

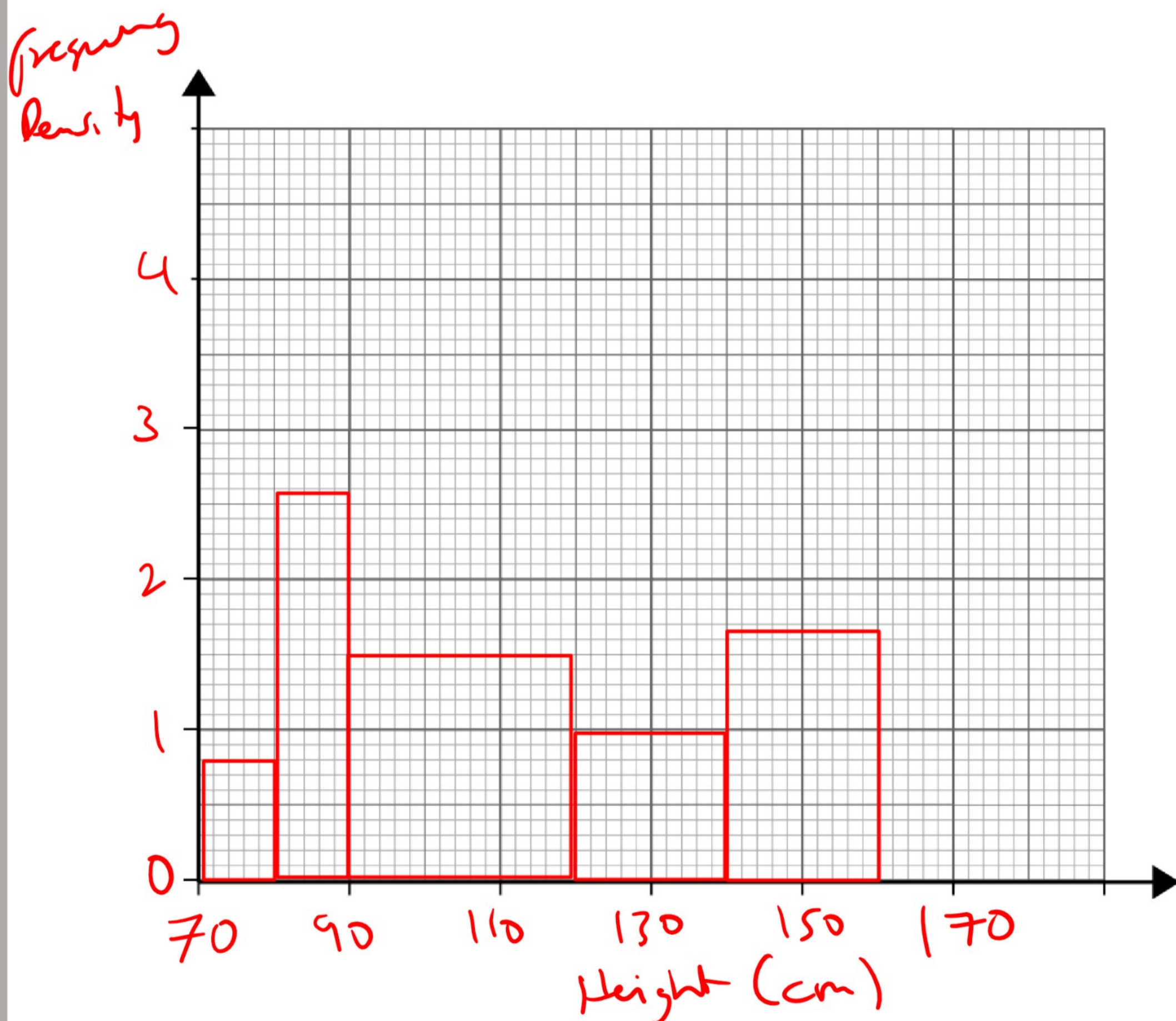


Histograms Exam Practice

Q1. The table below shows the height of some plants measured in cm.

