

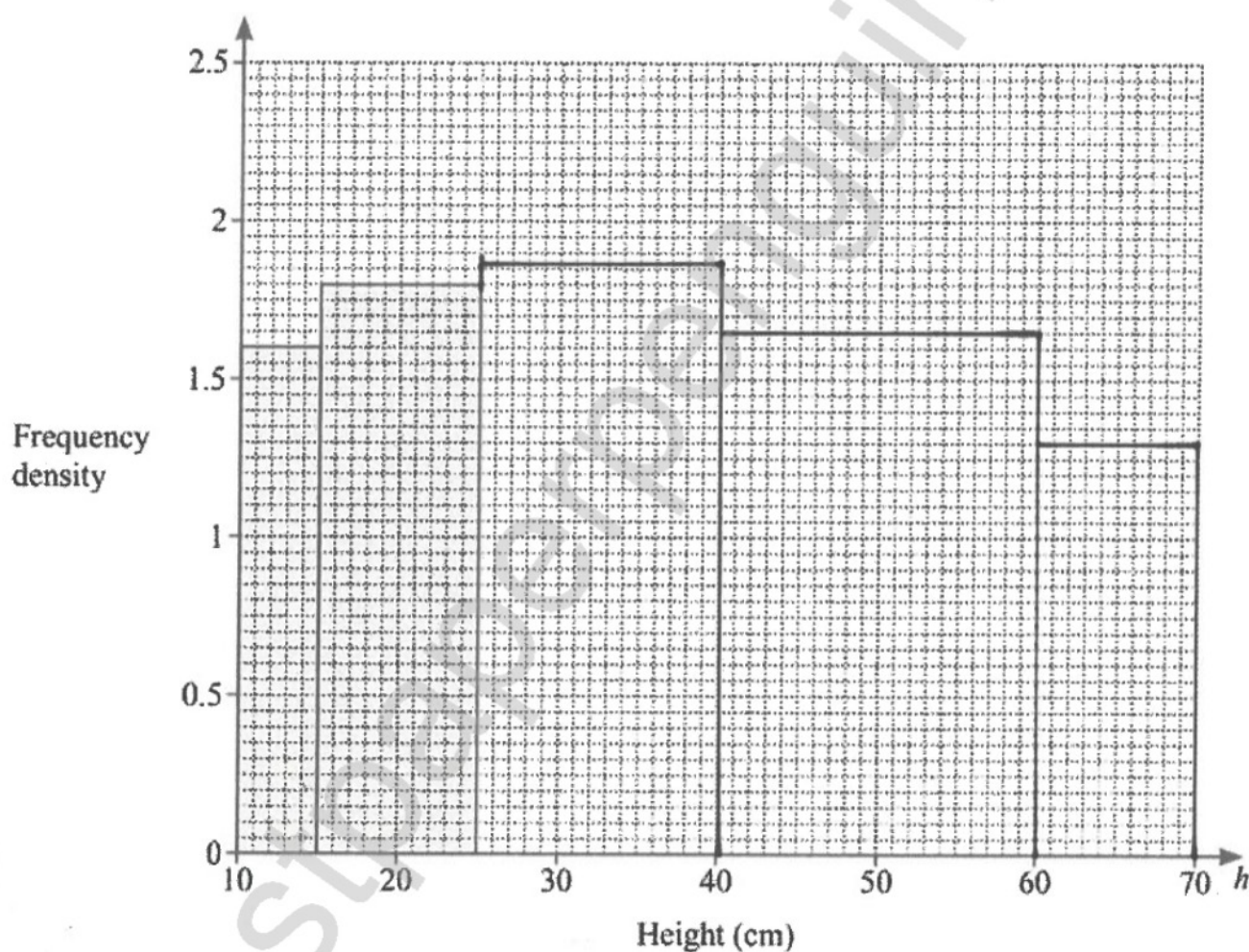
A Histograms

- 3 The height, h cm, of each of 100 plants is recorded.
The table shows information about the heights of these plants.

$$\text{Frequency density} = \frac{\text{Frequency}}{\text{Class width}}$$

Height (h cm)	$10 < h \leq 15$	$15 < h \leq 25$	$25 < h \leq 40$	$40 < h \leq 60$	$60 < h \leq 70$
Frequency	8	18	28	33	13
F.D.	$\frac{8}{5} = 1.6$	$\frac{18}{10} = 1.8$	$\frac{28}{15} = 1.87$	$\frac{33}{20} = 1.65$	$\frac{13}{10} = 1.3$

- (a) Complete the histogram to show this information.
The first two blocks have been drawn for you.

