



EXAM PAPERS PRACTICE

GCSE OCR Math J560

Histograms

Answers

*"We will help you to
achieve A Star "*



Answer 1

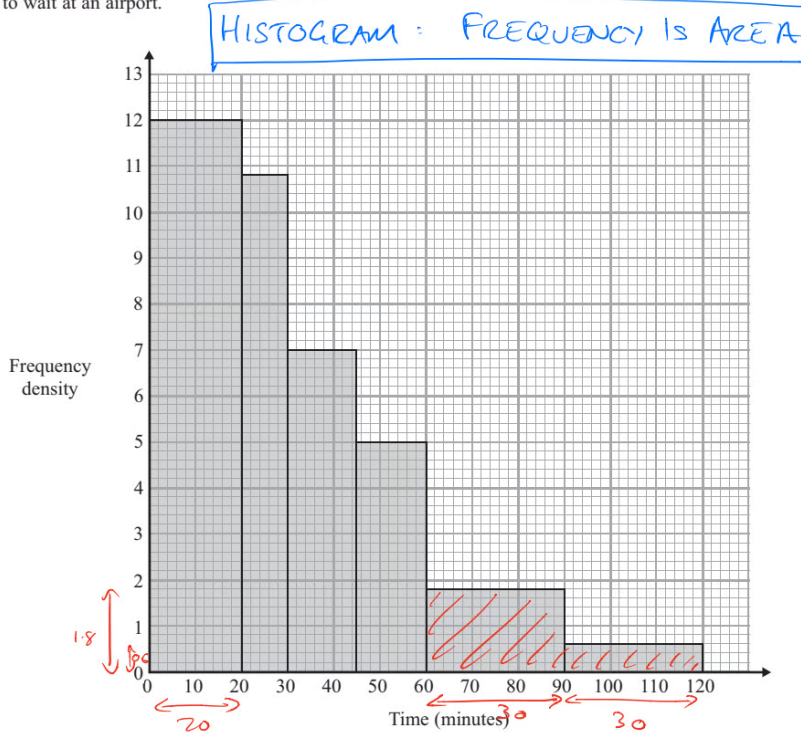
(b) Work out an estimate for the number of cars with a speed of more than 85 km/h.

$$\begin{aligned} F &= FD \times CW = 1.2 \times 15 \\ &= 10 \times 1.2 + 5 \times 1.2 \\ &= 12 + 6 \\ &= \underline{\underline{18}} \text{ CARS} \end{aligned}$$



Answer 2

The histogram shows information about the times, in minutes, that some passengers had to wait at an airport.



Work out the percentage of the passengers who had to wait for more than one hour.

$$\begin{aligned}\text{No OF PAX} > 1 \text{ HOUR} &= 30 \times 1.8 + 30 \times 0.6 \\ &= \underline{72}\end{aligned}$$

