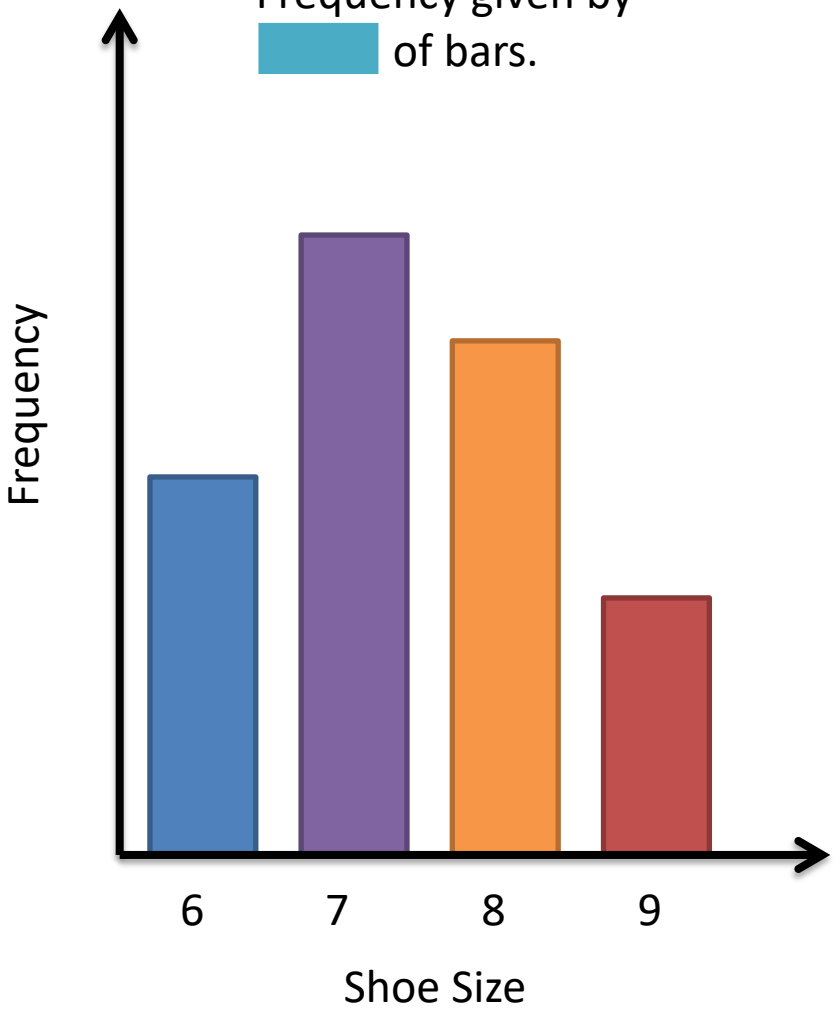
Histograms

Bar Charts vs Histograms

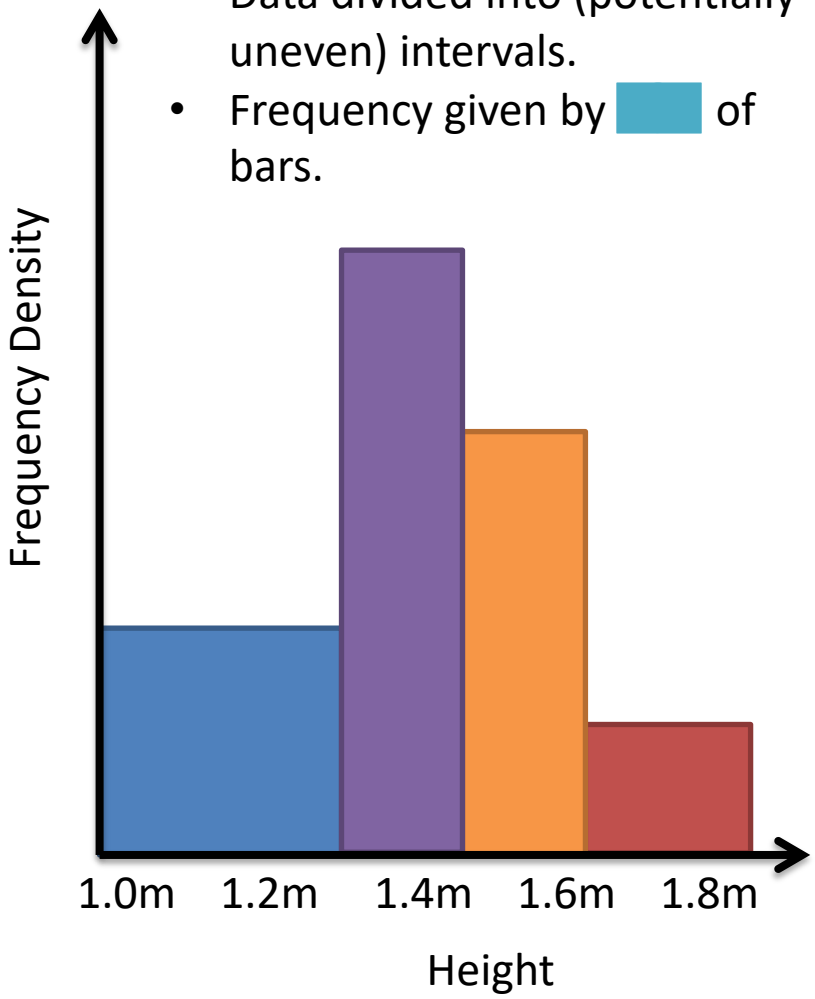
Bar Charts

- For [redacted] data.
- Frequency given by [redacted] of bars.



Histograms

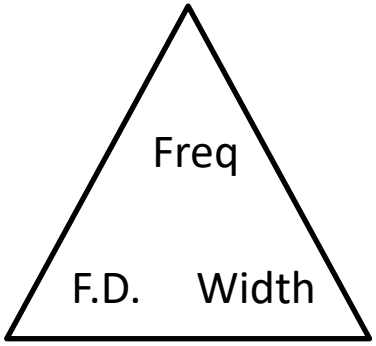
- For [redacted] data.
- Data divided into (potentially uneven) intervals.
- Frequency given by [redacted] of bars.