Height of plant	Frequency	Frequency Density
$70 \leq h < 80$ (10)	8	$(8 \div 10) = 0.8$
$80 \leq h < 90$	27	2.7
$90 \leq h < 120$	45	1.5
$120 \leq h < 140$	20	1
$140 \leq h < 160$	12	1.6

Draw a histogram on the grid below



Answer: _____

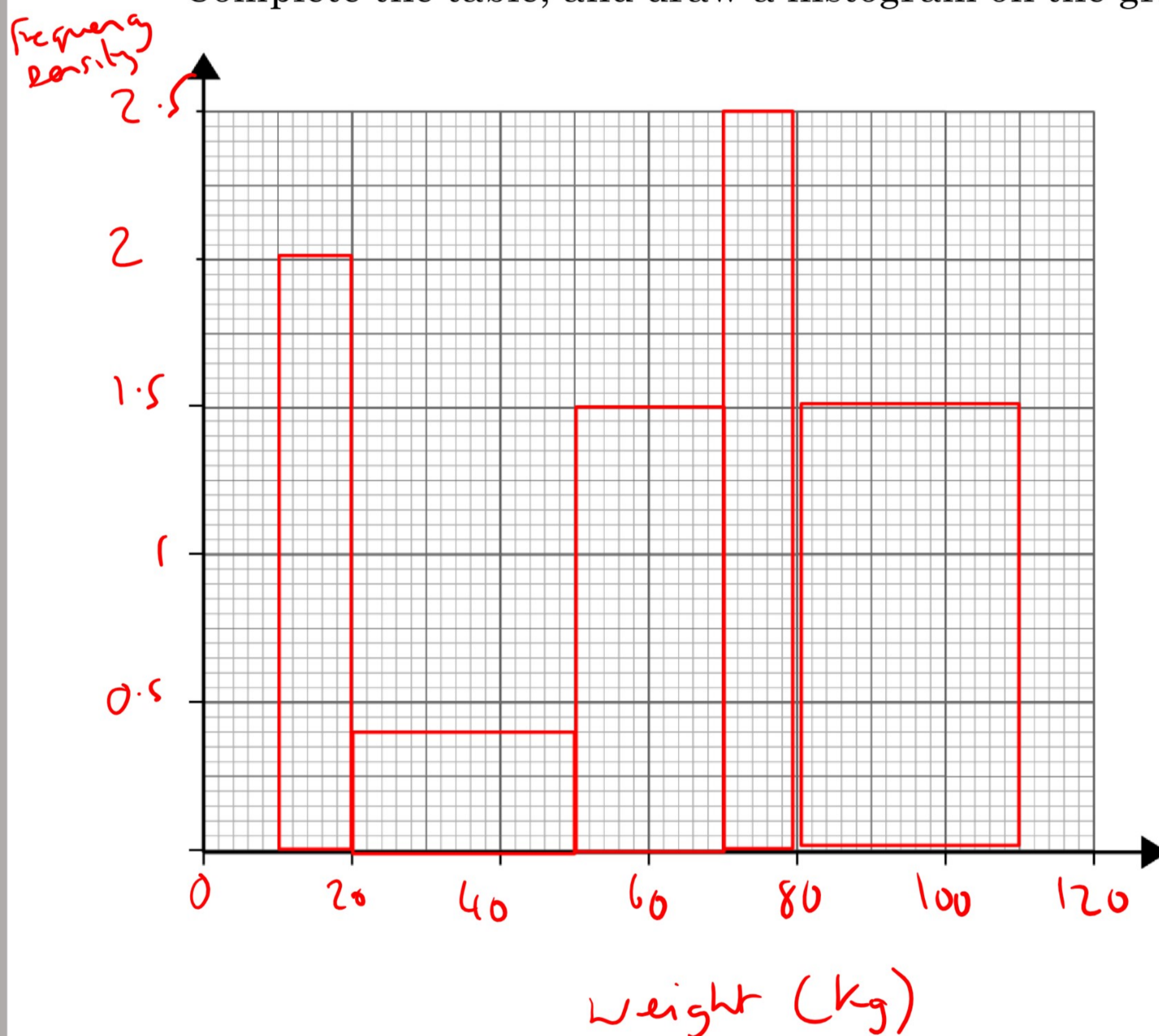
(3 marks)



Q2. The table below shows the weight of some dogs measured in kg.

Weight of a dog (Kg)	Frequency	Frequency Density
$10 \leq w < 20$	40	2.0
$20 \leq w < 50$	12	0.4
$50 \leq w < 70$	30	1.5
$70 \leq w < 80$	25	2.5
$80 \leq w < 110$	20	1.5

Complete the table, and draw a histogram on the grid below.