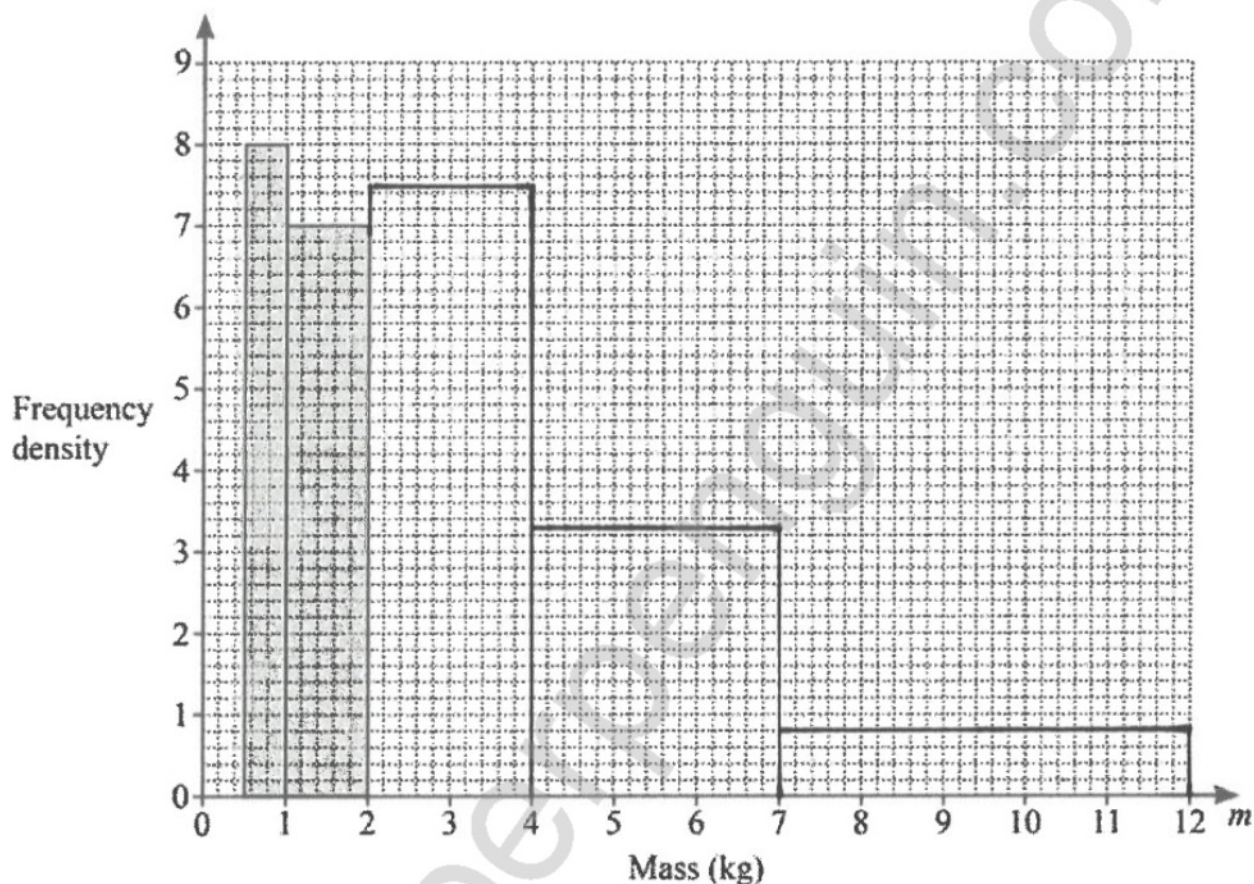


[3]

- 4 (a) The mass, m kg, of each of 40 parcels in a warehouse is recorded.
The table shows information about the masses of these parcels.

Mass (m kg)	$0.5 < m \leq 1$	$1 < m \leq 2$	$2 < m \leq 4$	$4 < m \leq 7$	$7 < m \leq 12$
Frequency	4	7	15	10	4
F.D.	8	7	7.5	3.33	0.8

