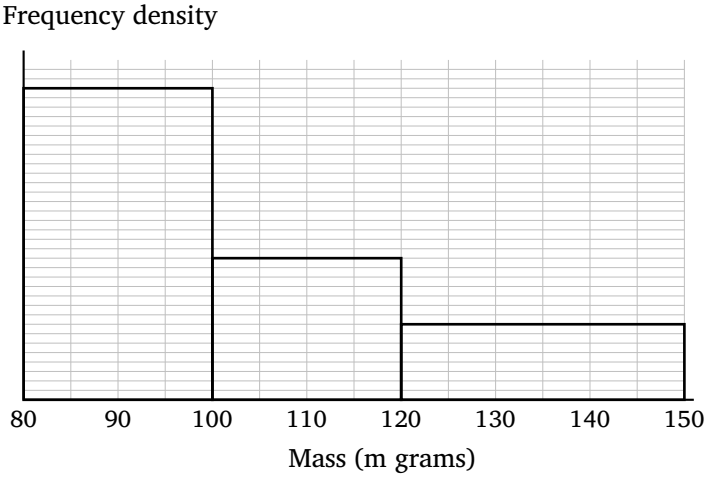
Histogram Interpretation

Practice Worksheet (June 2027 Paper 1H Style)

I Do

The histogram shows the masses of 120 apples. The vertical scale is not labelled. The bar for $100 < m \leq 120$ represents 30 apples. Work out the number of apples with a mass greater than 120 grams.

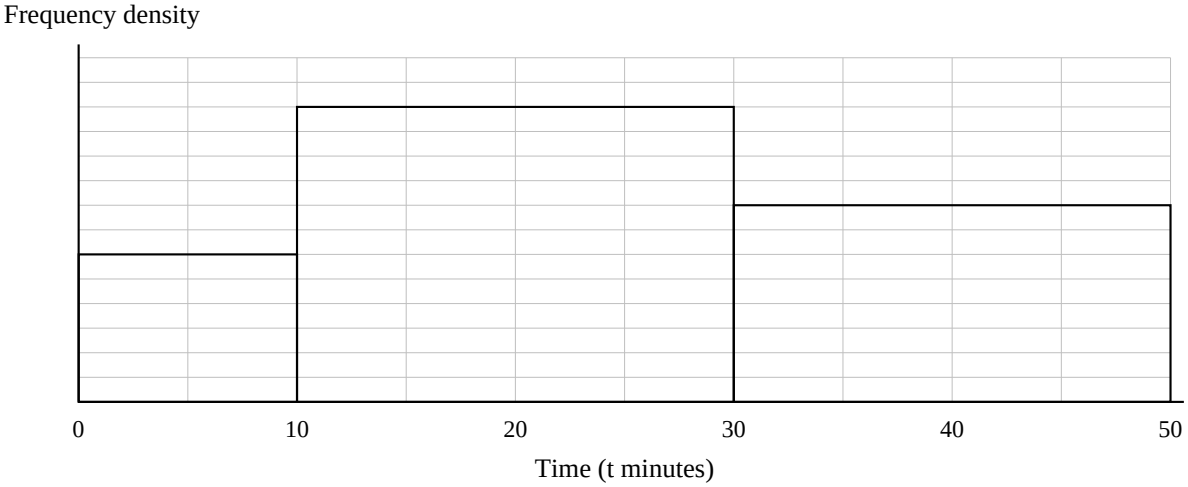


Video walkthrough

(Total for Question is 3 marks)