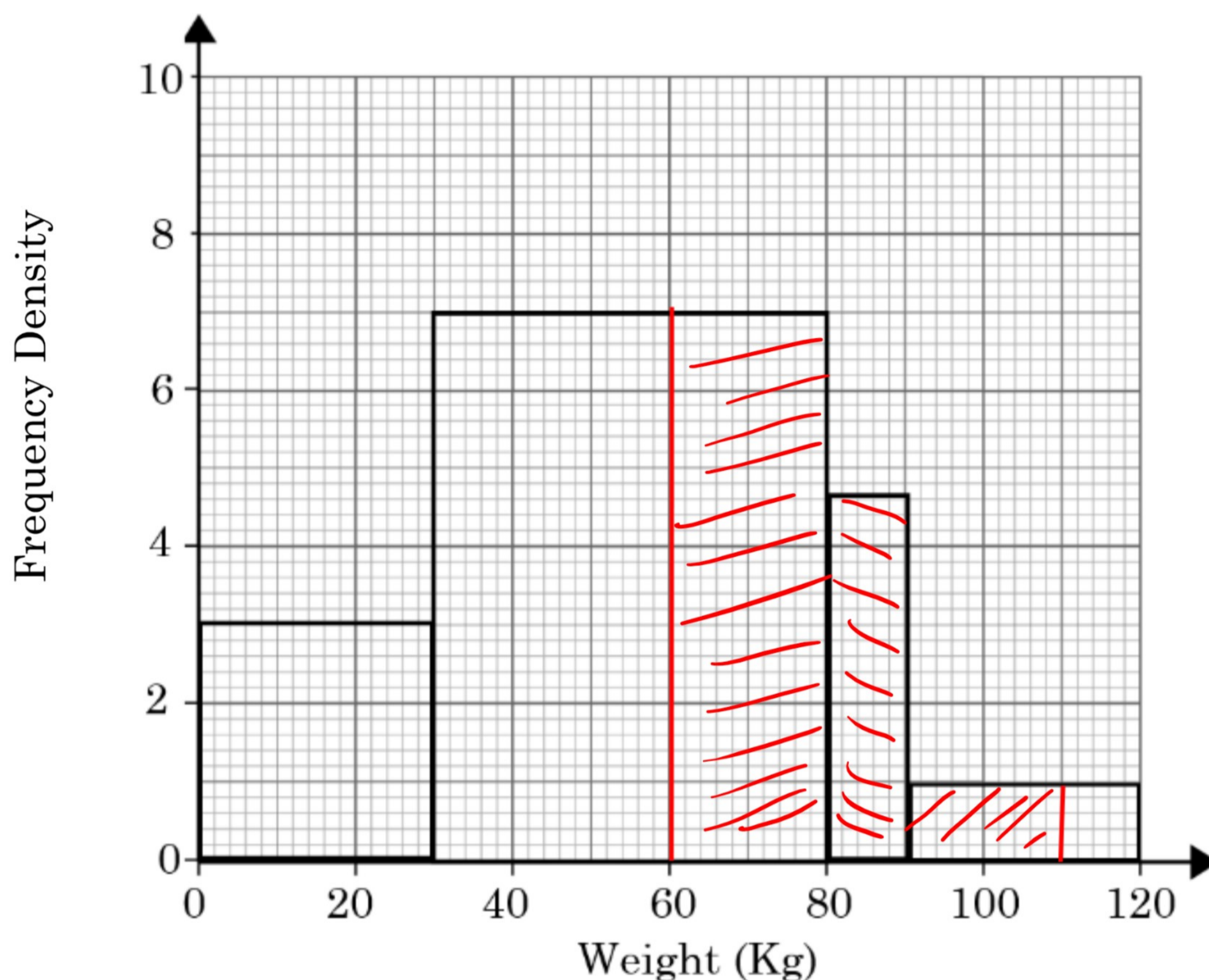


Answer: _____

(3 marks)



Q3. The histogram below shows the distribution of the weights of some animals in a zoo.



a) Work out an estimate for the number of animals which weigh between 60 kg and 110 kg

$$\begin{aligned} & 20 \times 7 + 10 \times 4.6 + 20 \times 1 \\ &= 140 + 46 + 20 \\ &= 206 \end{aligned}$$

Answer: 206
(2 marks)