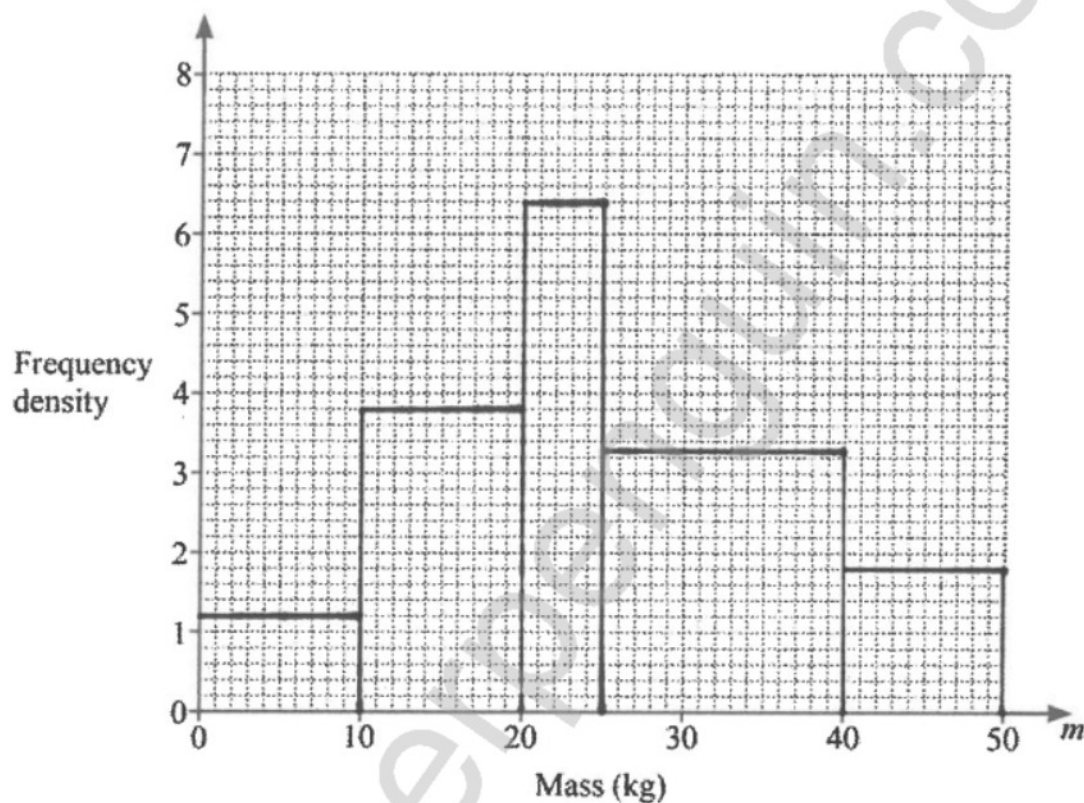
- (i) Complete the histogram to show this information.



- 7 Information about the mass, m kg, of each of 150 children is recorded in the frequency table.

Mass (m kg)	$0 < m \leq 10$	$10 < m \leq 20$	$20 < m \leq 25$	$25 < m \leq 40$	$40 < m \leq 50$
Frequency	12	38	32	50	18
F.D.	1.2	3.8	6.4	3.33	1.8

- (b) Draw a histogram to show the information in the table.



[4]

- 15 Virat records the height of each of 80 sunflowers.
The results are shown in the table.

Height (h m)	$1.2 < h \leq 1.5$	$1.5 < h \leq 1.6$	$1.6 < h \leq 1.7$	$1.7 < h \leq 1.9$
Frequency	12	20	34	14

(a) Calculate an estimate of the mean height.

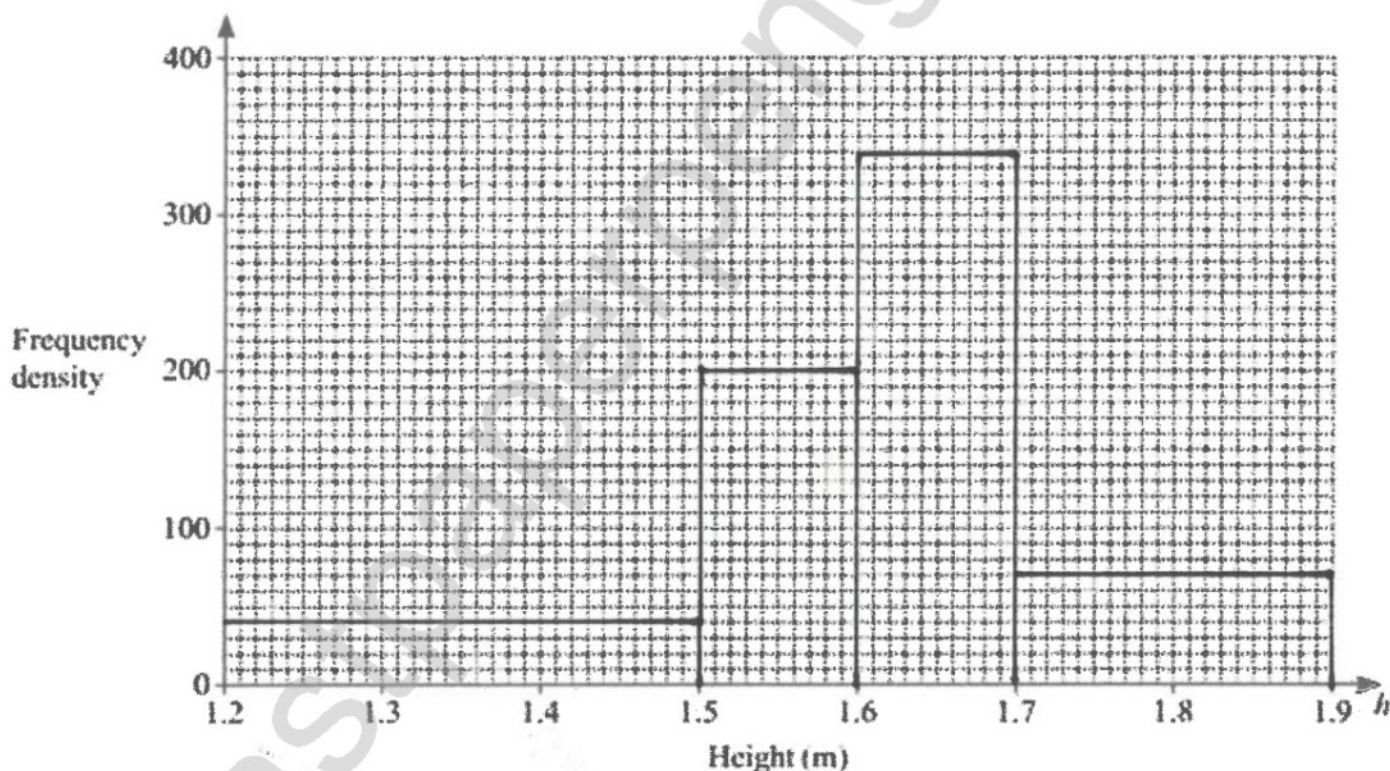
mid-point (x)	frequency (f)	$f \times x$
1.35	12	16.2
1.55	20	31
1.65	34	56.1
1.8	14	25.2