We Do

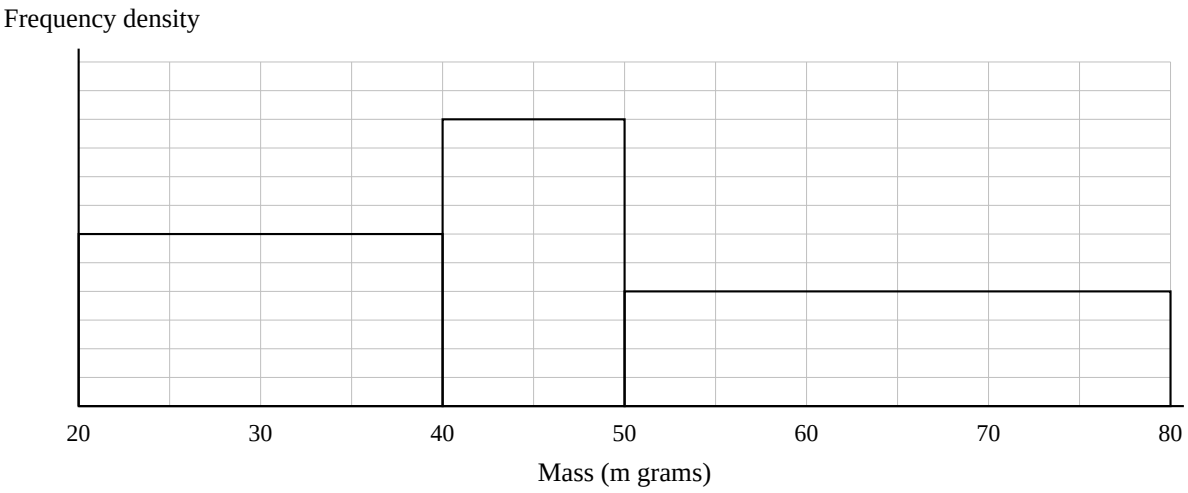
The histogram shows the times of 92 journeys. The vertical scale is not labelled. The bar for $10 < t \leq 30$ represents 48 journeys. Work out the number with $t > 30$ minutes.



(Total for Question is 3 marks)

You Do 1

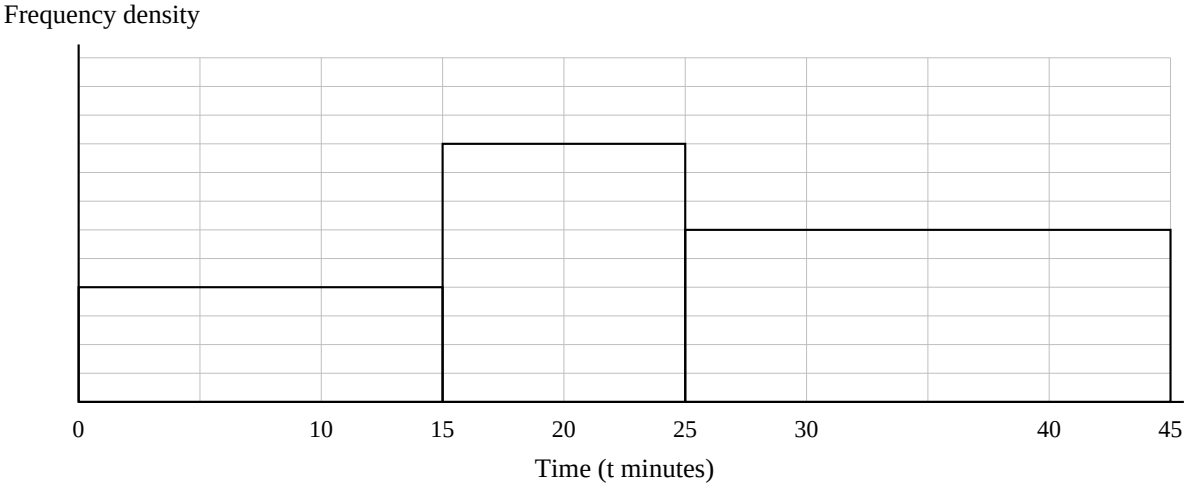
The histogram shows the masses of 85 stones. The vertical scale is not labelled. The bar for $40 < m \leq 50$ represents 25 stones. Work out the number with $m > 50$ grams.