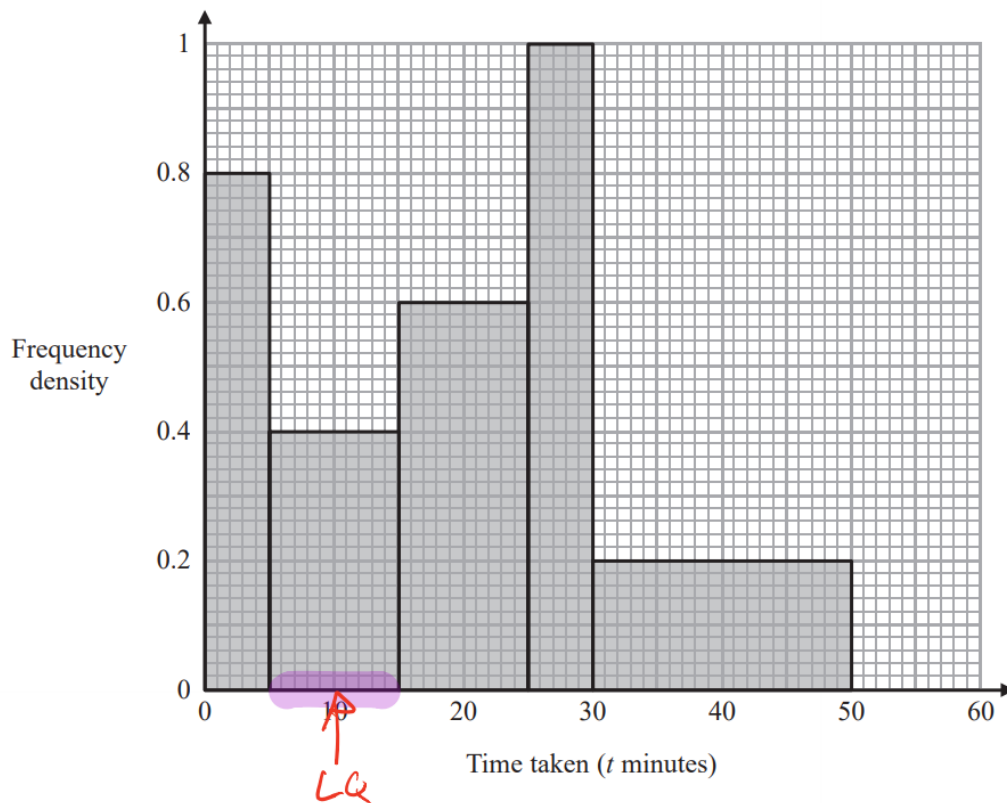
$$\begin{aligned}\text{TOTAL NO OF PAX} &= 20 \times 12 + 10 \times 10.8 + 15 \times 7 + 15 \times 5 + 72 \\ &= \underline{600}\end{aligned}$$

$$\text{PERCENTAGE} > 1 \text{ HOUR} = \frac{72}{600} \times 100 = \underline{12\%}$$



Answer 3

The histogram shows information about the times taken by some students to finish a puzzle.



(a) Complete the frequency table for this information.

HISTOGRAMS
"FREQUENCY IS AREA"
 $FREQ = CW \times FD$
 $\rightarrow FD = \frac{FREQ}{CW}$

Time taken (t minutes)	CW	FD	Frequency
$0 < t \leq 5$	5	0.8	4 ✓
$5 < t \leq 15$	10	0.4	4
$15 < t \leq 25$	10	0.6	6
$25 < t \leq 30$	5	1	5
$30 < t \leq 50$	20	0.2	4

TOTAL 23



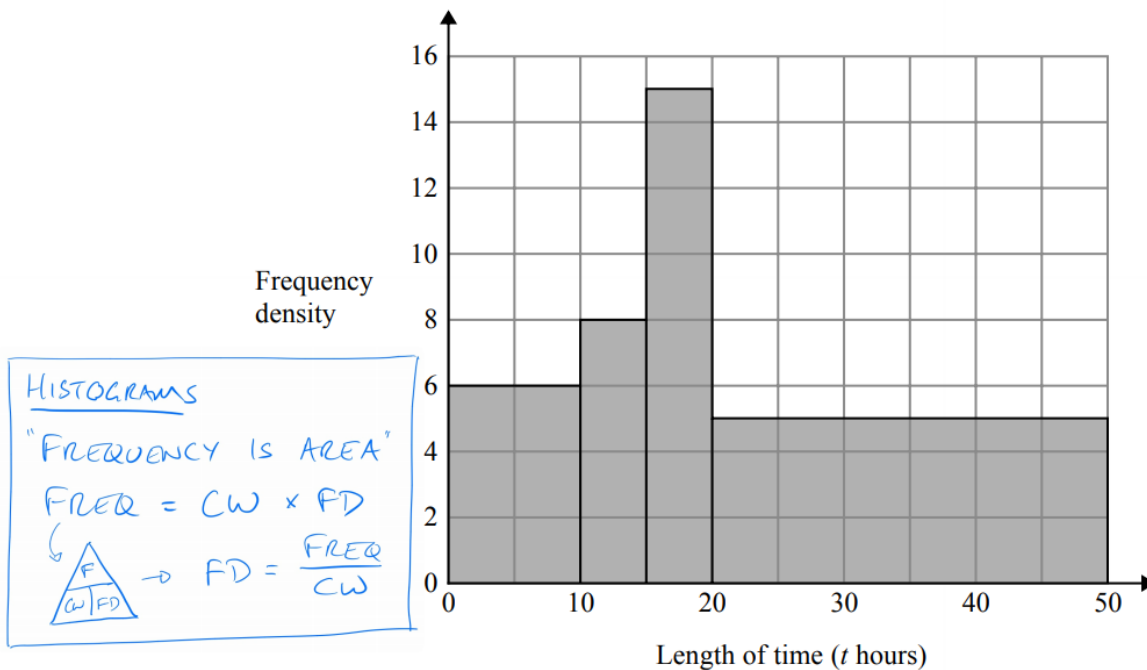
Answer 4

Bhavna recorded the lengths of time, in hours, that some adults watched TV last week.