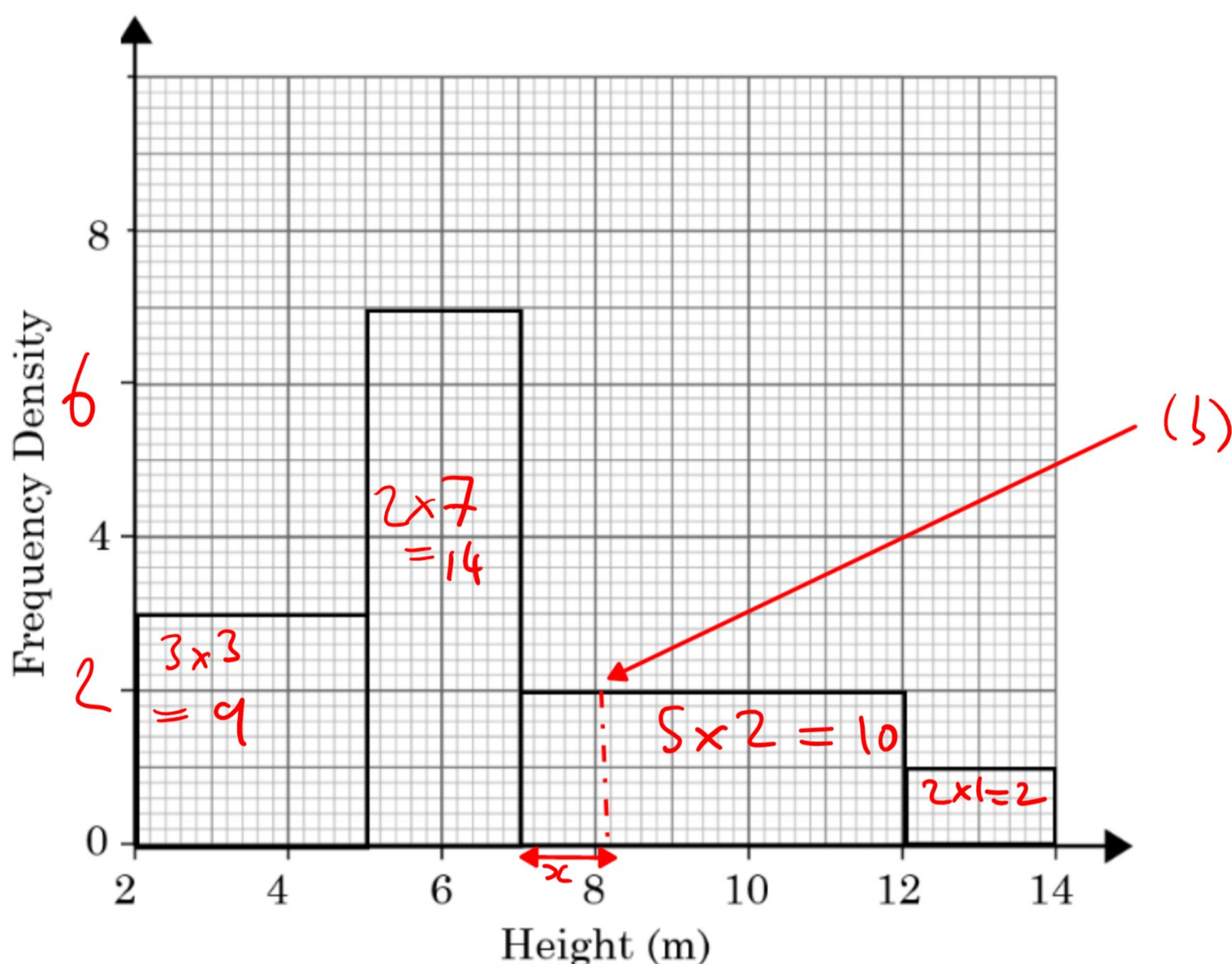
b) Explain why your answers above are only estimates.

The data is grouped.

Answer: _____
(1 mark)



Q4. The histogram shows the distribution of the heights of trees in Abbey forest.



a) Work out an estimate for the mean height of a tree

height (x)	frequency (f)	$f \times x_{mid}$
2-5	9	$9 \times 3.5 = 31.5$
5-7	14	$14 \times 6 = 84$
7-12	10	$10 \times 9.5 = 95$
12-14	2	$2 \times 13 = 26$
Totals	35	

$$\text{mean} \approx \frac{276.5}{35} = 6.756 \dots$$

Answer: 6.76 m
(3 marks)

b) Work out an estimate for the interquartile range

$$\begin{aligned} LQ &= \frac{1}{4} \times 35 = 8.75^{\text{th}} \text{ data value}, \quad UQ = \frac{3}{4} \times 35 = 26.25 \text{ data value} \\ \Rightarrow LQ \times 3 &= 8.75; \quad x \times 2 = (26.25 - 23) \Rightarrow x = 1.625 \\ \Rightarrow LQ &= 2.916 \dots; \quad \Rightarrow UQ = 23 + 1.625 \\ &= 24.625 \end{aligned}$$

Answer: 24.625 - 2.916 = 21.7
(4 marks)

