histogram showing the information, the height of the bar for the interval $60 < h \leq 70$ is 0.4 cm.

Calculate the height of the bar for each of the following intervals.

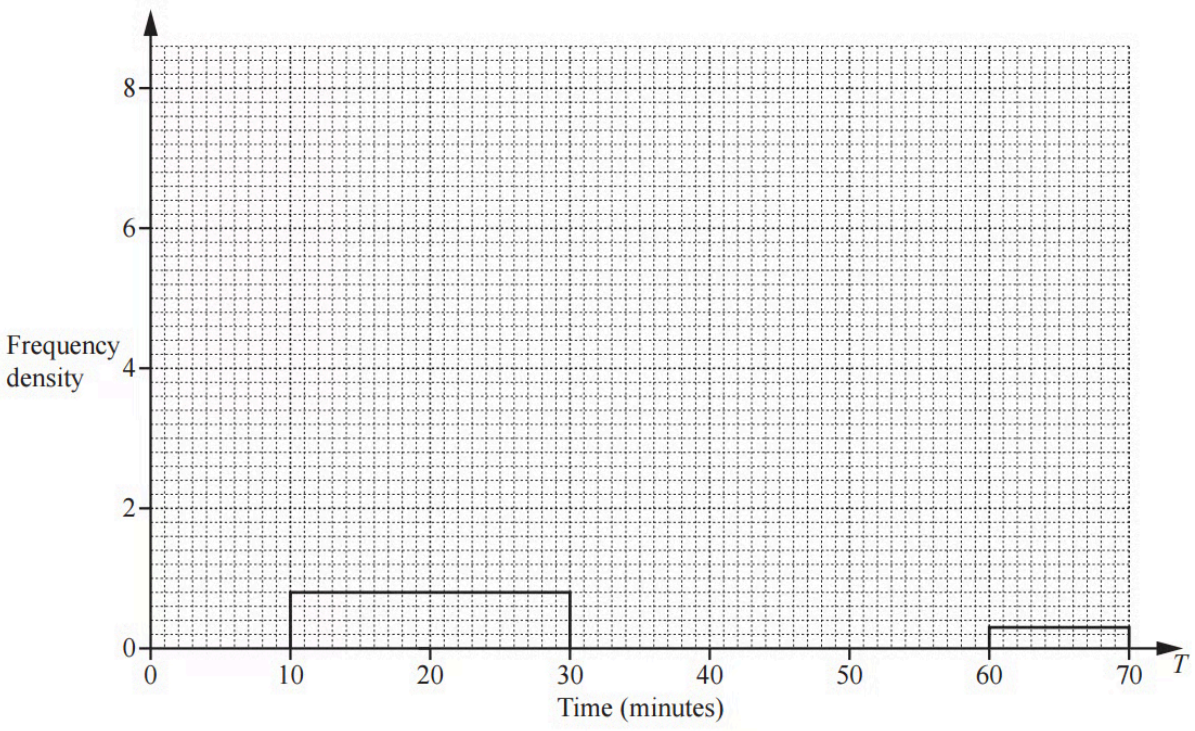
$115 < h \leq 125$ ..... cm
$110 < h \leq 115$ ..... cm
$70 < h \leq 90$ ..... cm

(3 marks)

9 (a) The table shows the amount of time, T minutes, 120 people each spend in a supermarket one Saturday.

Time (T minutes)	**Number of people**
$10 < T \leq 30$	16
$30 < T \leq 40$	18
$40 < T \leq 45$	22
$45 < T \leq 50$	40
$50 < T \leq 60$	21
$60 < T \leq 70$	3