$$\begin{aligned}
 \text{mean} &= \frac{\text{sum of } f \times x}{\text{sum of } f} \\
 &= \frac{16.2 + 31 + 56.1 + 25.2}{80} \\
 &= 1.60625
 \end{aligned}$$

1.60625 m [4]

↑ exact, so don't round

(b) Draw a histogram to show the information in the table.

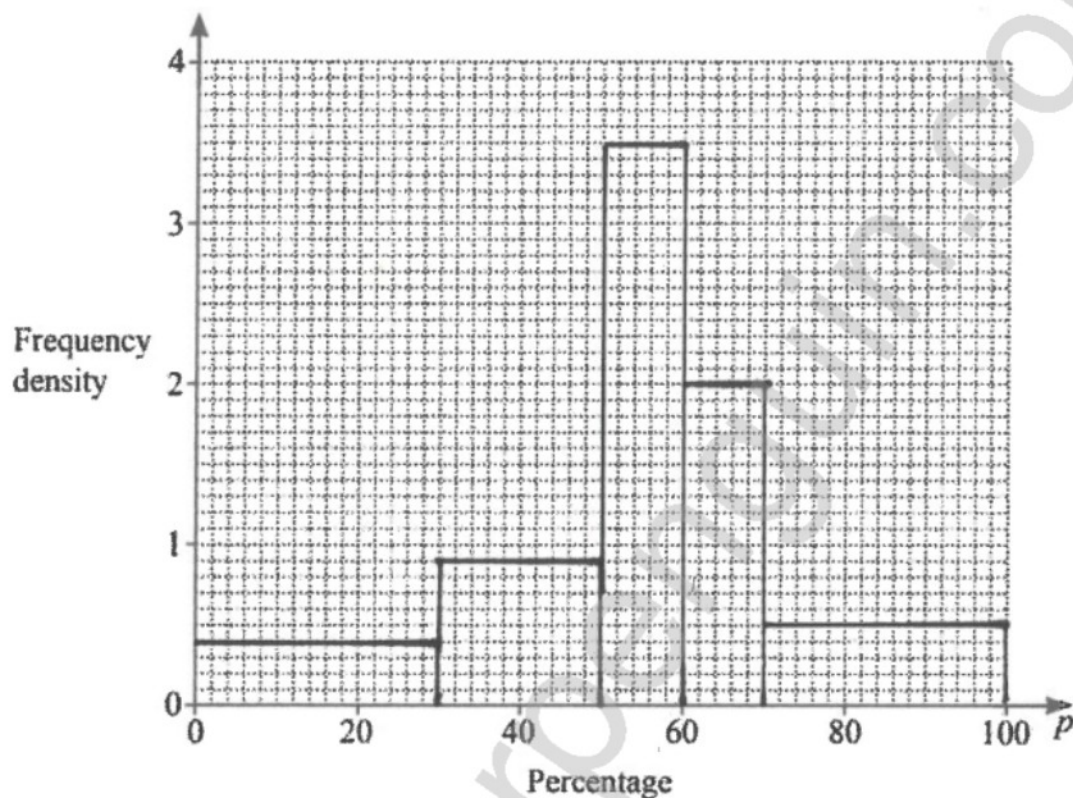


[3]

(c) The table shows the percentage scored by each of 100 students in their final exam.