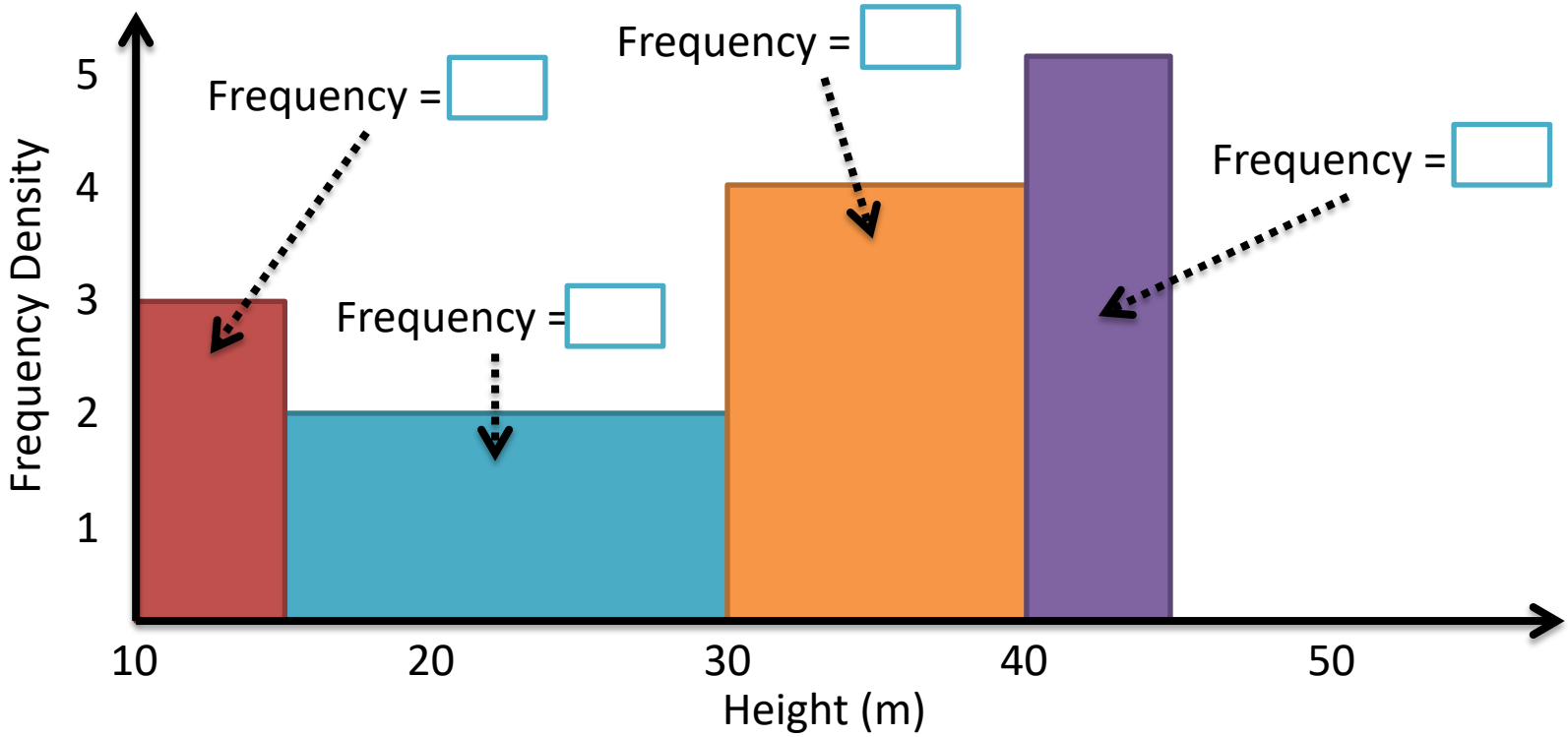
Examples

1

Weight (w kg)	Frequency	Frequency Density
$0 < w \leq 10$	40	
$10 < w \leq 15$	6	
$15 < w \leq 35$		2.6
$35 < w \leq 45$		1



2



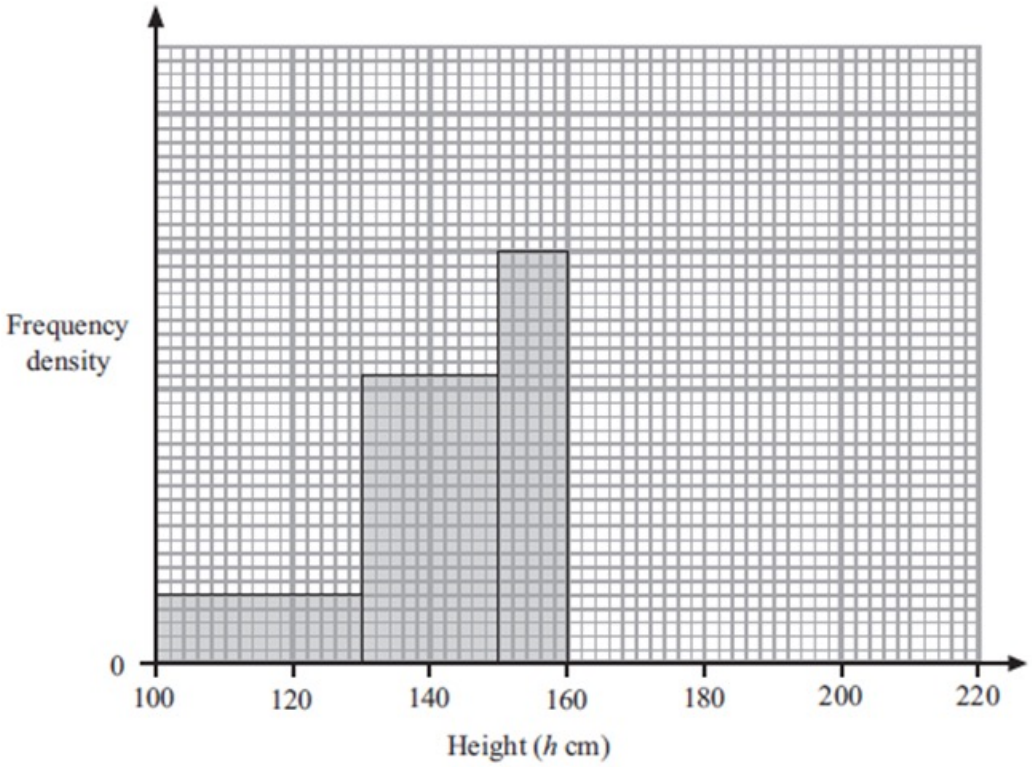
The incomplete table and histogram give some information about the heights (in cm) of some sunflowers.

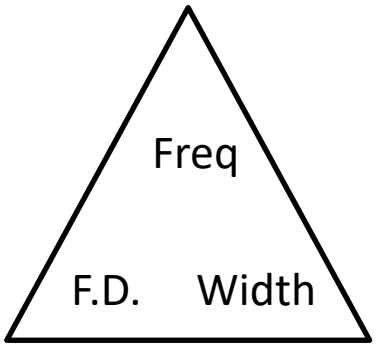
3

Height (h cm)	Frequency	Frequency Density
$100 < h \leq 130$	30	
$130 < h \leq 150$		
$150 < h \leq 160$		
$160 < h \leq 180$	40	
$180 < h \leq 210$	18	

(*a*) Use the histogram to complete the table. **(2)**

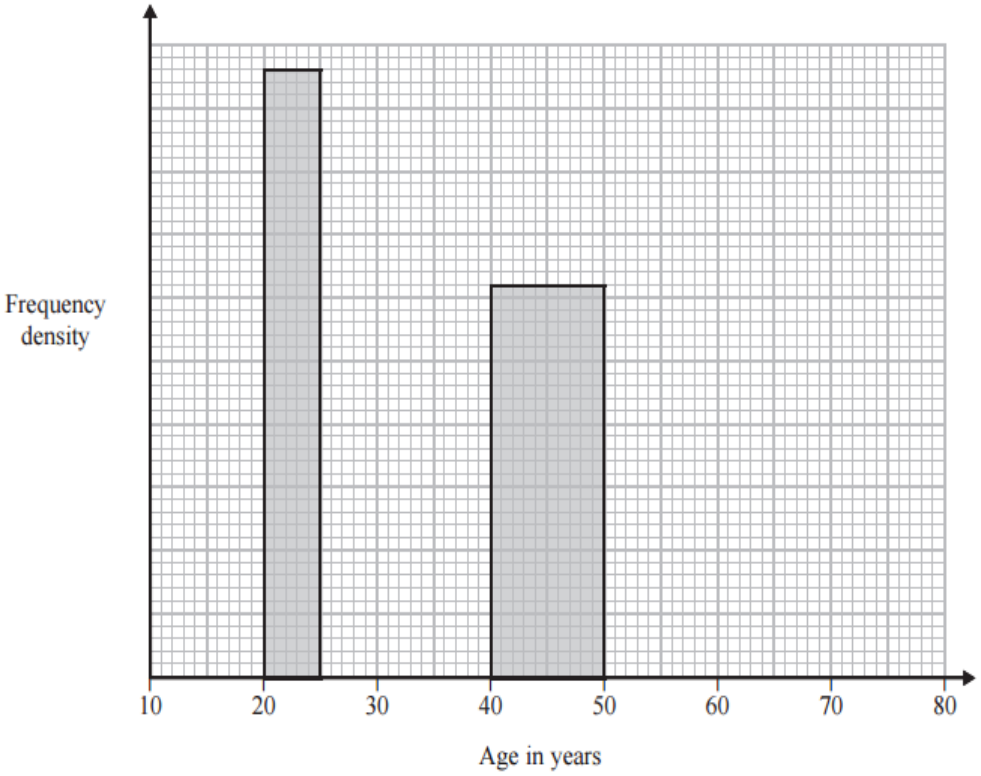
(*b*) Use the table to complete the histogram. **(2)**





Example

The incomplete histogram and the incomplete table show information about the ages of people watching a film in a cinema.