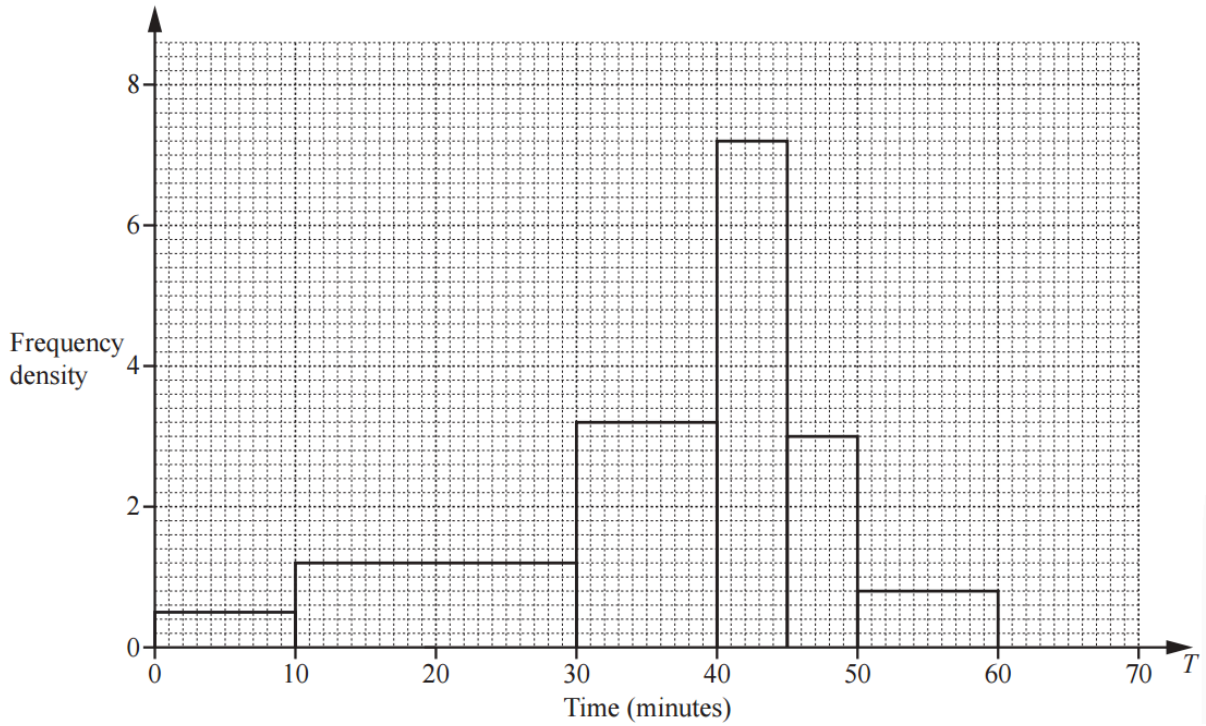
Complete this histogram to show the information in the table.



(4 marks)

(b) This histogram shows the amount of time, *T* minutes, 120 people each spend in the supermarket one

Wednesday.

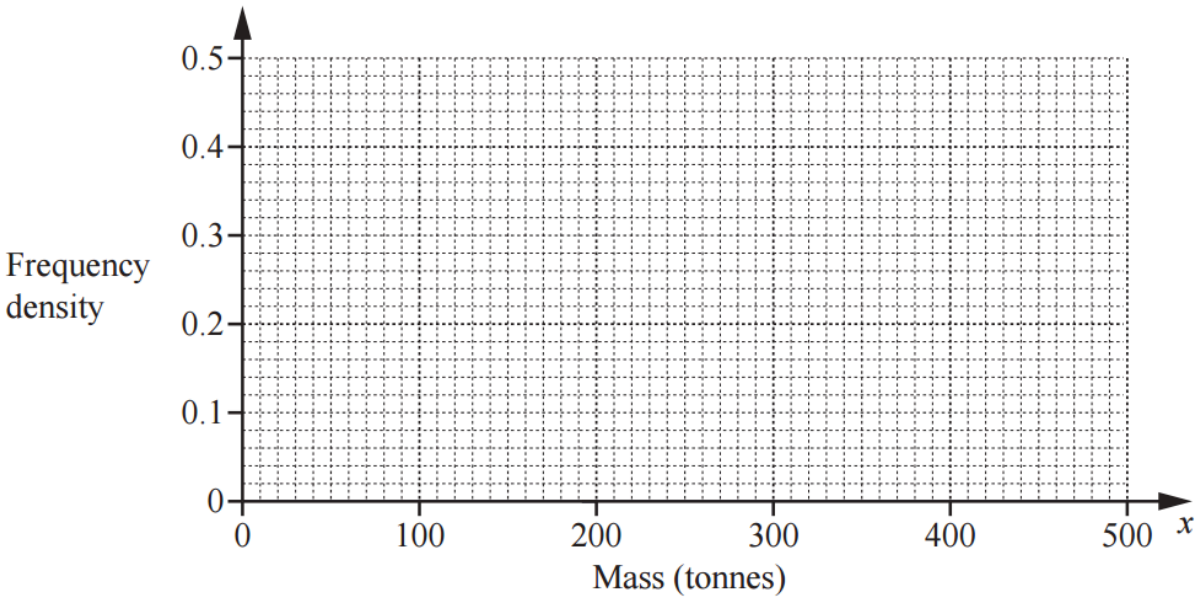


Make a comment comparing the distributions of the times for the two days.

(1 mark)

10 A factory recycles metal.
The mass, x tonnes, of metal is measured each week.
The table shows the results for 52 weeks.