Percentage (p)	$0 < p \leq 30$	$30 < p \leq 50$	$50 < p \leq 60$	$60 < p \leq 70$	$70 < p \leq 100$
Frequency	12	18	35	20	15
F.D.	0.4	0.9	3.5	2	0.5

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

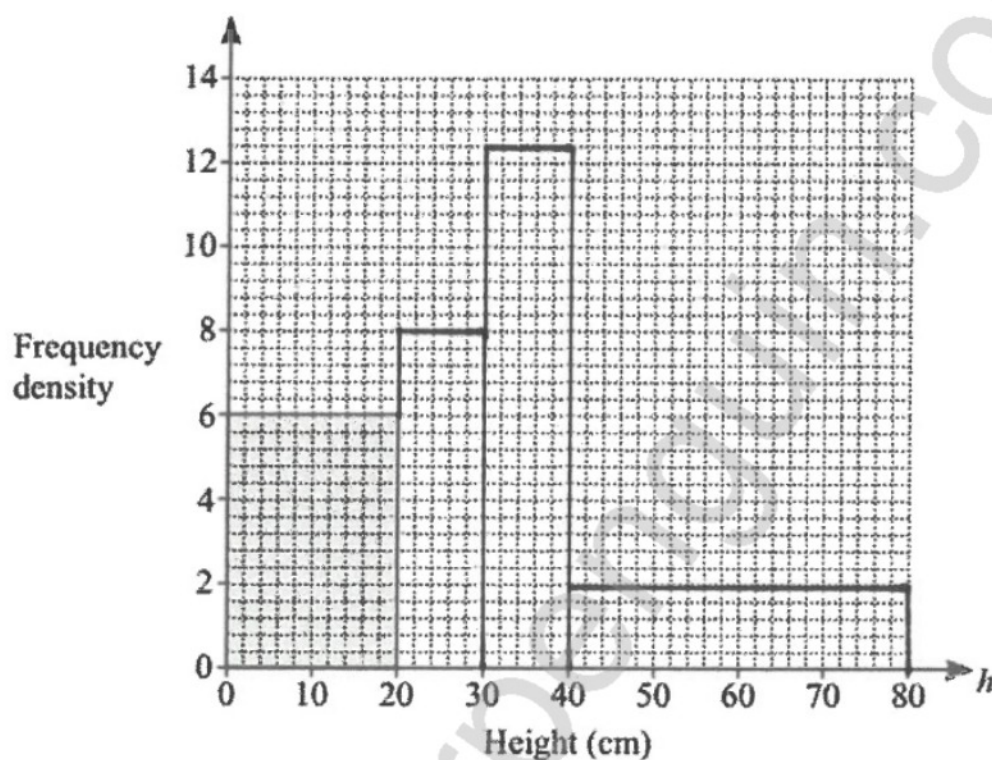


[4]

(b) The heights are also shown in the frequency table.

Height (h cm)	$0 < h \leq 20$	$20 < h \leq 30$	$30 < h \leq 40$	$40 < h \leq 80$
Frequency	120	80	124	76
F.D.	6	8	12.4	1.9

Complete the histogram to show this information.



[3]

- 22 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
F.D.	0.9	3.6	4.4	1.5	0.6

- (b) 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	6.0	2.4
F.D.	0.9	3.6	4.4	1.5	0.6

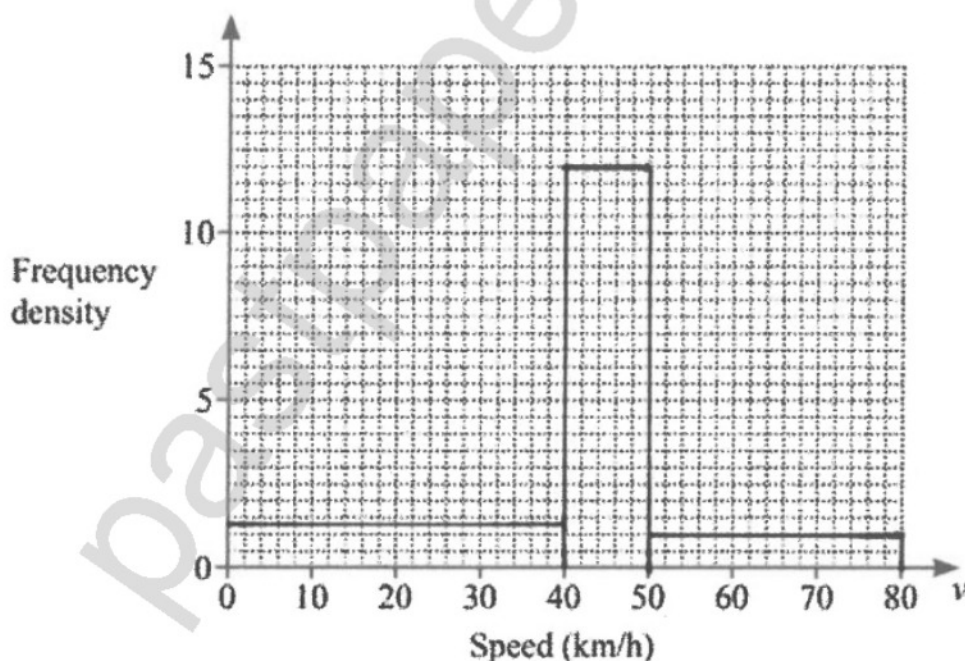
↑
from above

[3]

- (d) A new frequency table is made by combining intervals.