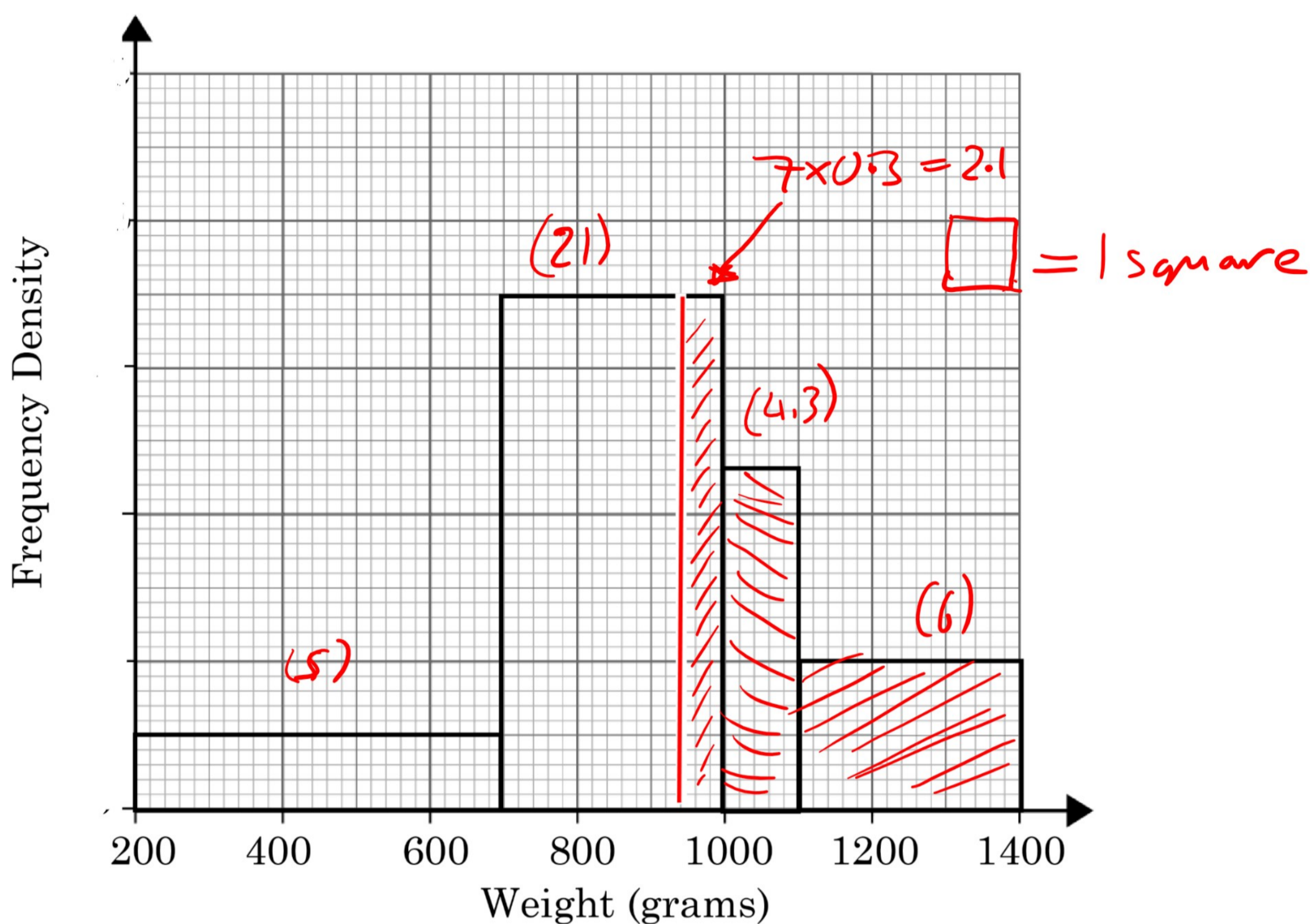
c) The interquartile range in Broadley woods is 20.3. Compare on the distribution of the trees in each wood.

The trees in Abbey wood are generally taller than those in Broadley woods.

Answer: _____
(1 mark)



Q5. The histogram shows the distribution of pineapples in a food warehouse.



Work out an estimate for the proportion of pineapples which weigh more than 0.940 kg

$$\text{proportion} = \frac{\text{shaded area}}{\text{total area}}$$

$$\begin{aligned} \text{shaded squares} &= \frac{2.1 + 4.3 + 6}{5 + 21 + 4.3 + 6} \\ &= \frac{12.4}{36.3} \end{aligned}$$