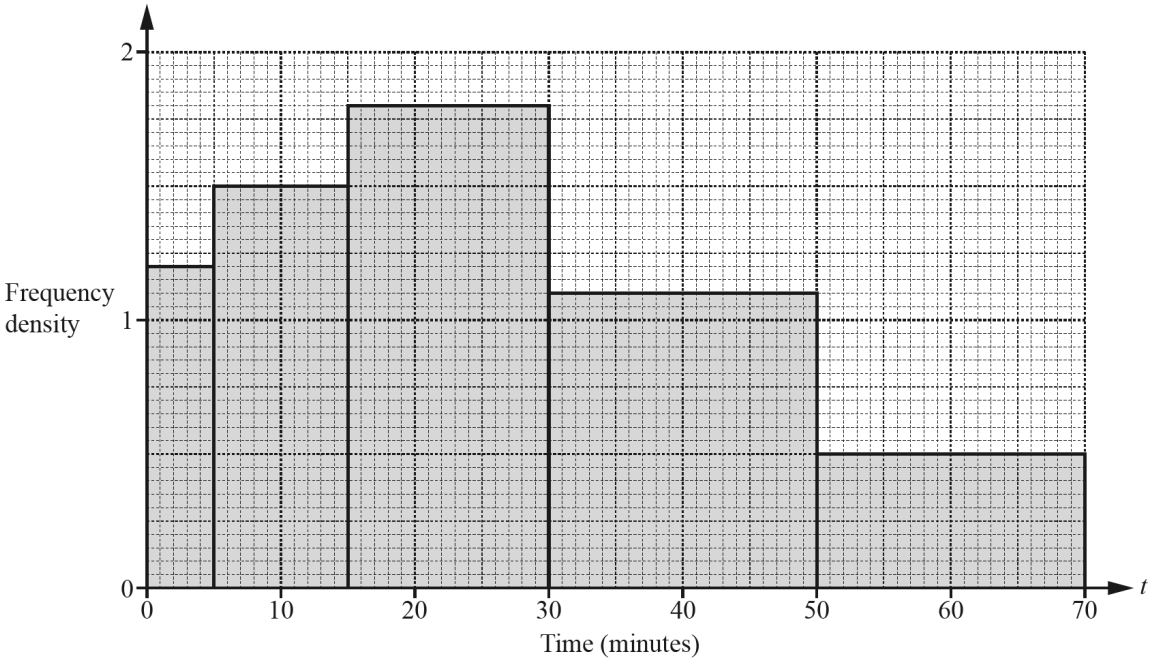
Mass (x tonnes)	$100 < x \leq 200$	$200 < x \leq 250$	$250 < x \leq 300$	$300 < x \leq 500$
Frequency	8	20	12	12



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

(4 marks)

11 The histogram shows information about the time, t minutes, spent in a shop by each of 80 people.



Complete the frequency table.

Time (t minutes)	$0 < t \leq 5$	$5 < t \leq 15$	$15 < t \leq 30$	$30 < t \leq 50$	$50 < t \leq 70$
Number of people	6		27		10

(2 marks)

Hard Questions

1 The height, h cm, of each of 120 plants is measured. The frequency table shows this information.

Height, h cm	$0 < h \leq 10$	$10 < h \leq 20$	$20 < h \leq 30$	$30 < h \leq 50$
Frequency	2	18	62	38

A histogram is drawn to show the information in the frequency table.
The height of the bar representing the interval $10 < h \leq 20$ is 7.2 cm.

Calculate the height of the bar representing the interval $30 < h \leq 50$.

..... cm

(2 marks)

2 The table shows information about the times, t seconds, taken by each of 100 students to solve a puzzle.

Time (t seconds)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 40$	$40 < t \leq 75$
Frequency	9	18	22	30	21

Emmanuel draws a histogram to show this information.
The table shows the heights, in cm, of some of the bars for this histogram.
Complete the table.