Speed (v km/h)	$0 < v \leq 40$	$40 < v \leq 50$	$50 < v \leq 80$
Frequency	50	120	30
F.D.	1.25	12	1

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



[3]

- 23 Some students record their reaction times.
The table shows the results.

Reaction time (t seconds)	$0 < t \leq 6$	$6 < t \leq 10$
Frequency	18	16

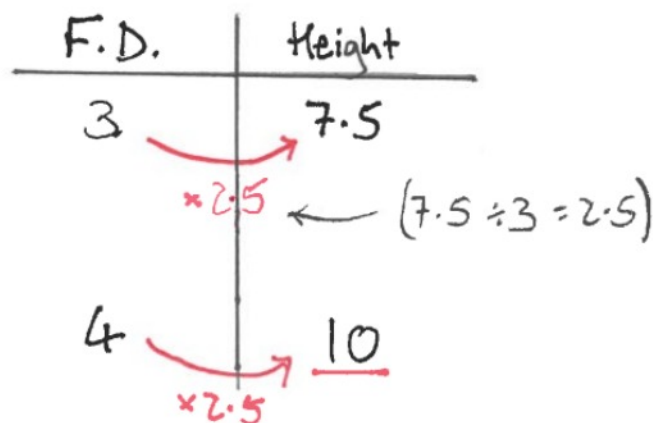
F.D.

3

4

On a histogram, the height of the block for the $0 < t \leq 6$ interval is 7.5 cm.

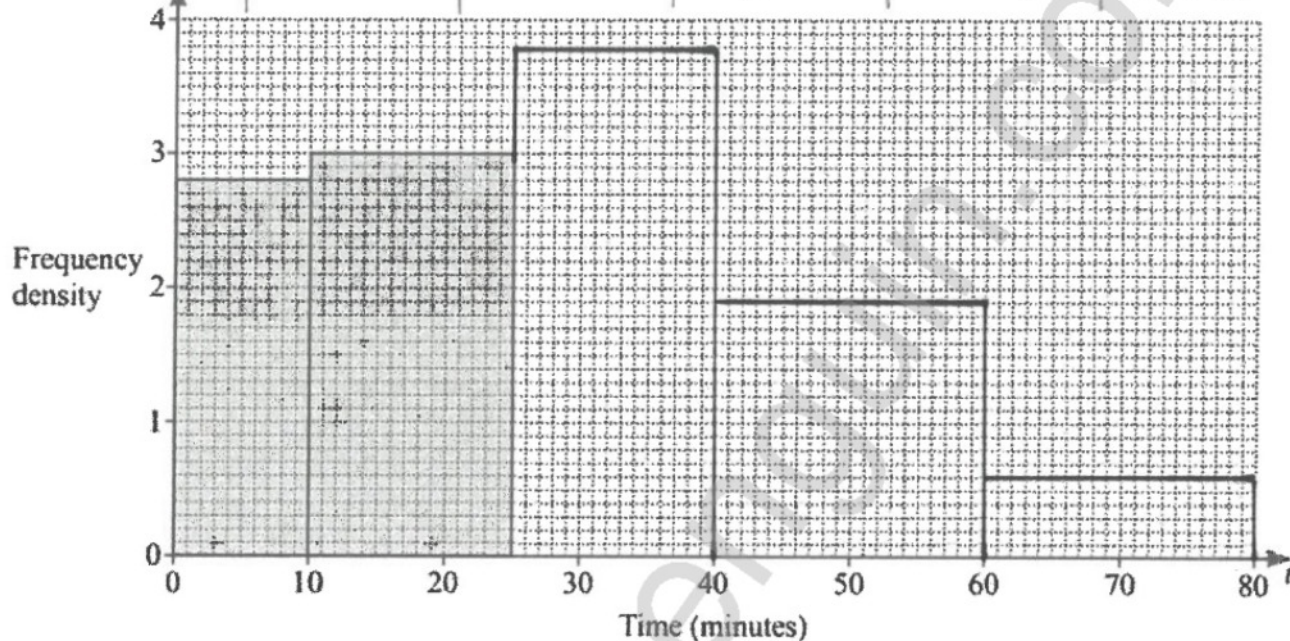
Calculate the height of the block for the $6 < t \leq 10$ interval.