Age (a years)	Number of people
$10 \leqslant a < 20$	38
$20 \leqslant a < 25$	24
$25 \leqslant a < 40$	63
$40 \leqslant a < 50$	
$50 \leqslant a < 80$	24

FD

(a) Use the histogram to complete the table.

(b) Use the table to complete the histogram.

Determining F.D. scale

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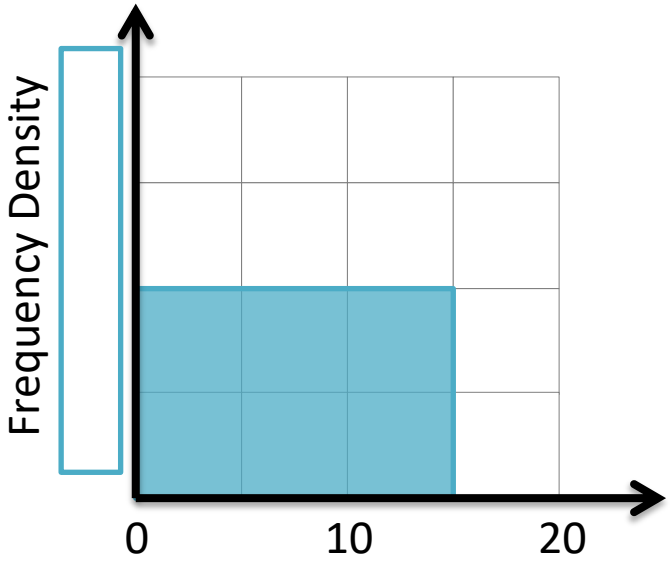
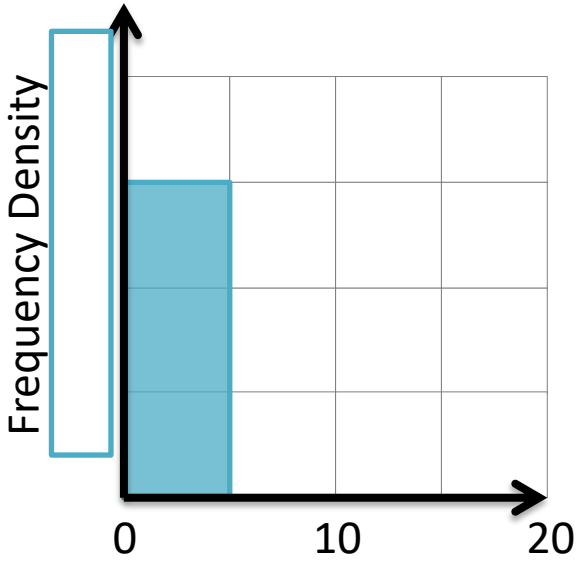
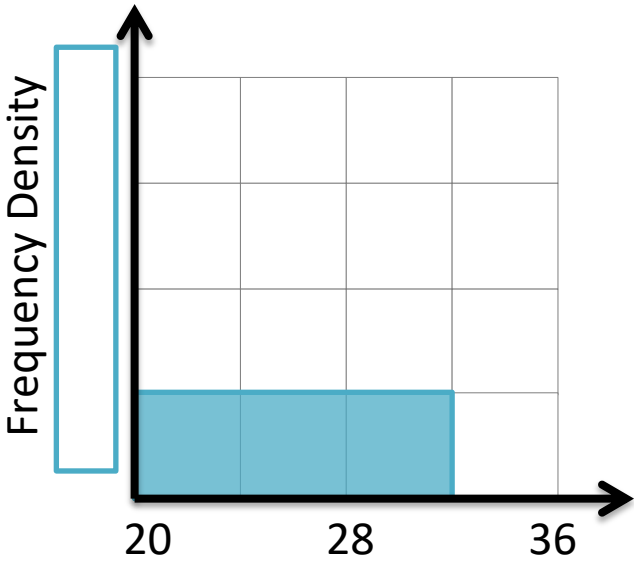
Work out the scales on the frequency density axis.



Height (m)	$0 \leq x < 15$
Frequency	30



Height (m)	$0 \leq x < 5$
Frequency	60



Height (m)	$20 \leq x < 32$
Frequency	6

Question 1

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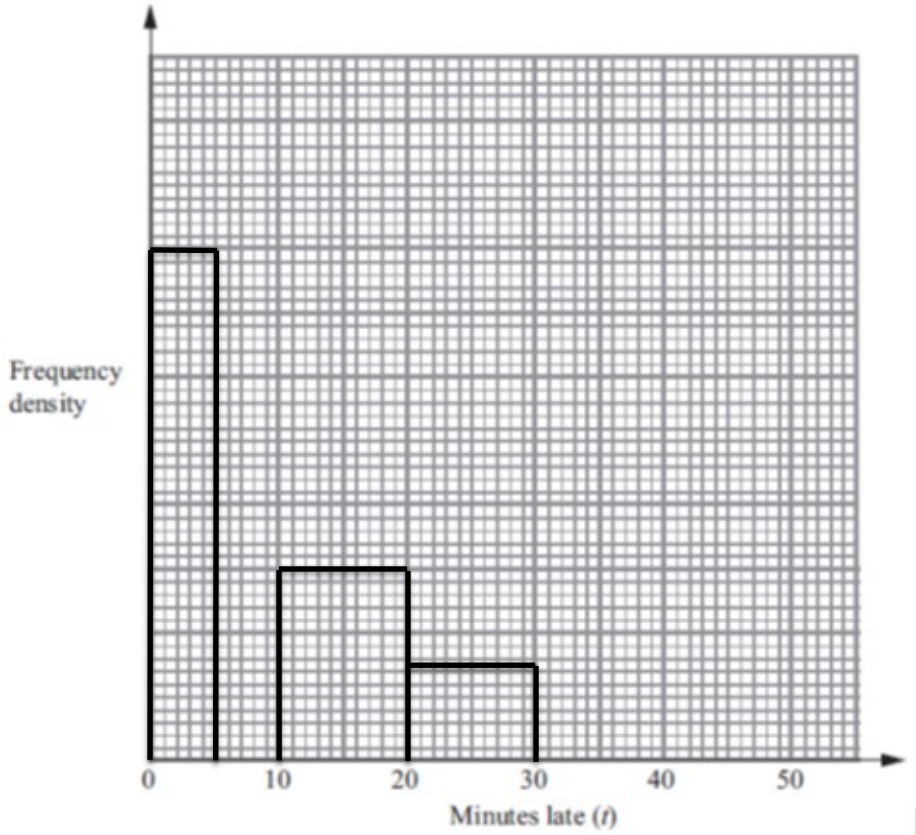
Some trains from Manchester to London were late.
The incomplete table and histogram gives some information about how late the trains we

Minutes late (t)	Frequency
$0 < t \leq 5$	16
$5 < t \leq 10$	10
$10 < t \leq 20$	
$20 < t \leq 30$	
$30 < t \leq 50$	8