The table shows information about her results.

Length of time (t hours)	Frequency
$0 \leq t < 10$	6
$10 \leq t < 15$	8
$15 \leq t < 20$	15
$20 \leq t < 40$	5

Bhavna made some mistakes when she drew a histogram for this information.



Write down **two** mistakes Bhavna made.

- USED FREQUENCY INSTEAD OF FREQ. DENSITY
- RIGHT HAND BAR GOES TO 50, NOT 40.



Answer 5

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

Key Points

1. FREQUENCY IS AREA

so FREQUENCY = FD × CW

2. Blue Triangle may help:

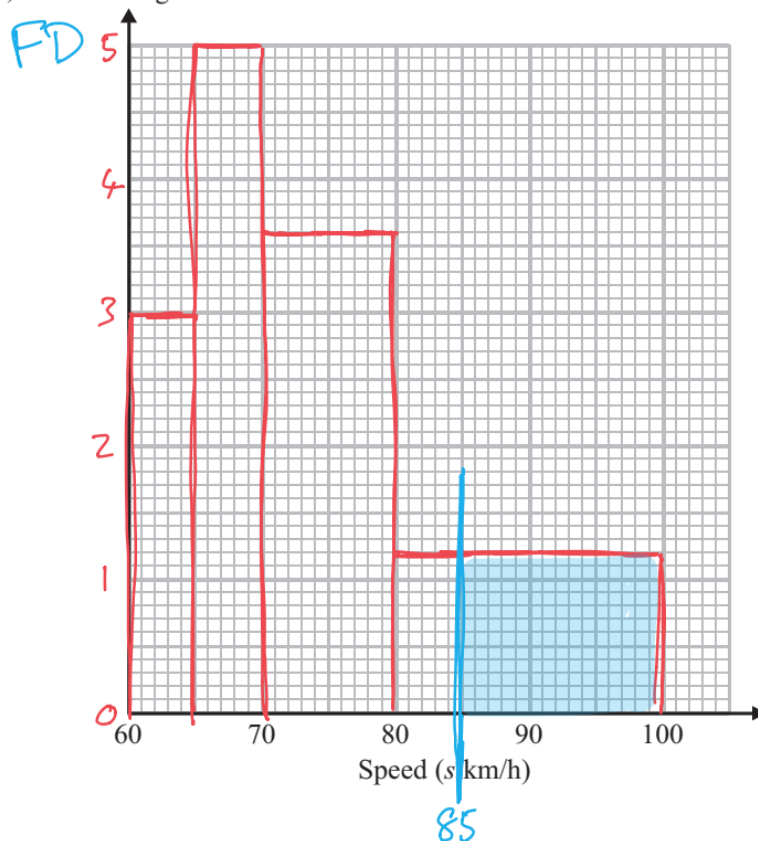


3. Appropriate SCALE on FD axis

4. Add EXTRA COLUMNS to table

Speed (s km/h)	Frequency	CW	FD
$60 < s \leq 65$	15	5	3
$65 < s \leq 70$	25	5	5
$70 < s \leq 80$	36	10	3.6
$80 < s \leq 100$	24	20	1.2