$$= \frac{124}{363}$$

Answer: $\frac{124}{363}$

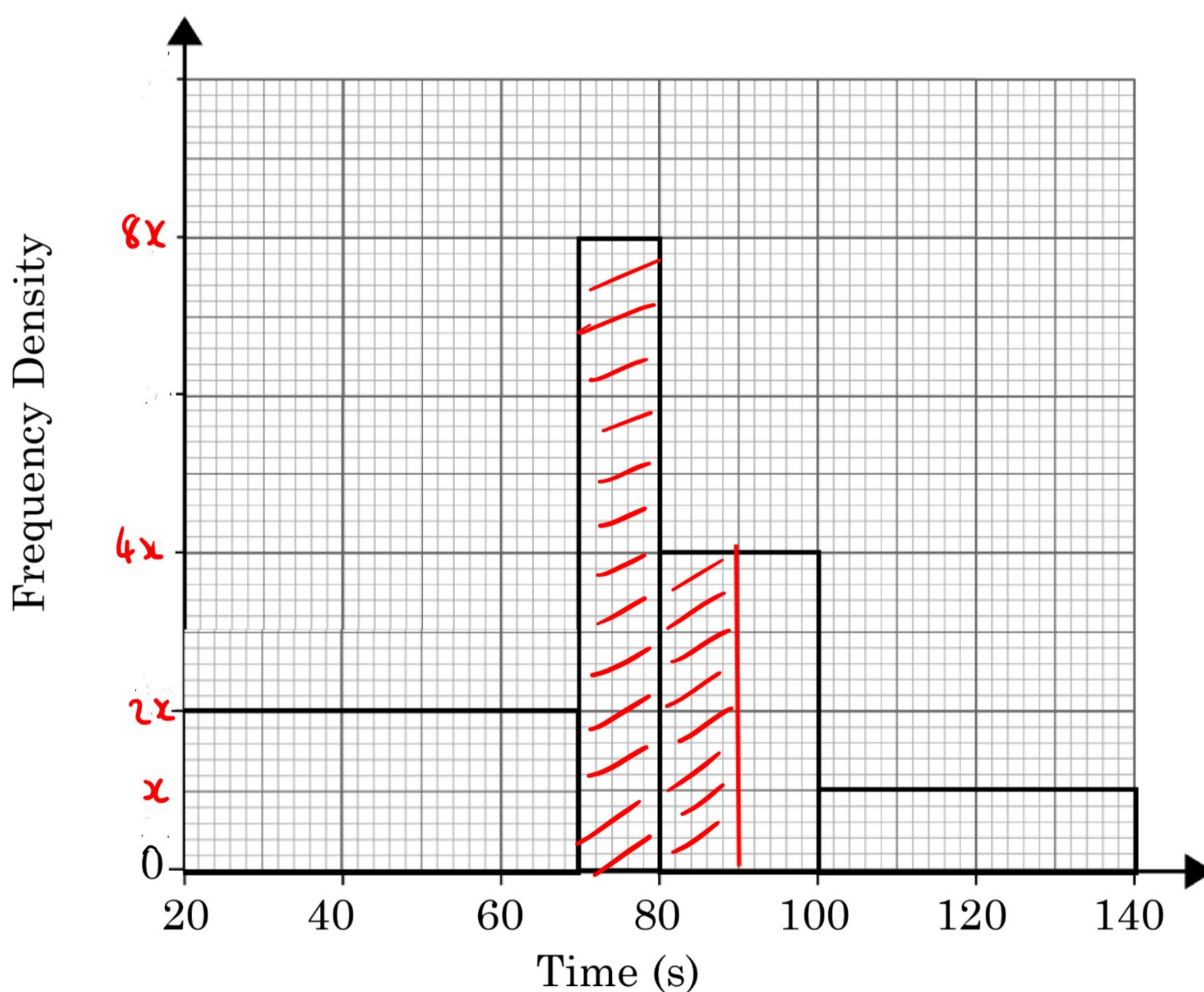
(3 marks)



Q6. An educational psychologist investigated the time taken by some pupils to complete a word puzzle.

The results showed that 30 students took between 70 and 90 seconds. Use this information to complete both the table and the histogram on the grid below.

Time taken	Frequency	Frequency Density
$20 \leq s < 70$	$50 \times 0.5 = 25$	$2x$ (0.5)
$70 \leq s < 80$	$10 \times 2 = 20$	$8x$ (2)
$80 \leq s < 100$	$20 \times 1 = 20$	$4x$ (1)
$100 \leq s < 140$	$40 \times 0.25 = 10$	x (0.25)



$$10 \times 8x + 10 \times 4x = 30 \text{ students}$$
$$120x = 30$$
$$\Rightarrow x = 0.25$$