FD



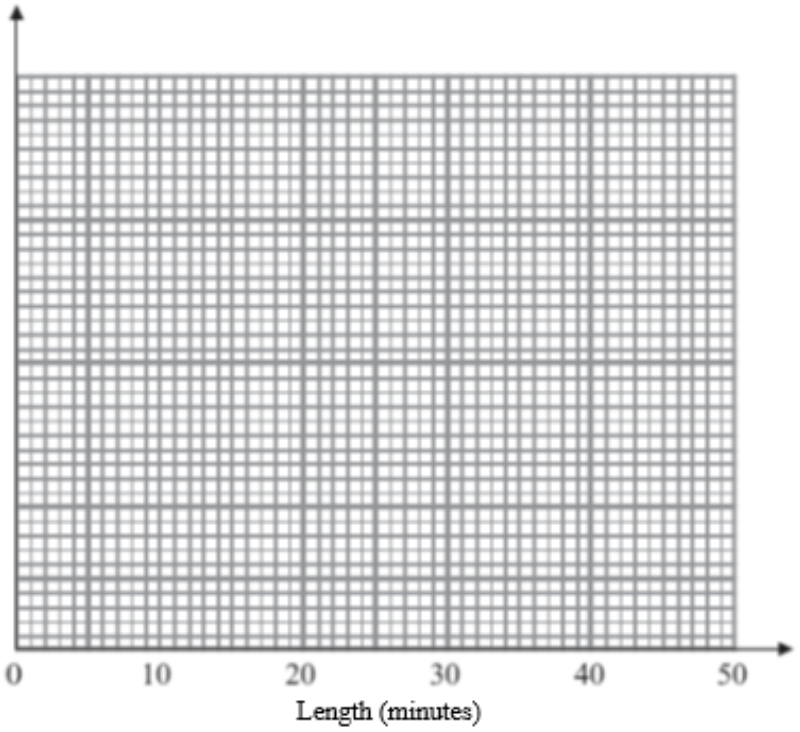
Question 2

A call centre receives 64 telephone calls one morning.
The table gives information about the lengths, in minutes, of these telephone calls.

Length (x) minutes	Frequency
$0 < x \leq 5$	4
$5 < x \leq 15$	10
$15 < x \leq 30$	24
$30 < x \leq 40$	20
$40 < x \leq 45$	6

FD

Draw a histogram for this information.



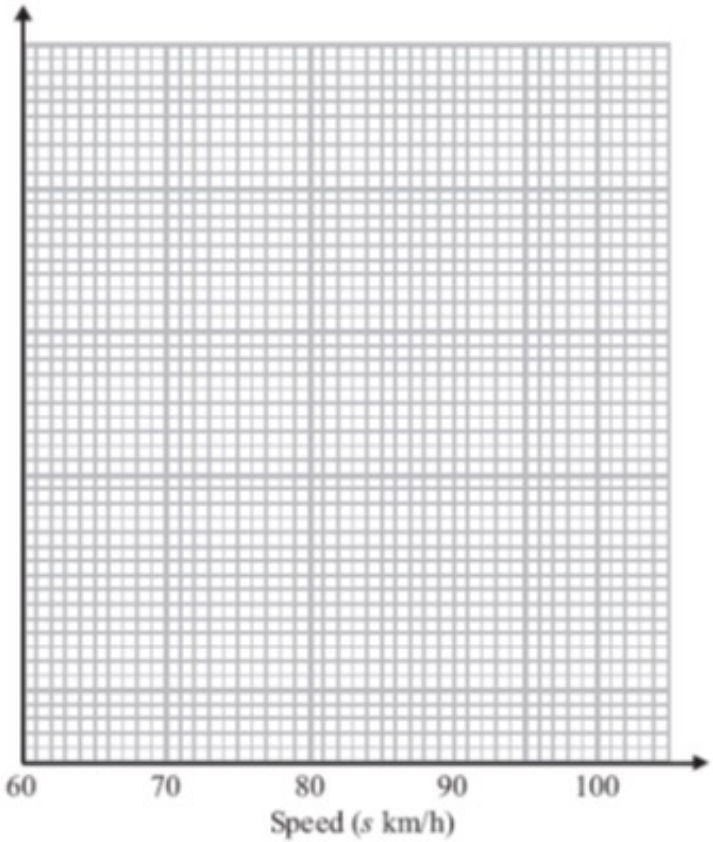
Question 3

The table gives some information about the speeds, in km/h, of 100 cars.

Speed(s km/h)	Frequency
$60 < s \leq 65$	15
$65 < s \leq 70$	25
$70 < s \leq 80$	36
$80 < s \leq 100$	24

FD

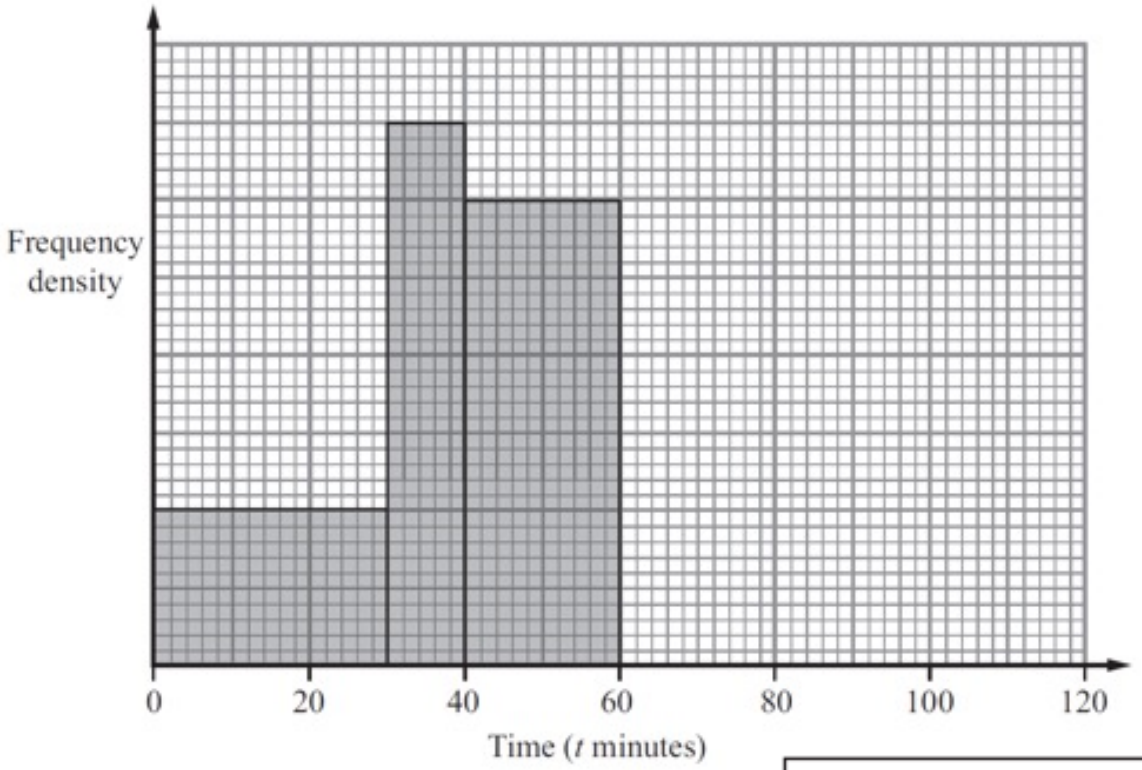
(a) On the grid, draw a histogram for the information in the table.



(b) Work out an estimate for the number of cars with a speed of more than 85 km/h.

Question 4

The incomplete histogram and table give some information about the times, in minute
that cars were parked in a car park.