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

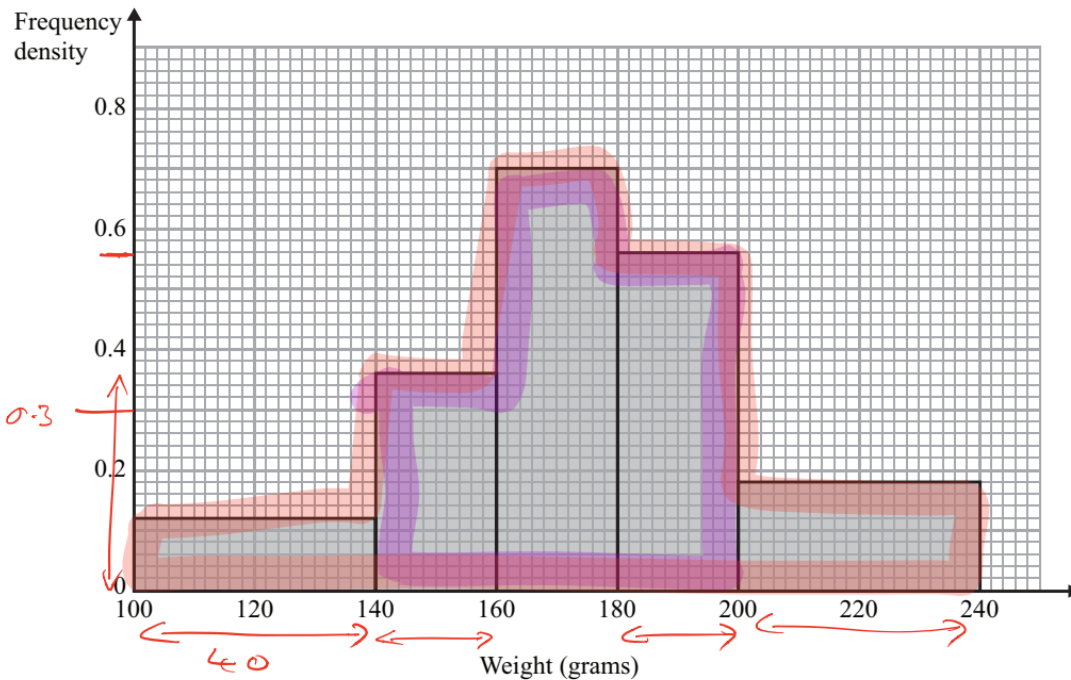




Answer 6

HISTOGRAM: FREQUENCY IS AREA

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.

FRACTION

$$\begin{aligned} \text{PROPORTION} &= \frac{\quad}{\quad} \\ &= \frac{20 \times 0.36 + 20 \times 0.7 + 20 \times 0.56}{20 \times 0.36 + 20 \times 0.7 + 20 \times 0.56 + 40 \times 0.12 + 40 \times 0.18} \\ &= \underline{0.73} \quad \left(73\% \text{ or } \frac{27}{37} \right) \end{aligned}$$



Answer 7

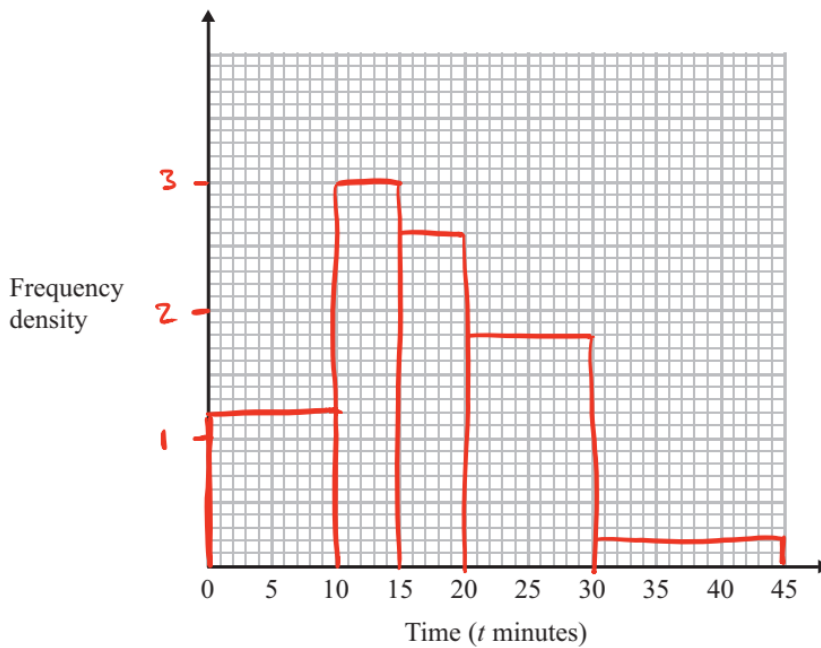
Bill works for a computer service centre.