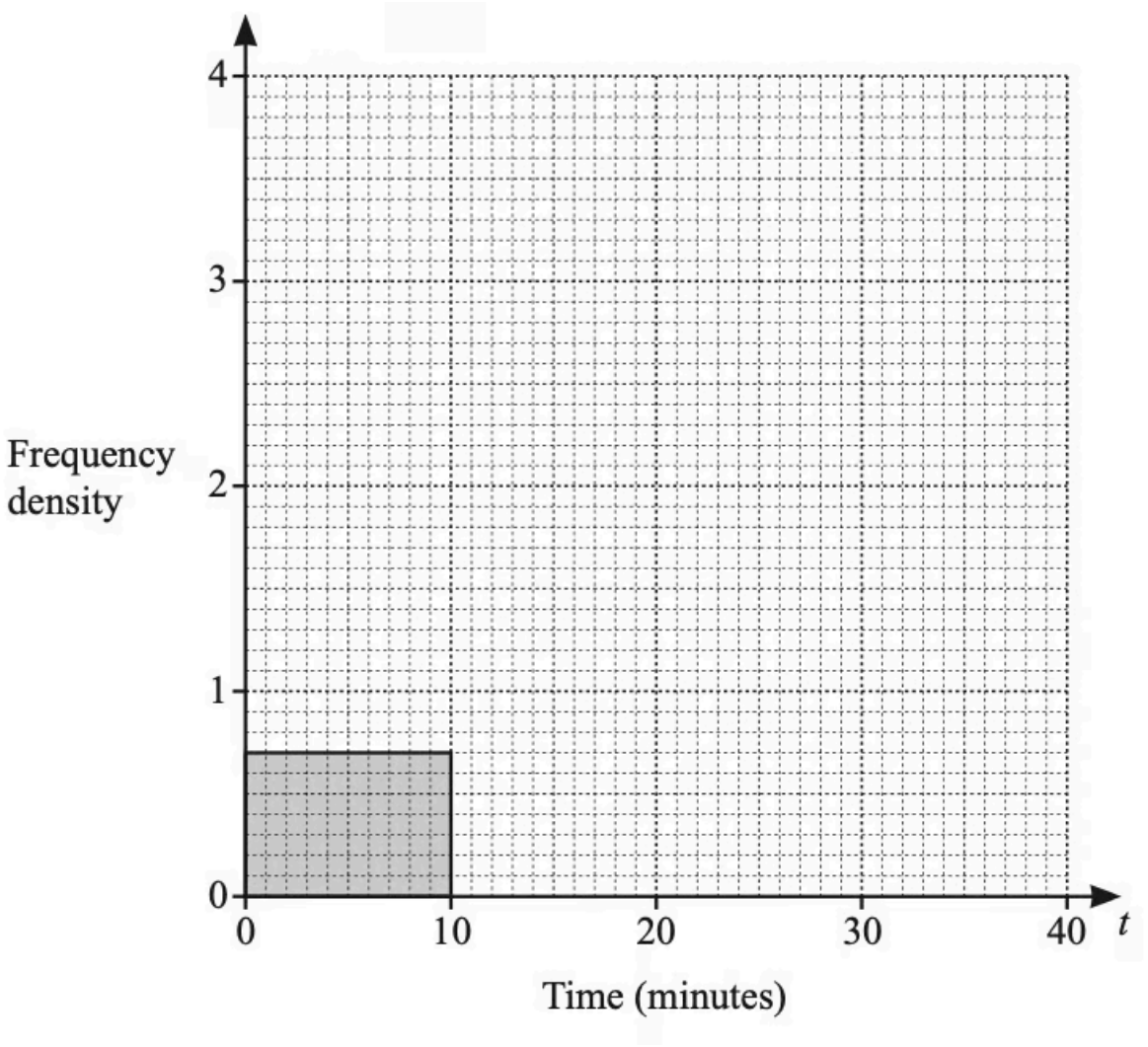
Time (t seconds)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 40$	$40 < t \leq 75$
Height of bar (cm)	3.6	14.4	17.6		

(3 marks)

3 The time, t minutes, it takes each of 50 students to travel to school is recorded.
The table shows the results.

Time (t minutes)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 40$
Frequency	7	19	16	8

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



(3 marks)

4 The table shows the number of people in different age groups at a cinema.

Age (y years)	$15 < y \leq 25$	$25 < y \leq 30$	$30 < y \leq 50$	$50 < y \leq 80$
Number of people	35	32	44	12

Dexter draws a histogram to show this information.
The height of the bar he draws for the group $15 < y \leq 25$ is 7 cm.

Calculate the height of each of the remaining bars.

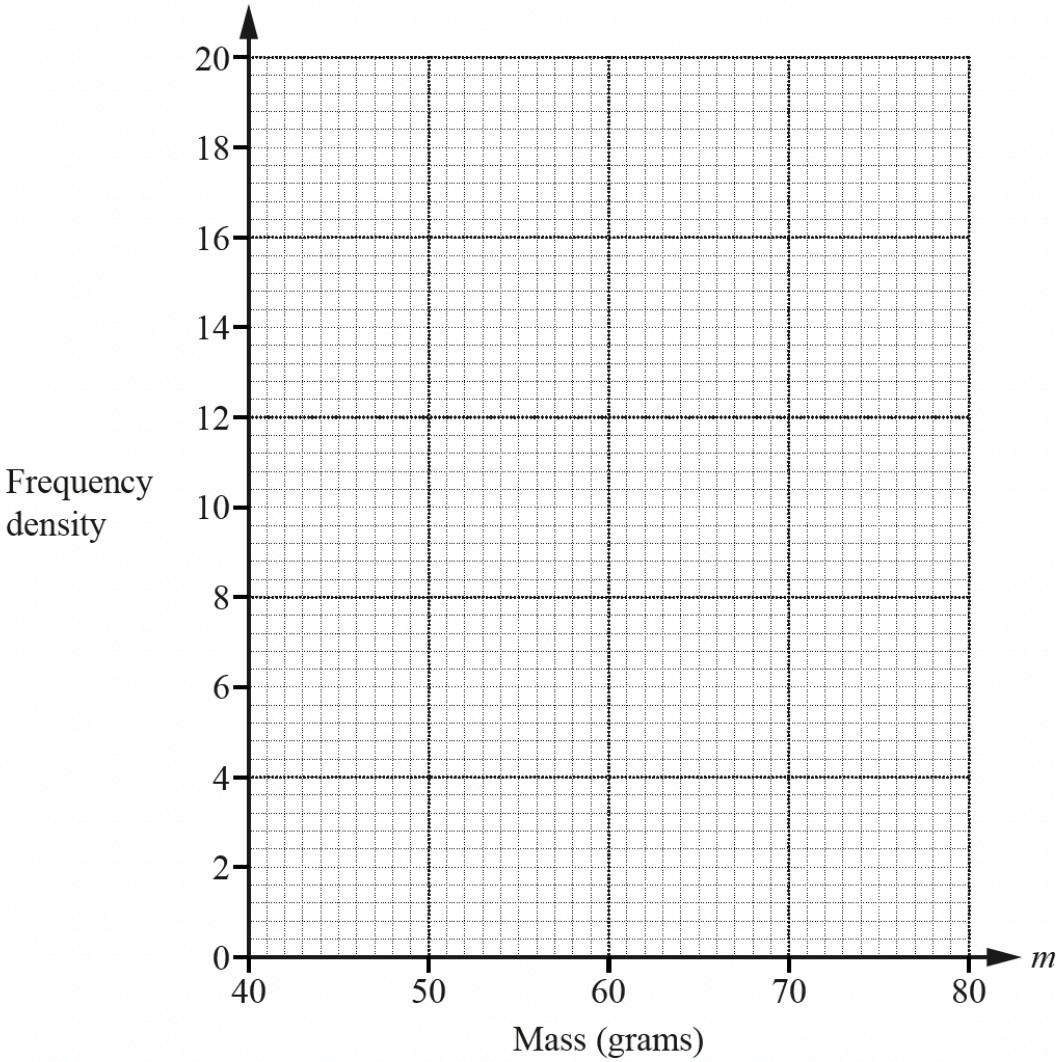
$25 < y \leq 30$ ..... cm
$30 < y \leq 50$ ..... cm
$50 < y \leq 80$ ..... cm