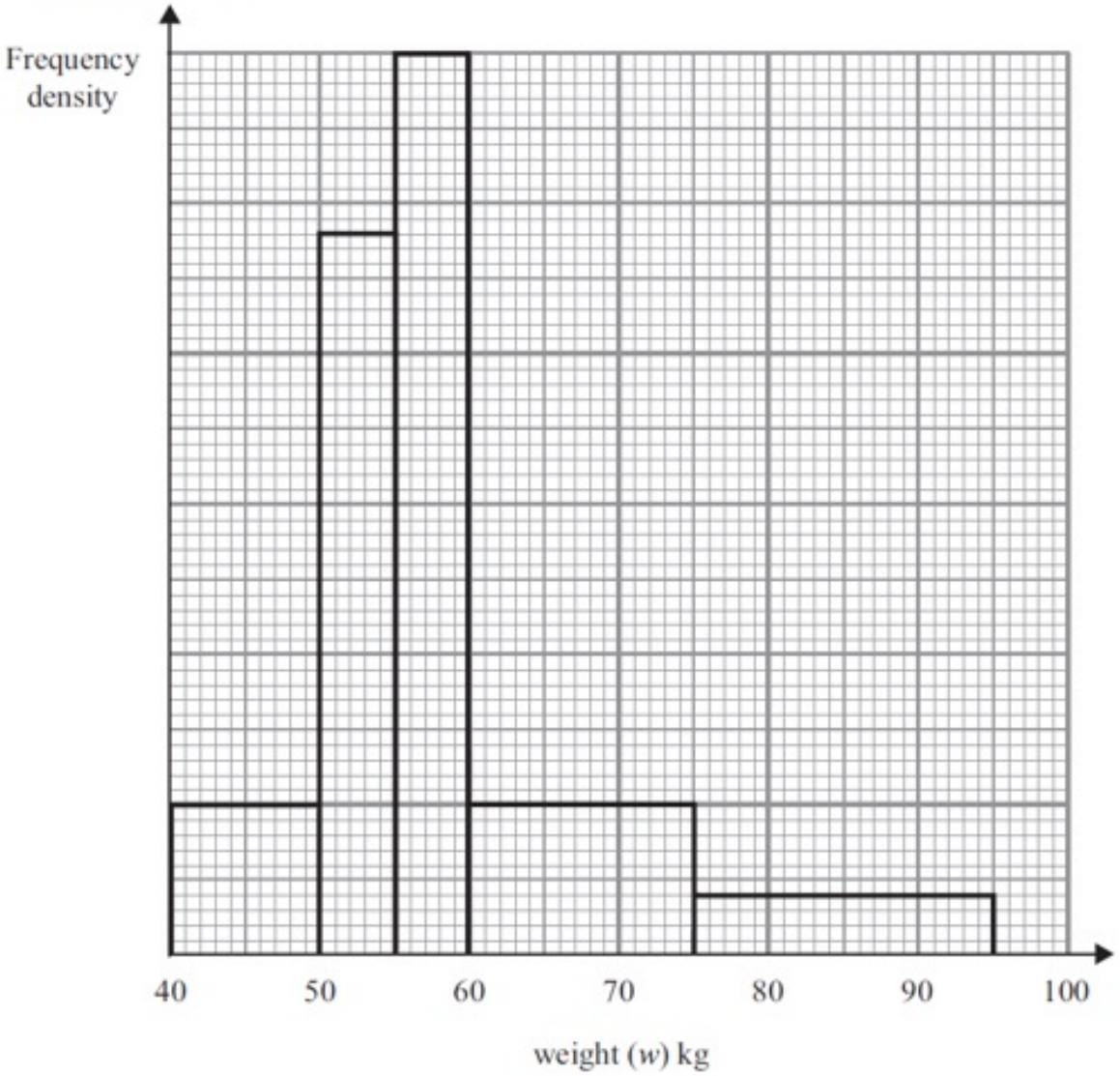


Time (t minutes)	Frequency
$0 < t \leqslant 30$	
$30 < t \leqslant 40$	35
$40 < t \leqslant 60$	
$60 < t \leqslant 80$	30
$80 < t \leqslant 120$	20

FD

Question 5

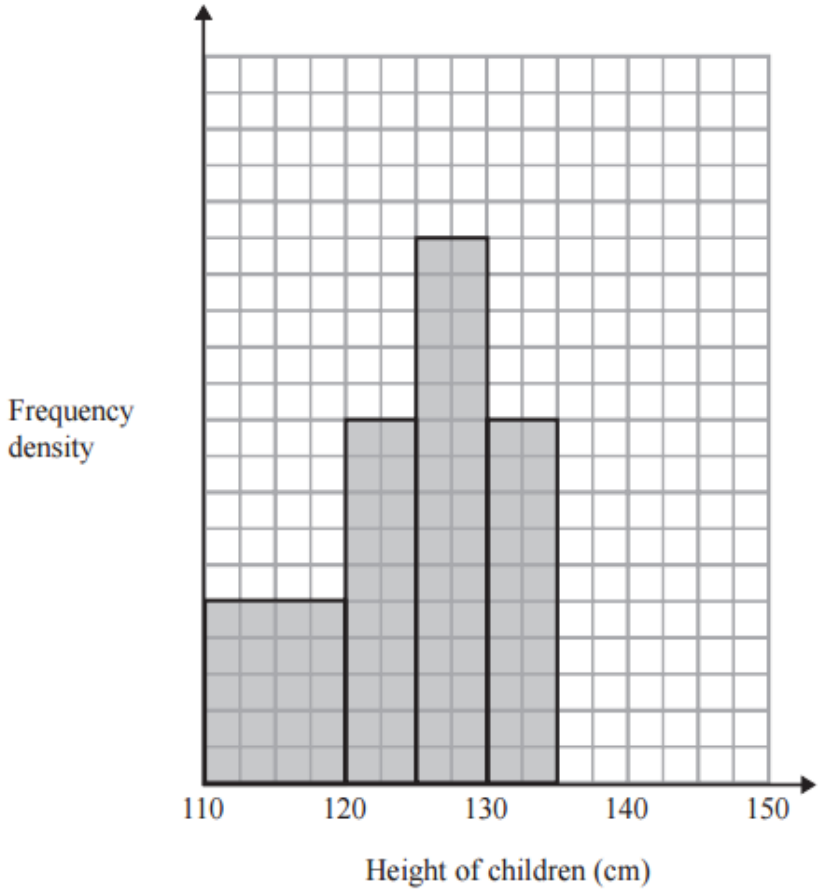
The incomplete table and histogram give some information about the weights of people at a keep-fit session.



Weight (w) kg	Frequency
$40 \leqslant w < 50$	10
$50 \leqslant w < 55$	
$55 \leqslant w < 60$	
$60 \leqslant w < 75$	15
$75 \leqslant w < 95$	8

Harder Histogram Questions

The incomplete histogram shows information about the heights of a group of children.



There were 10 children with heights between 130 cm and 135 cm.

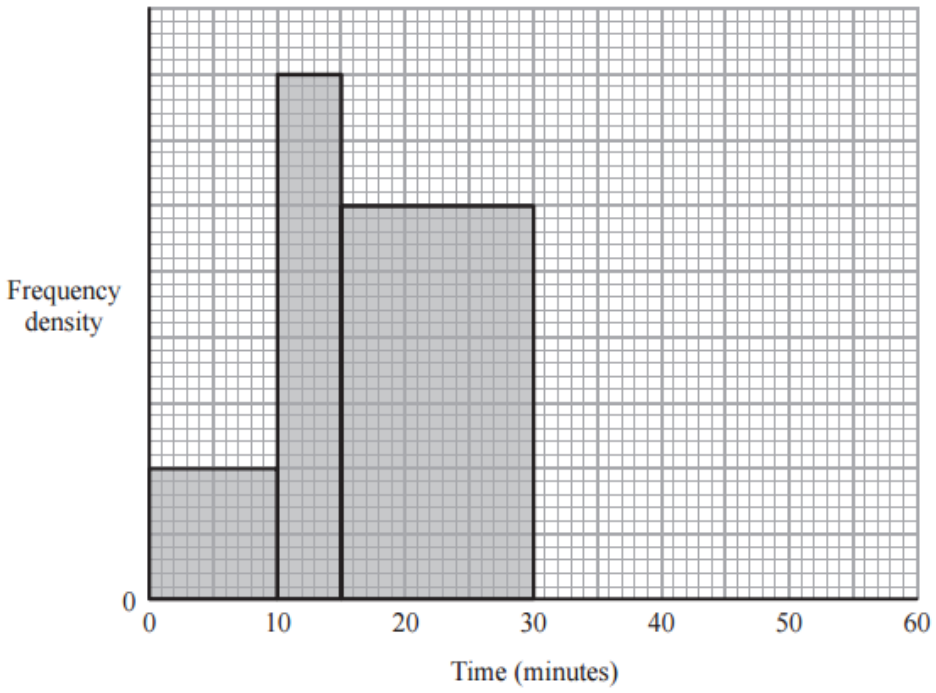
(a) How many children had heights between 110 cm and 130 cm?