The table shows some information about the length of time, t minutes, of the phone calls Bill had.

Time (t minutes)	$0 < t \leq 10$	<u>$10 < t \leq 15$</u>	$15 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 45$
Number of calls	12	15	13	18	3
CW	10	5	5	10	15
FD	= 1.2	= 3	= 2.6	1.8	0.2

$$\frac{3}{15} = \frac{3}{3 \times 5} = \frac{1}{5}$$

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



HISTOGRAM
FREQUENCY IS AREA
 $FREQ = CW \times FD$

$$\rightarrow FD = \frac{FREQ}{CW}$$



Answer 8

- (b) Work out the proportion of people in the sample who have a salary greater than £40 000

$$\frac{8}{43} \text{ PEOPLE HAVE A SALARY } > \text{£}0000$$

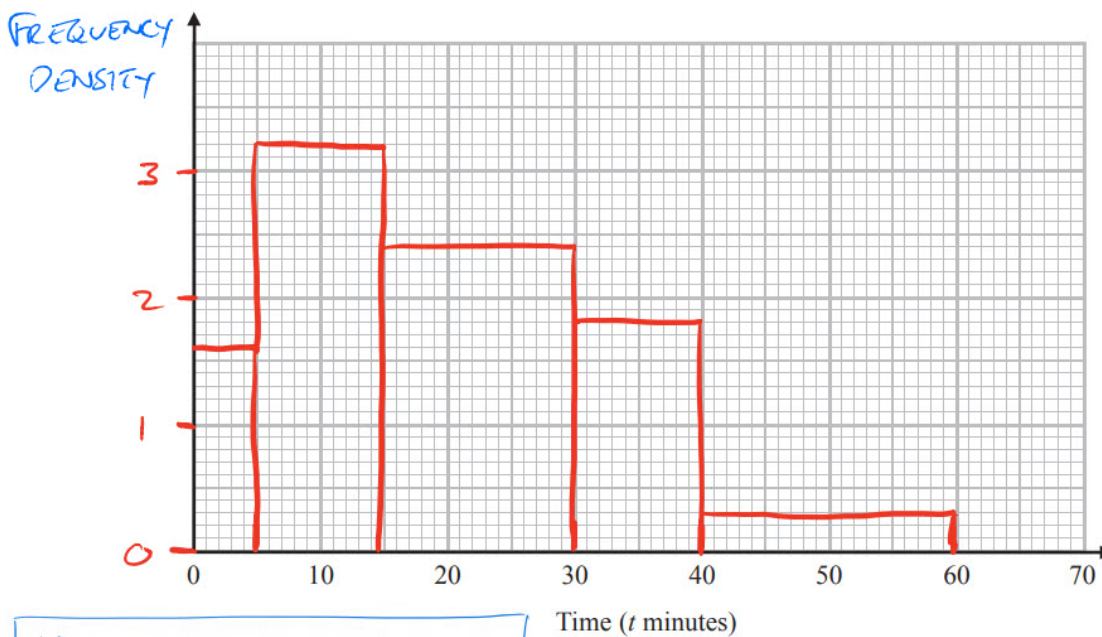


Answer 9

The table gives information about the lengths of time some people were in a supermarket.

Time (t minutes)	Frequency	CLASS WIDTH	FREQUENCY DENSITY
$0 < t \leq 5$	8	5	1.6
$5 < t \leq 15$	32	10	3.2
$15 < t \leq 30$	36	15	2.4
$30 < t \leq 40$	18	10	1.8
$40 < t \leq 60$	6	20	0.3

Draw a histogram for the information in the table.