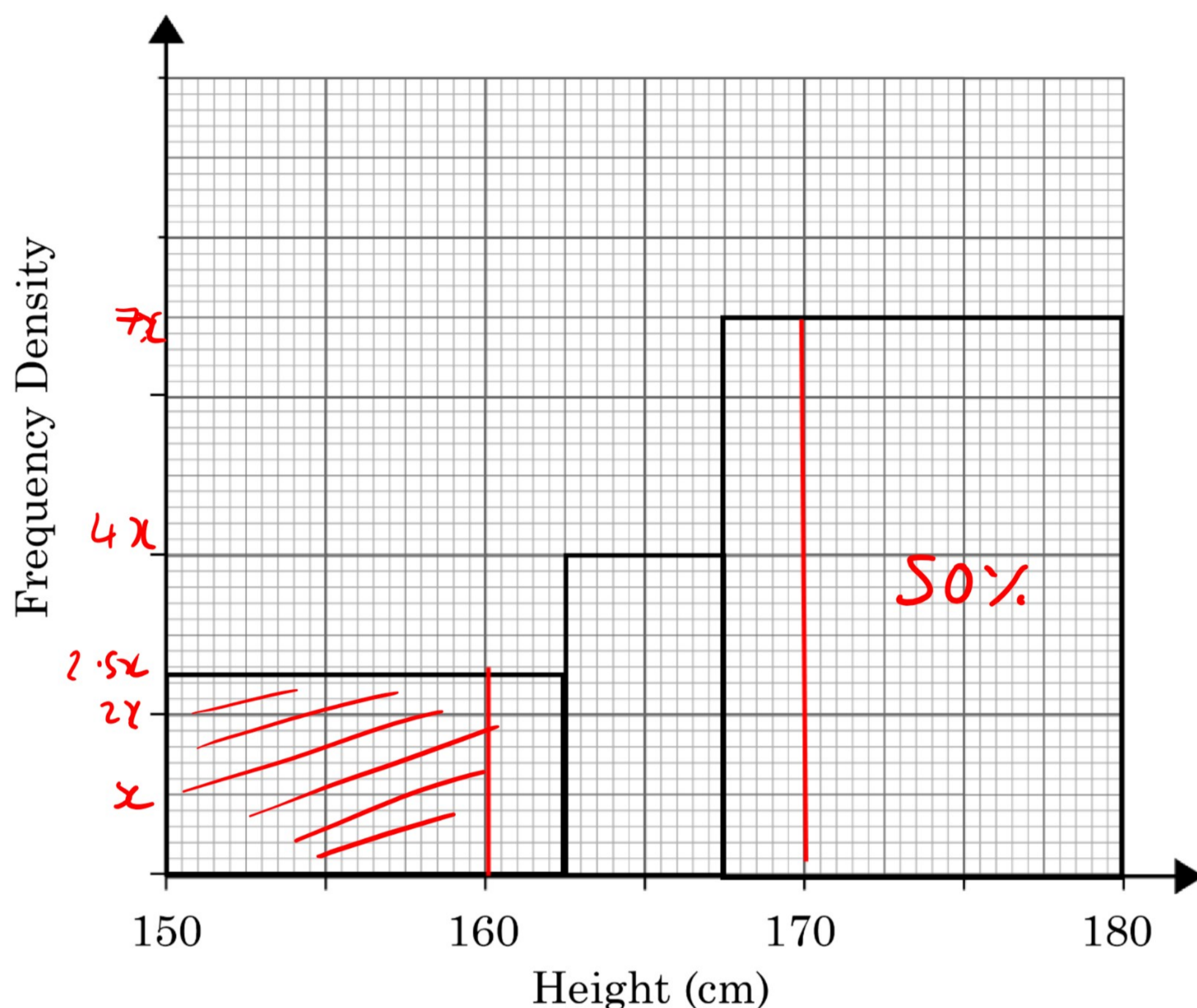
Answer: _____

(4 marks)



Q7. In Colebridge, the height of every adult female is recorded.

The median height of a woman in Colebridge is 170 cm, where the population of adult women is 560.



Estimate the number of women who are taller than 160 cm.