(3 marks)

5 Three sizes of eggs are sold in a shop. The table shows the number of eggs of each size sold in one day.

Size	Small	Medium	Large
Mass (m grams)	$46 < m \leq 52$	$52 < m \leq 62$	$62 < m \leq 80$
Number of eggs sold	78	180	162

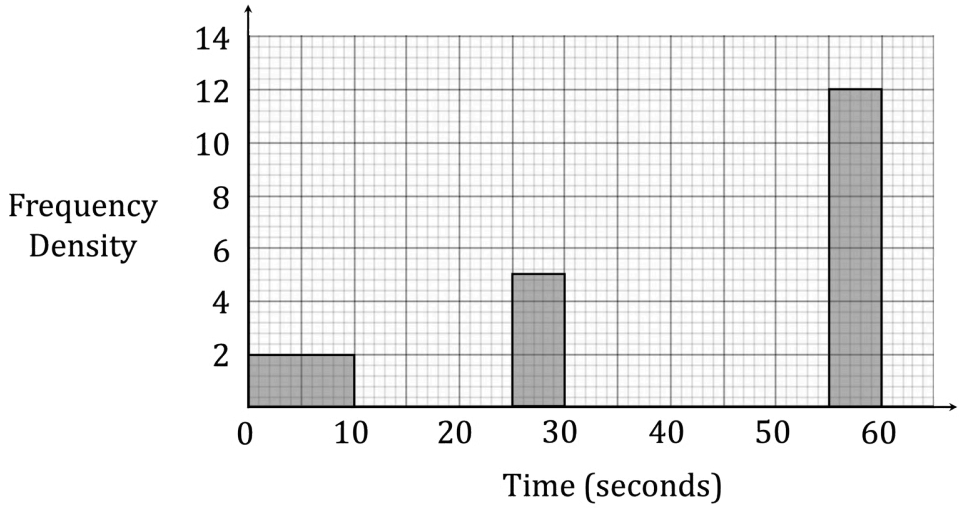
On the grid, draw a histogram to show the information in the table.



(4 marks)

6 (a) The table and histogram shows information about the heights of plants in a garden.

Heights (cm)	Frequency
$0 < h \leq 10$	
$10 < h \leq 25$	135
$25 < h \leq 30$	25
$30 < h \leq 40$	70
$40 < h \leq 55$	45
$55 < h \leq 60$	



Complete the histogram.