There were 6 children with heights between 135 cm and 145 cm.

(b) Show this information on the histogram.

Example

Miss Cook asked each student in her class how long it took them, in minutes, to travel to school that morning.
The incomplete histogram shows information about the times it took the students who took no more than 30 minutes to travel to school.



9 students took between 15 minutes and 30 minutes to travel to school.

(a) How many students took no more than 30 minutes to travel to school?

12 students took between 30 and 55 minutes to travel to school.

(b) Use this information to complete the histogram.

a

(If using square count method, perhaps count big squares rather than little squares.)

b

Proportion Histogram Questions

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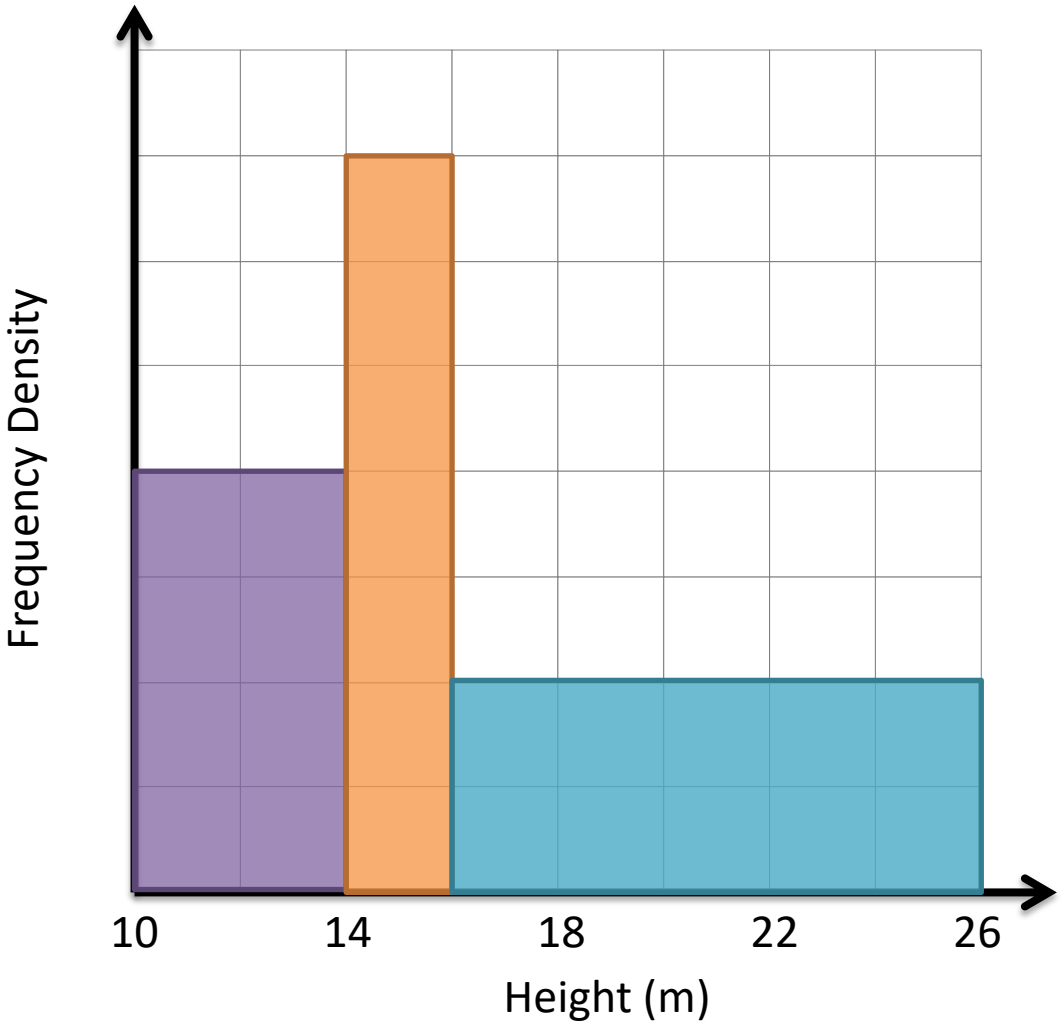
Sometimes you have to find the **proportion** of people/things/animals within some range of values.



Total area =

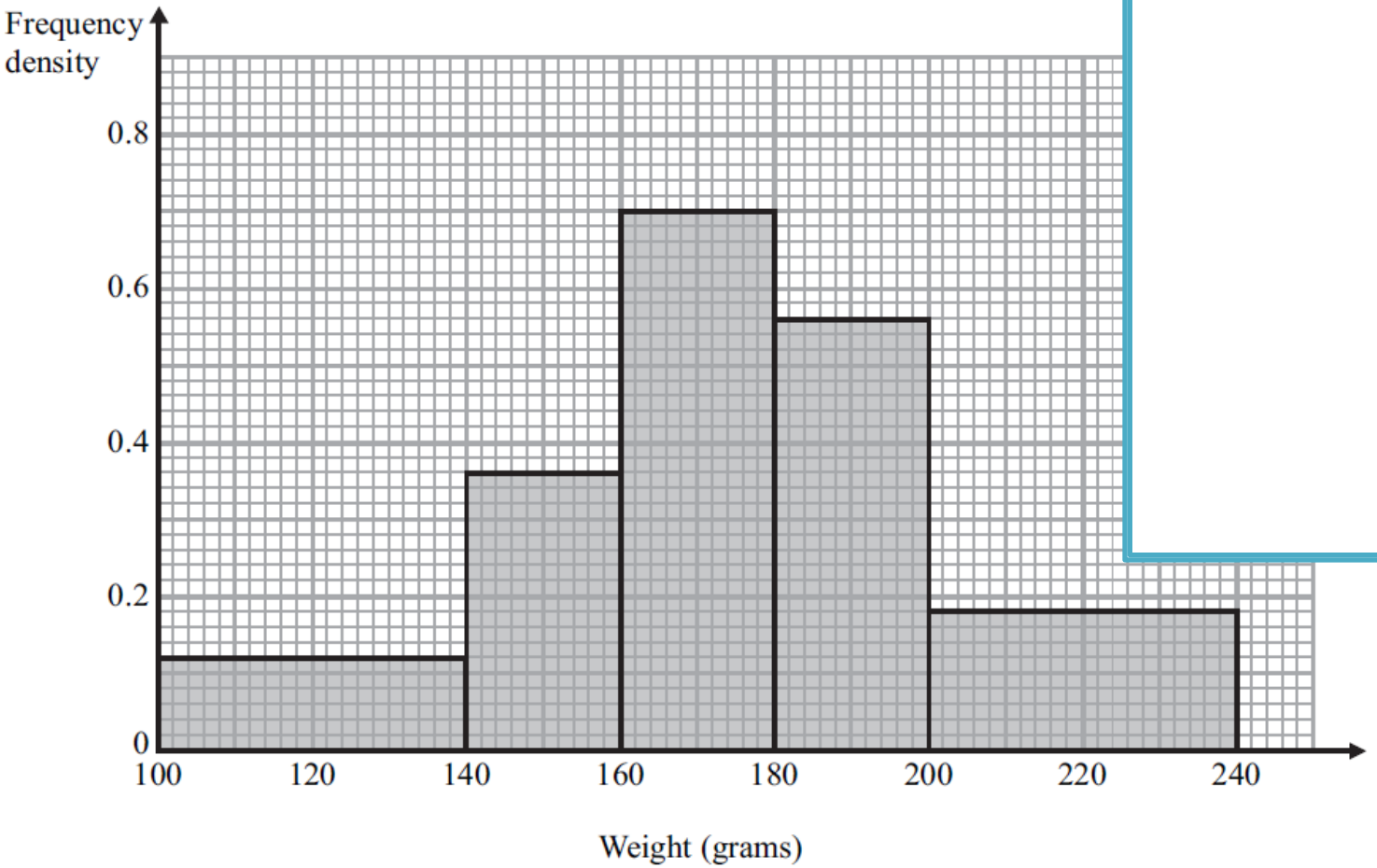
What proportion of people had a height:

Between 10 and 14m:

Between 14 and 18m:

Example

The histogram shows some information about the weights of a sample of apples.