..... 10 cm [2]

- 5 Indira records the time taken for workers in her company to travel to work.
The table and the histogram each show part of this information.

Time (t minutes)	$0 < t \leq 10$	$10 < t \leq 25$	$25 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 80$
Frequency	$2.8 \times 10 = \underline{28}$	$3 \times 15 = \underline{45}$	57	38	12
F.D.	2.8	3	3.8	1.9	0.6



- (a) Complete the table and the histogram.

- (b) 150 students each record how far they can throw a tennis ball.
The table shows the results.

Distance (d metres)	$0 < d \leq 20$	$20 < d \leq 30$	$30 < d \leq 35$	$35 < d \leq 45$	$45 < d \leq 60$
Frequency	4	38	40	53	15
F.D.	0.2	3.8	8	5.3	1

- (ii) A histogram is drawn to show this information.
The height of the bar representing $30 < d \leq 35$ is 12 cm.

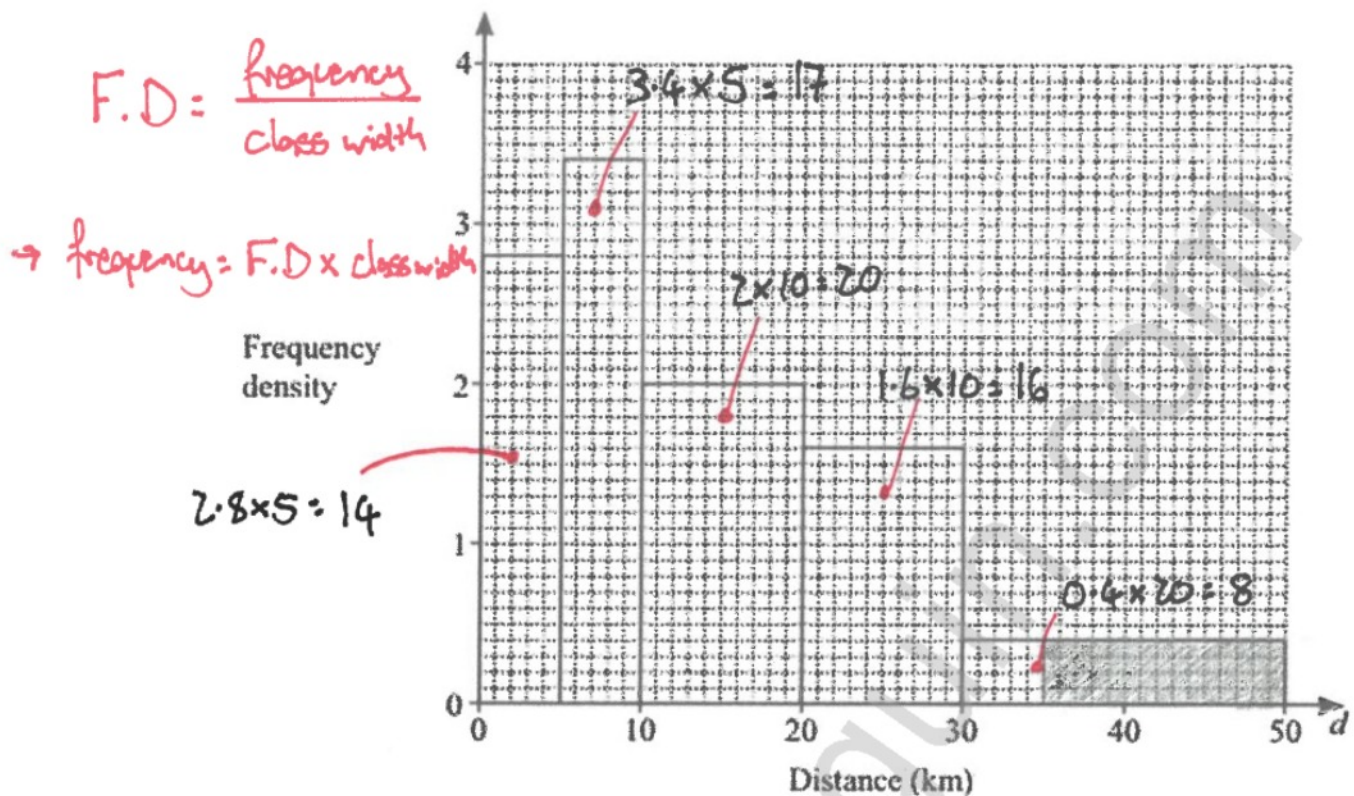
Calculate the height of each of the other bars.

Distance (d metres)	Frequency	Height of bar (cm)	F.D
$0 < d \leq 20$	4	0.3	0.2
$20 < d \leq 30$	38	5.7	3.8
$30 < d \leq 35$	40	12	8
$35 < d \leq 45$	53	7.95	5.3
$45 < d \leq 60$	15	1.5	1

$\times 1.5$

[3]

24 The histogram shows information about the distance some people travel to work.



(a) Use the histogram to complete the table.