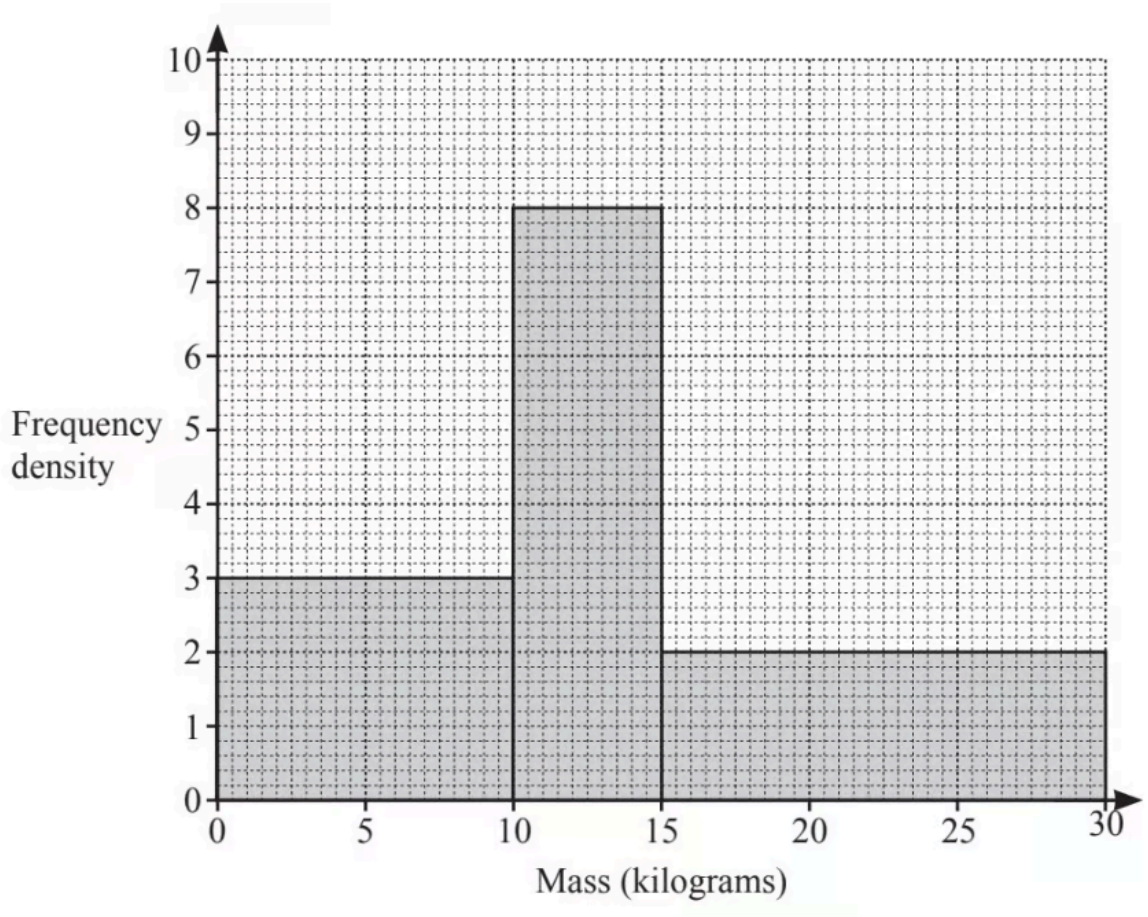
(2 marks)

(b) Complete the table using the histogram.

(2 marks)

Very Hard Questions

1

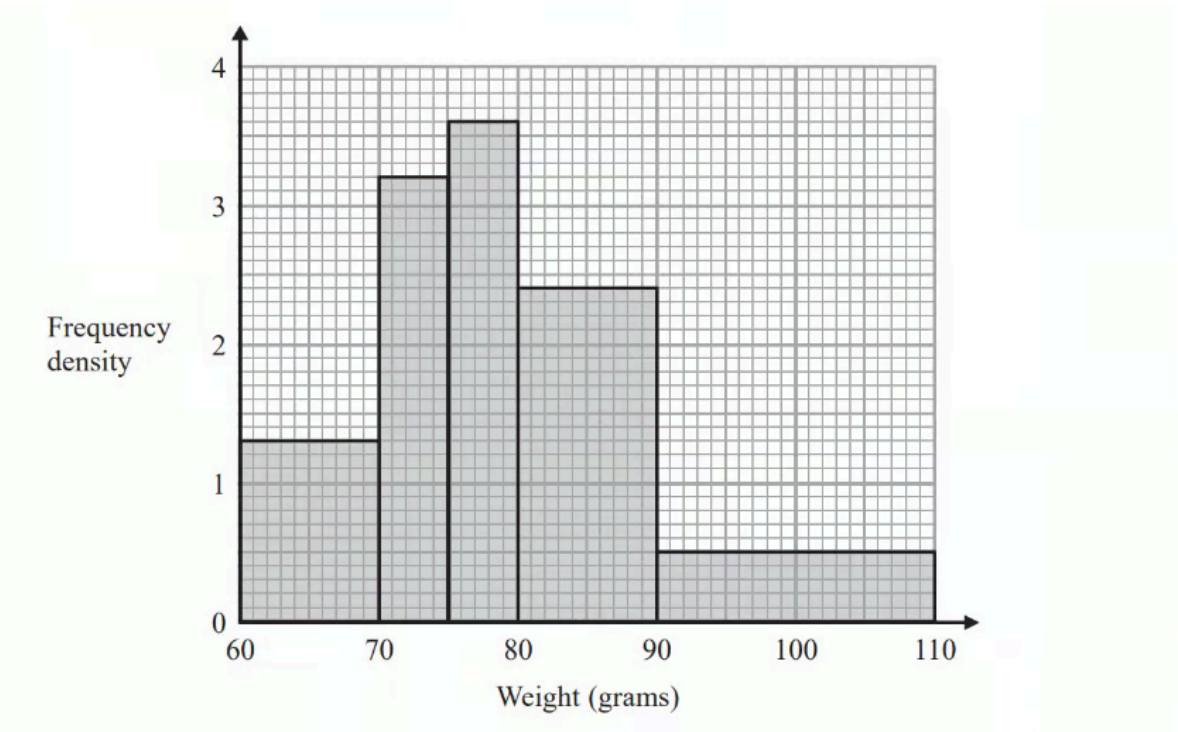


Calculate an estimate of the mean.