HISTOGRAMS

"FREQUENCY IS AREA"

$$\text{FREQ} = \text{CW} \times \text{FD}$$

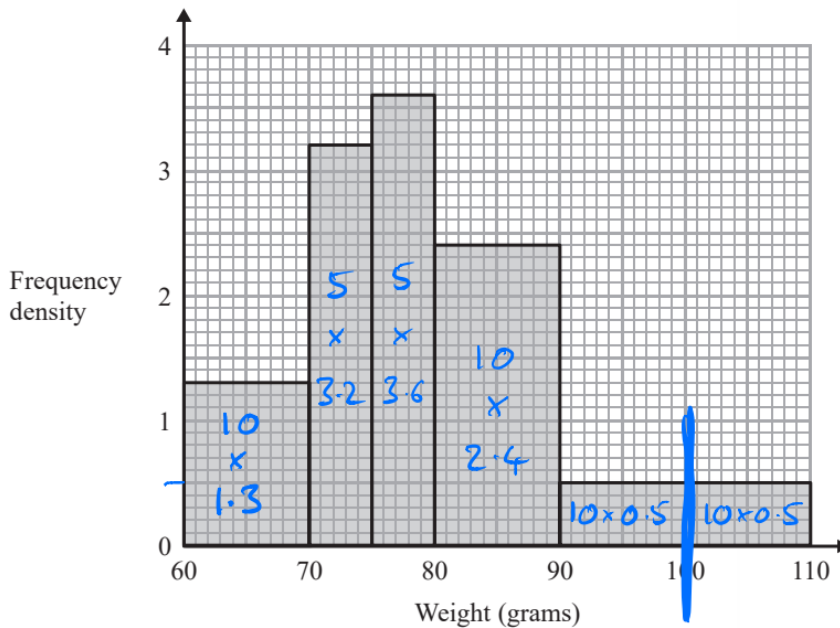
↙

$$\text{FD} = \frac{\text{FREQ}}{\text{CW}}$$



Answer 10

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.

$$\begin{aligned} \text{Plums} < 100\text{g} &= 10 \times 1.3 + 5 \times 3.2 + 5 \times 3.6 \\ &\quad + 10 \times 2.4 + 10 \times 0.5 \\ &= 76 \end{aligned}$$

$$\begin{aligned} \text{Total Plums} &= 76 + 10 \times 0.5 \\ &= 81 \end{aligned}$$

$$\text{Proportion} = \frac{76}{81}$$

HISTOGRAMS
"FREQUENCY IS AREA"
 $\text{FREQ} = \text{CW} \times \text{FD}$
 $\text{FD} = \frac{\text{FREQ}}{\text{CW}}$



Answer 11

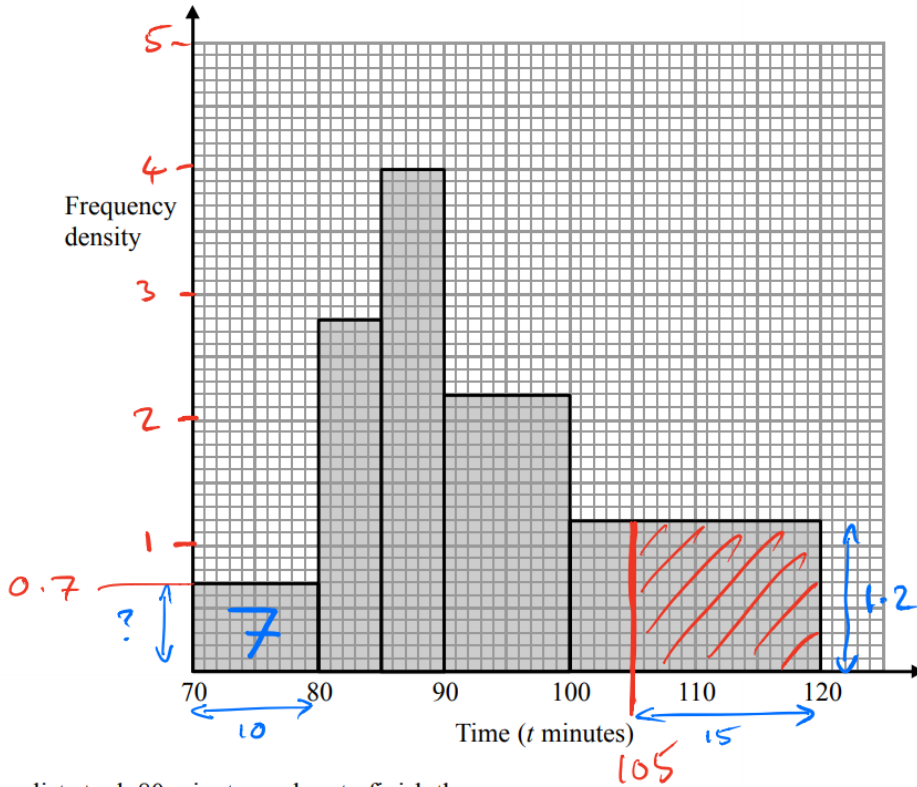
- (b) Work out an estimate for the fraction of the students who have a height between 150 cm and 170 cm.

$$\text{FRACTION} = \frac{30+51+36+6}{150} = \frac{123}{150} = \frac{41}{50}$$



Answer 12

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.