Distance (d /km)	Number of people
$0 < d \leq 5$	14
$5 < d \leq 20$	37
$20 < d \leq 50$	24

[3]

(b) The people who travel a distance greater than 35 km to work have a car allowance.

Calculate an estimate of the number of these people who have a car allowance.

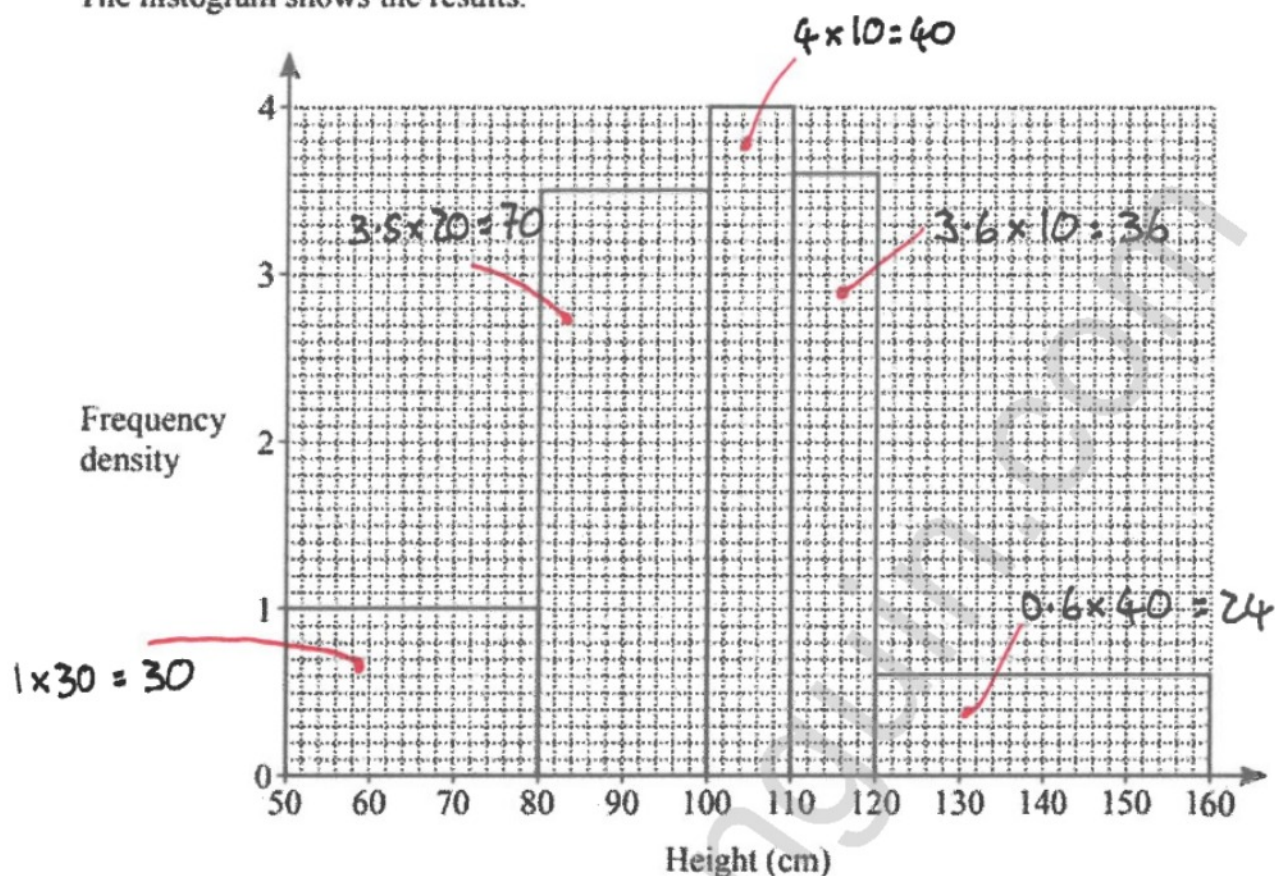
Shaded area on histogram:

$$15 \times 0.4 = 6$$

6

[1]

- (d) The height, in cm, of each of 200 plants is measured.
The histogram shows the results.



Calculate an estimate of the mean height.
You must show all your working.

mid-point (x)	frequency (f)	$f \times x$
65	30	1950
90	70	6300
105	40	4200
115	36	4140
140	24	3360

$$\begin{aligned}
 \text{mean} &= \frac{\text{sum of } f \times x}{\text{sum of } f} \\
 &= \frac{1950 + 6300 + 4200 + 4140 + 3360}{200} \\
 &= \frac{19950}{200} \\
 &= 99.75 \text{ cm [6]}
 \end{aligned}$$