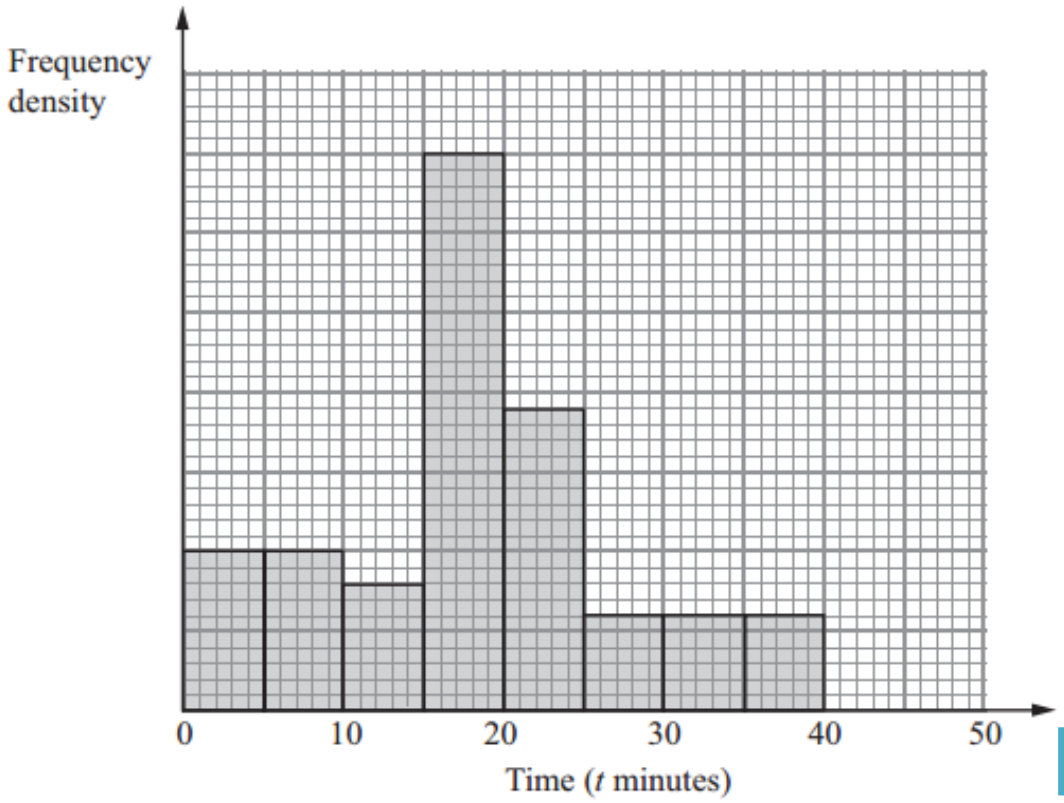


Work out the proportion of apples in the sample with a weight between 140 grams and 200 grams.

Solution:

Question 1

The histogram shows information about the times, t minutes, patients spent at a doctors' surgery on one day.
No patient spent more than 40 minutes at the surgery.



(a) Calculate the percentage of the patients who spent between 25 and 40 minutes at the surgery.

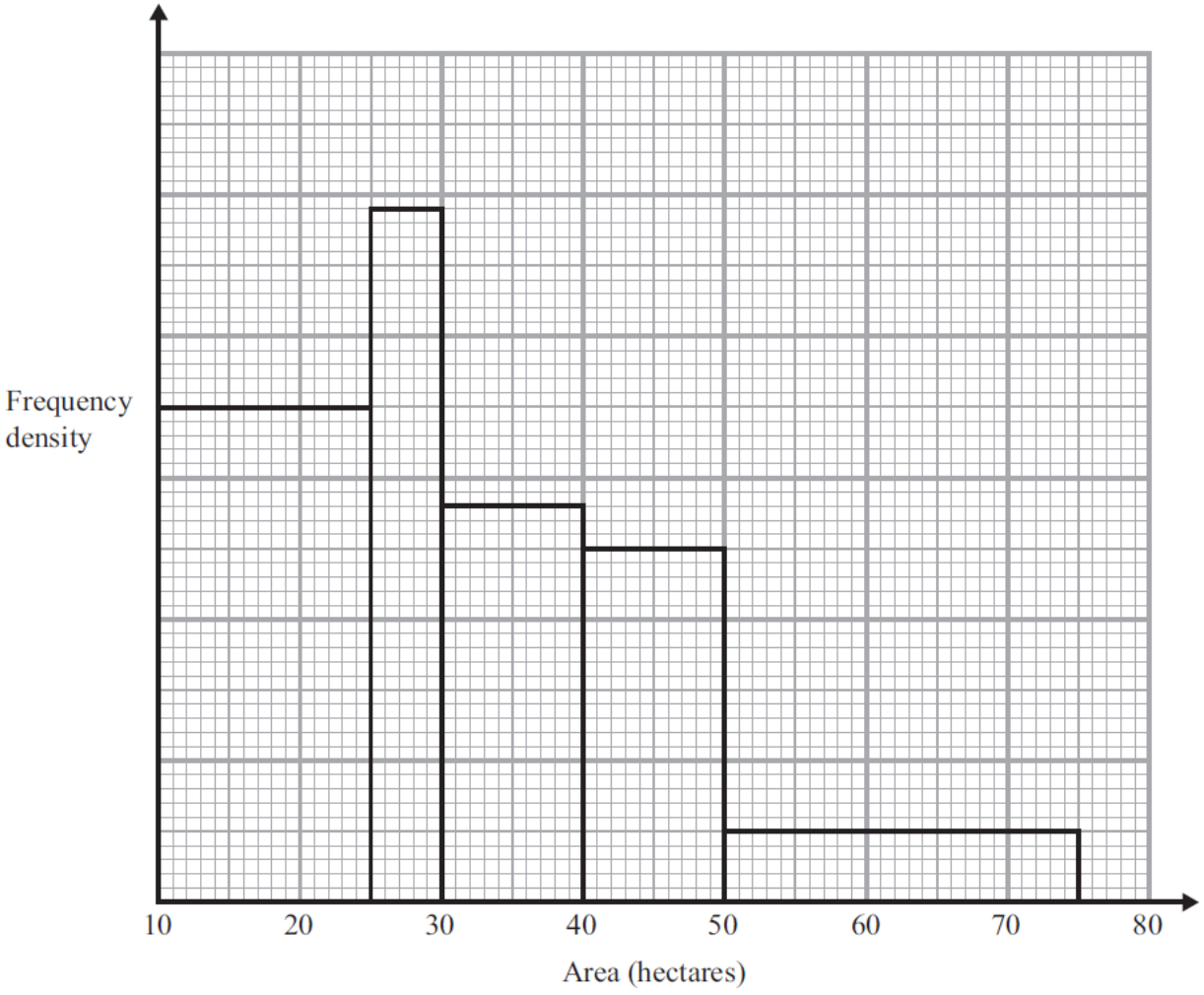
a

(b) 16 patients spent between 10 and 15 minutes at the surgery.
Calculate the total number of patients at the surgery that day.

b

Question 2

The histogram gives information about the areas of 285 farms.