..... kg

(6 marks)

2 The histogram shows information about the weights, in grams, of some plums.



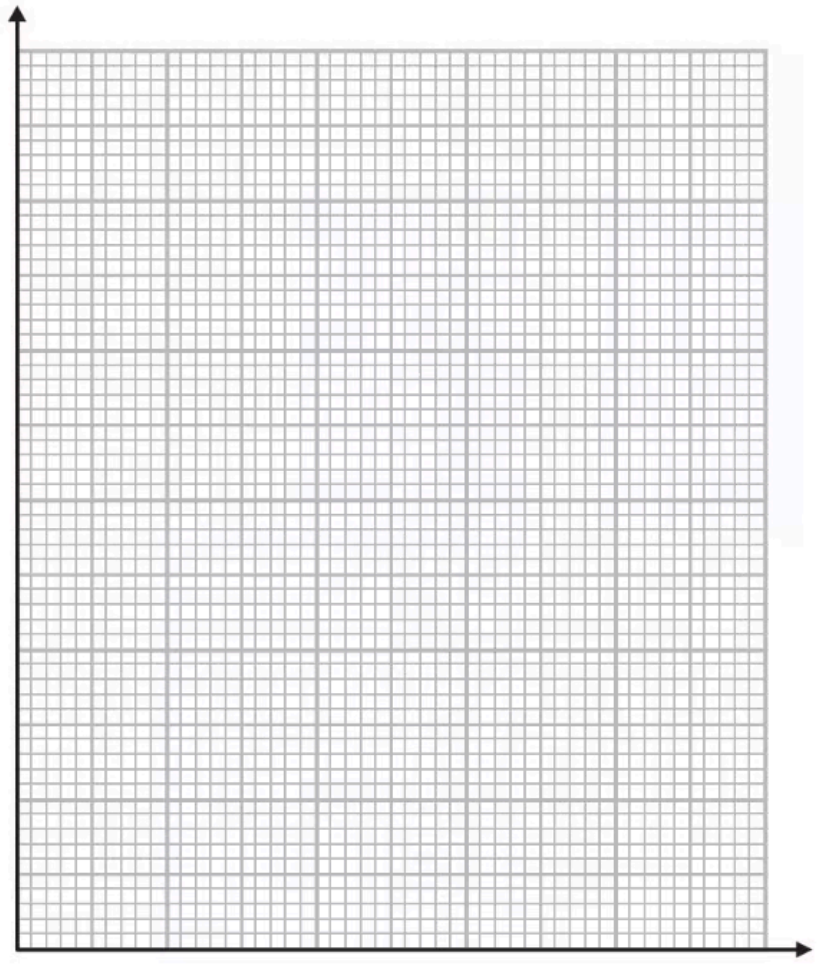
Work out an estimate for the proportion of these plums with a weight of less than 100 grams.

(3 marks)

3 (a) The table gives information about the heights of 150 students.

Height(h cm)	Frequency
$140 < h \leqslant 150$	15
$150 < h \leqslant 155$	30
$155 < h \leqslant 160$	51
$160 < h \leqslant 165$	36
$165 < h \leqslant 180$	18

On the grid, draw a histogram for this information.