• 50% of the histogram is up to 170 cm, rest is above.

$$10 \times 7x = \frac{560}{2}$$

$$\Rightarrow 70x = 280$$

$$\Rightarrow x = 4$$

• no. of women > 160 cm = $560 - \text{no. of women} \leq 160$ cm

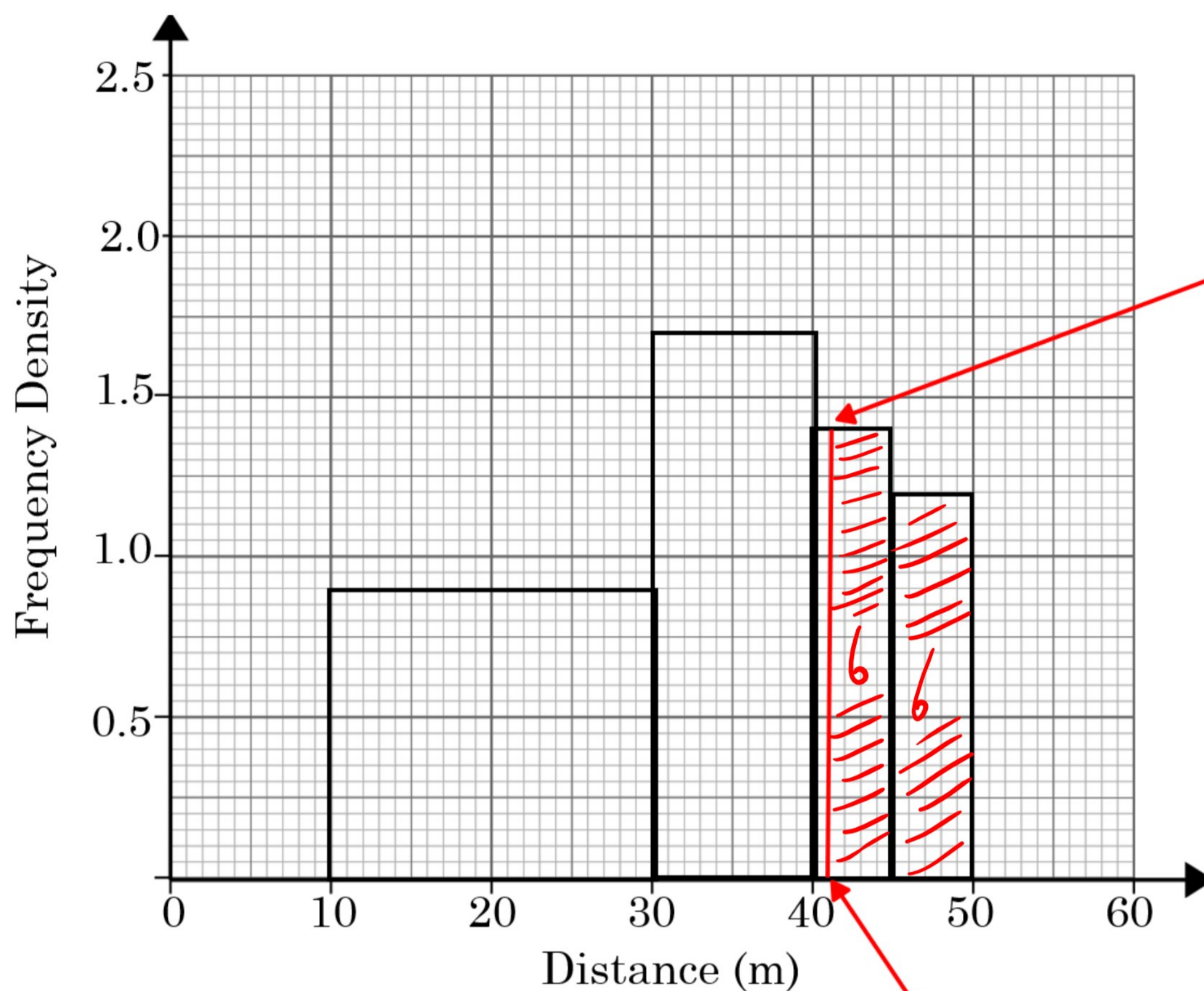
$$\begin{aligned} \Rightarrow 560 - 2.5 \times 4 \times 10 \\ = 560 - 100 \end{aligned}$$

Answer: 460

(4 marks)



Q8. 48 athletes took part in a discus competition, and the distances they managed to throw the discus are shown by the histogram below:



(b) need 12 athletes in the shaded boxes

a) Complete the frequency table below

Distance thrown (m)	Frequency
$10 \leq d < 30$	$20 \times 0.9 = 18$
$30 \leq d < 35$	$10 \times 1.7 = 17$
$35 \leq d < 40$	$5 \times 1.4 = 7$
$40 \leq d < 45$	$5 \times 1.2 = 6$

Answer: _____

(3 marks)

b) 15% of the athletes threw the discus further than d metres. Calculate an estimate of d .

• 25% of 48 = 12 athletes. Looking at the histogram, we find d so that

• $(45 - d) \times 1.4 = 6$

$\Rightarrow 45 - d = \frac{30}{7}$, $d = 45 - \frac{30}{7}$

Answer: $d = 40.71\text{m}$

(3 marks)