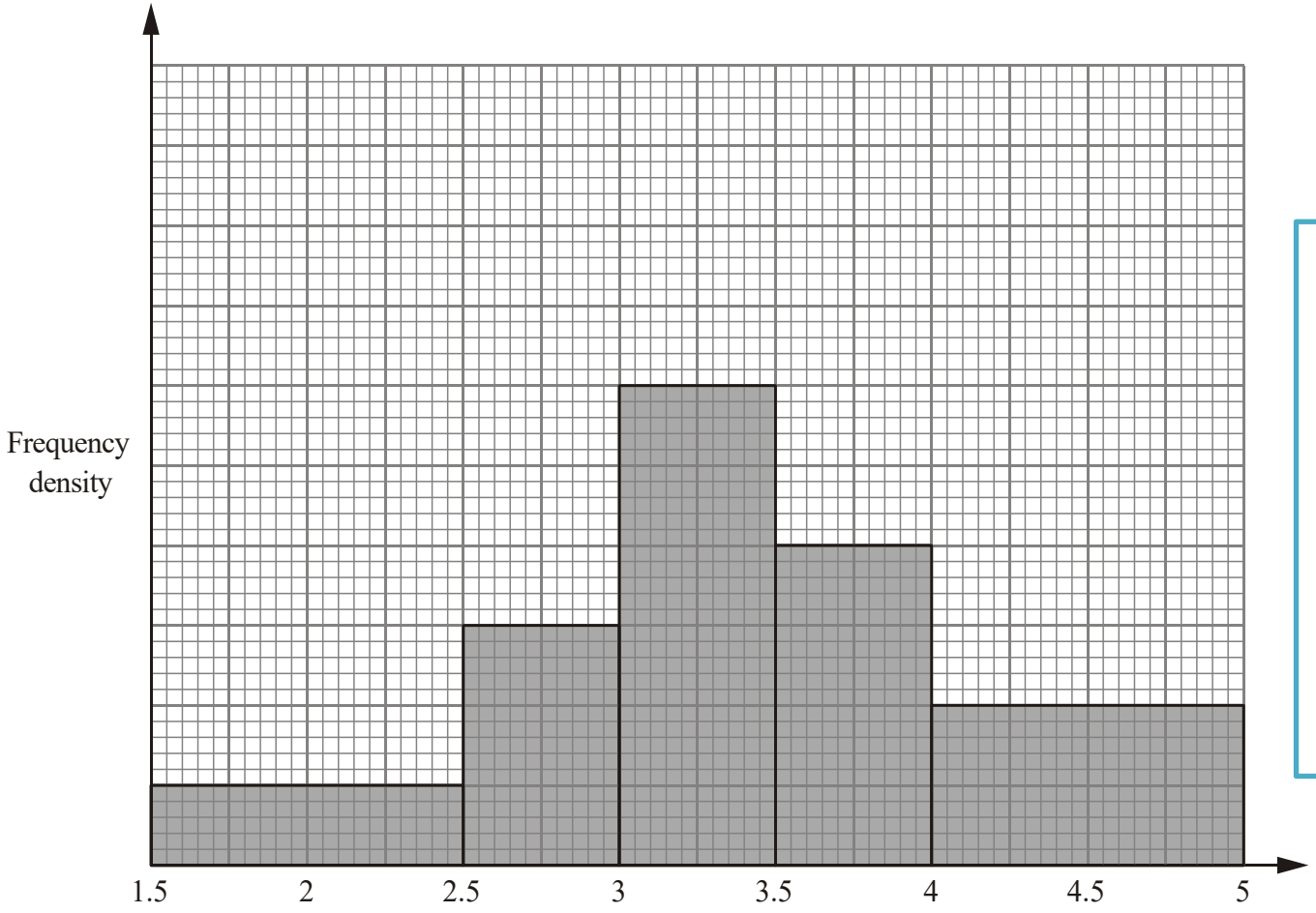


Work out an estimate for the number of these farms with an area greater than 38 hectares.

Answer:

Question 3

The histogram shows information about the lifetime of some batteries.

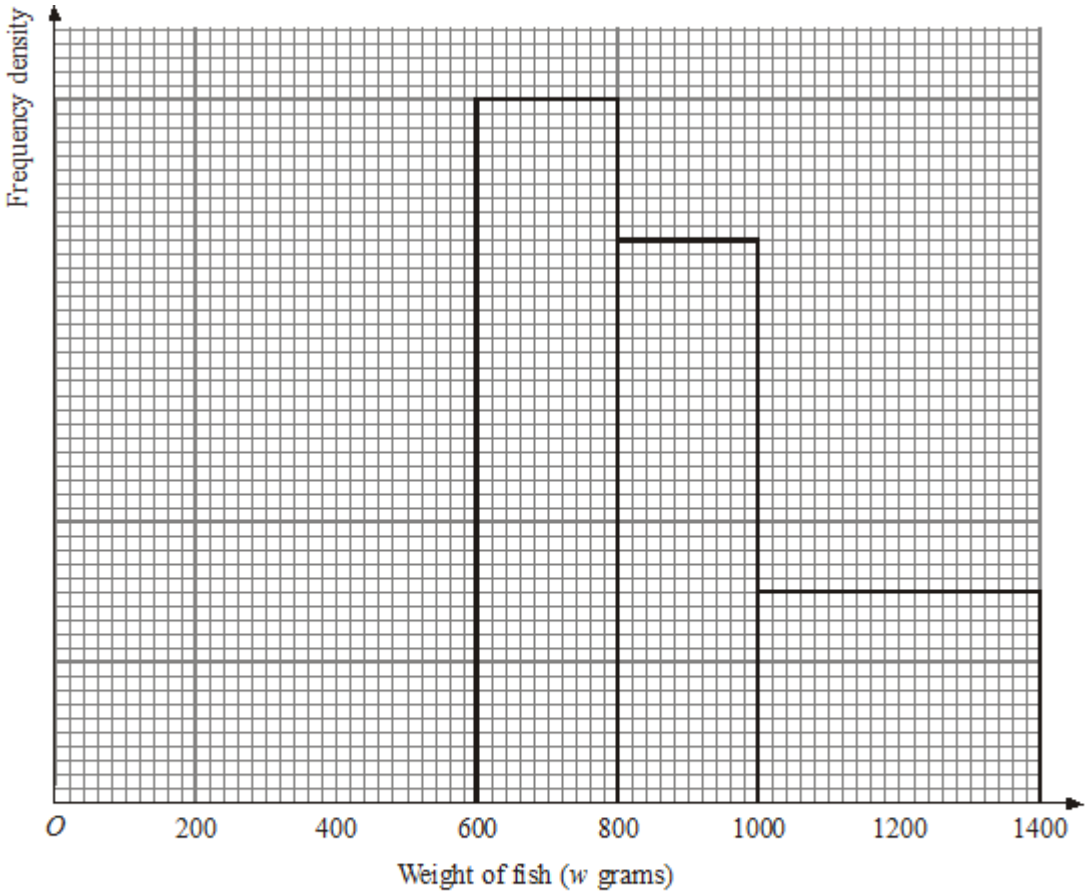


Two of the batteries had a lifetime of between 1.5 and 2.5 years. Find the total number of batteries.

Question 4

The unfinished table and histogram show information about the weight, w grams, of fish that Alan caught each day.

Weight (w grams)	Frequency
$0 < w \leq 400$	8
$400 < w \leq 600$	5
$600 < w \leq 800$	10
$800 < w \leq 1000$	
$1000 < w \leq 1400$	



(a) Use the information in the histogram to complete the table.

(b) Use the information in the table to complete the histogram.