NEED FD SCALE: $? \times \frac{10}{10} = \frac{7}{10}$
 $? = 0.7$

NO OF CYCLISTS > 105 MINS = 15×1.2
 $= 18$

HISTOGRAMS

"FREQUENCY IS AREA"

FREQ = CW × FD

$\triangle \begin{matrix} F \\ \hline CW \mid FD \end{matrix} \rightarrow FD = \frac{FREQ}{CW}$

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

WE ARE ASSUMING THAT CYCLISTS IN THE 100 → 120 MIN INTERVAL ARE EVENLY SPREAD OUT

$15 \times 10 = 150$
 $15 \times 2 = 30$

 $15 \times 12 = 180$



Answer 13

(b) Find an estimate for the median. MIDDLE VALUE

41ST CAR IS MEDIAN SPEED.

$$\left. \begin{array}{l} 13+16 = 29 \\ 13+16+18 = 47 \end{array} \right\} 41^{\text{ST}} \text{ CAR} = \frac{12}{18} \text{ OF WAY INTO } 105 \rightarrow 110$$

$$\text{MED} = 105 + \frac{12}{18} \times 5 = \underline{\underline{109}}$$

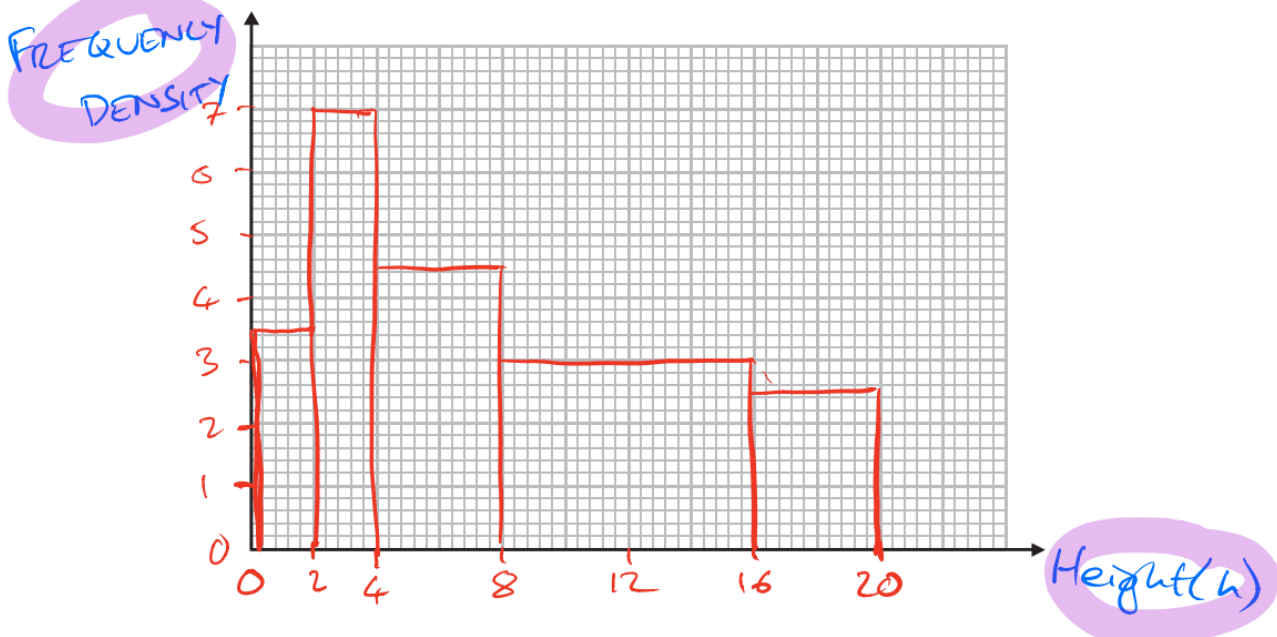


Answer 14

The table gives information about the heights, h metres, of trees in a wood.