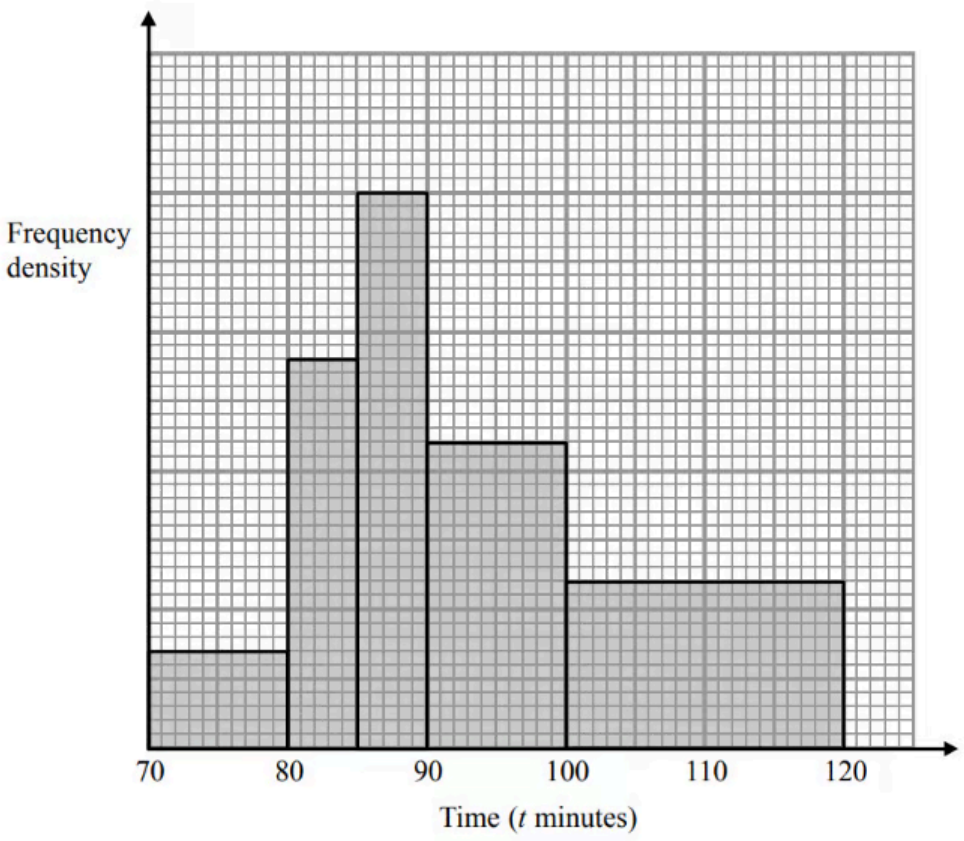


(3 marks)

(b) Work out an estimate for the fraction of the students who have a height between 150 cm and 170 cm.

(2 marks)

4 The histogram shows information about the time taken by cyclists to finish a cycle race.



7 cyclists took 80 minutes or less to finish the race.

i) Work out an estimate for the number of cyclists who took more than 105 minutes to finish the race.

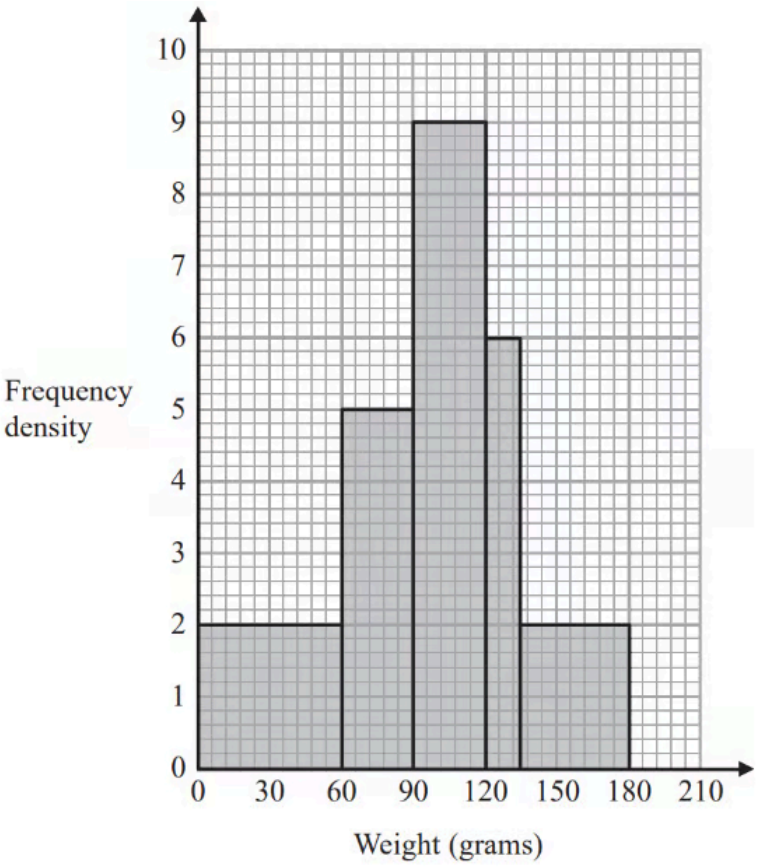
[3]

ii) Explain why your answer to part (i) is only an estimate.

[1]

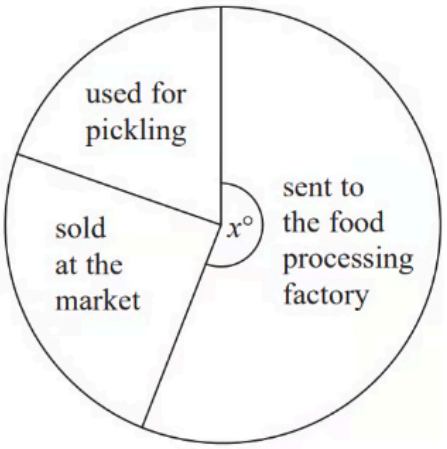
(4 marks)

5 The histogram gives information about the distribution of the weights of some onions grown by a farmer.



Onions less than 60 grams in weight are used for pickling. Onions greater than 120 grams in weight are sold at the market. The rest of the onions are sent to a food processing factory.

A pie chart is drawn using the information opposite to show what the farmer does with the onions he grows.



The angle of the sector for the onions sent to the food processing factory is $x°$.
Work out the value of x.

(4 marks)