Height (h metres)	Frequency	CW	FD
$0 < h \leq 2$	7	2	3.5
$2 < h \leq 4$	14	2	7
$4 < h \leq 8$	18	4	4.5
$8 < h \leq 16$	24	8	3
$16 < h \leq 20$	10	4	2.5

Draw a histogram to show this information.



HISTOGRAM:

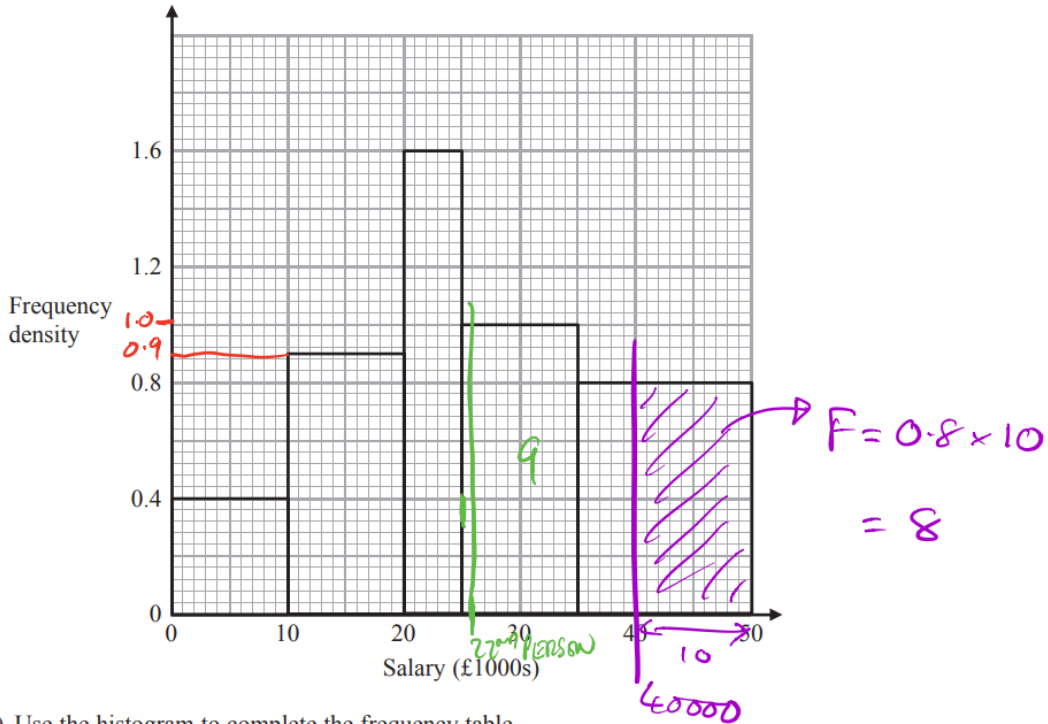
FREQUENCY IS AREA

$$\text{FREQ} = \text{CW} \times \text{FD}$$
$$\text{FD} = \frac{\text{FREQ}}{\text{CW}}$$



Answer 15

The histogram shows some information about the salaries of a sample of people.



(a) Use the histogram to complete the frequency table.

FD	CW	Salary (p) in £1000s	Frequency
0.4×10		$0 < p \leq 10$	$= 4$ ✓
0.9×10		$10 < p \leq 20$	$= 9$
1.6×5		$20 < p \leq 25$	$= 8$
1.0×10		$25 < p \leq 35$	$= 10$ 9
0.8×15		$35 < p \leq 50$	$= 12$ 12

Handwritten notes: } 21 (for 10 < p ≤ 20 and 20 < p ≤ 25), } 21 (for 25 < p ≤ 35 and 35 < p ≤ 50), 27.9 person (near 25 < p ≤ 35), 40000 (near 35 < p ≤ 50).

TOTAL 43

HISTOGRAMS

"FREQUENCY IS AREA"

$FREQ = CW \times FD$

$\rightarrow FD = \frac{FREQ}{CW}$