(Total for Question is 3 marks)

You Do 2

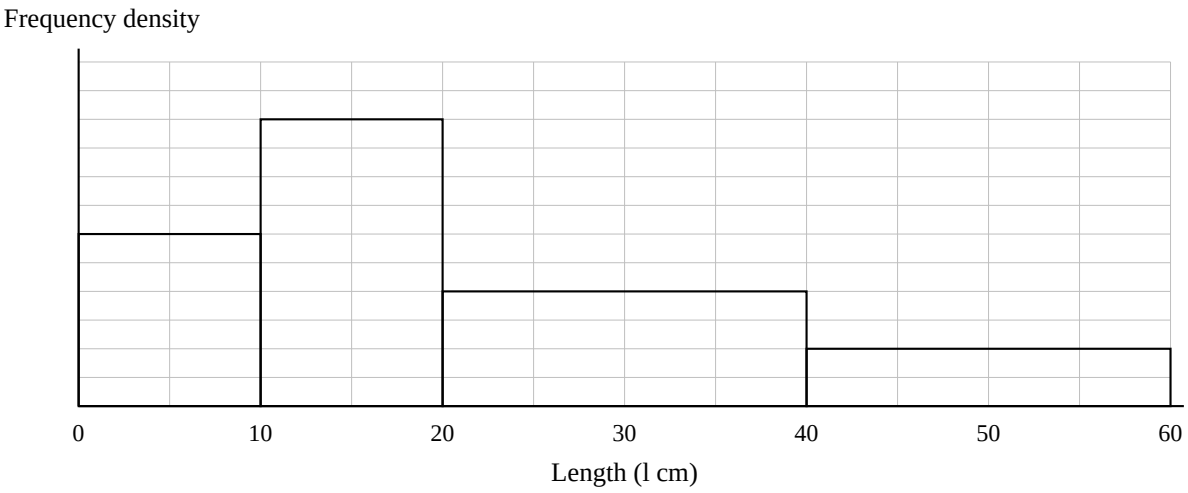
The histogram shows 54 waiting times, measured in minutes. The vertical scale is not labelled. The bar for $15 < t \leq 25$ represents 18 waiting times. Work out the number with $t \leq 15$ minutes.



(Total for Question is 3 marks)

You Do 3

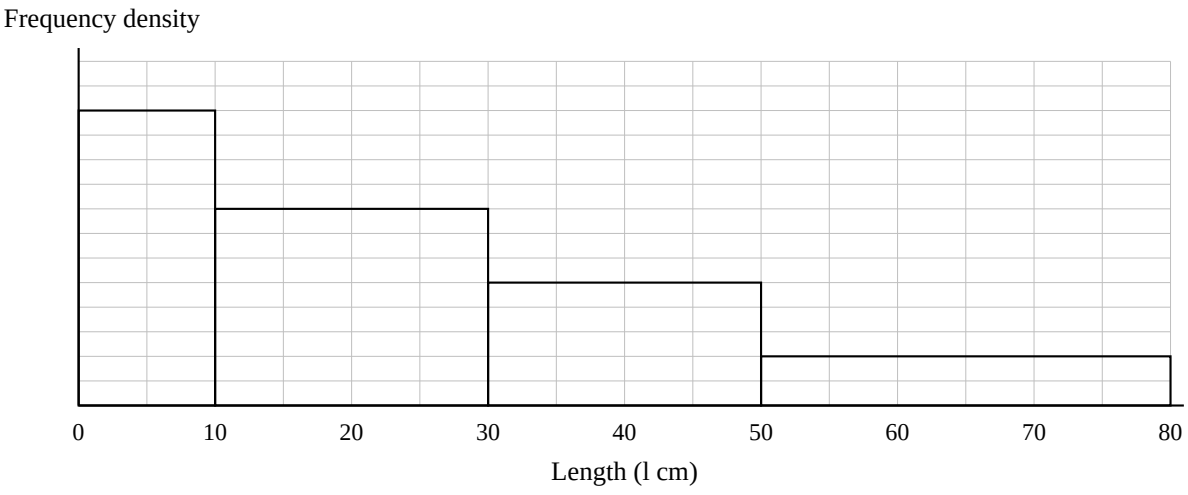
The histogram shows the lengths of 70 leaves. The vertical scale is not labelled. The bar for $10 < l \leq 20$ represents 25 leaves. Work out the number with $l > 20$ cm.



(Total for Question is 4 marks)

Challenge 1

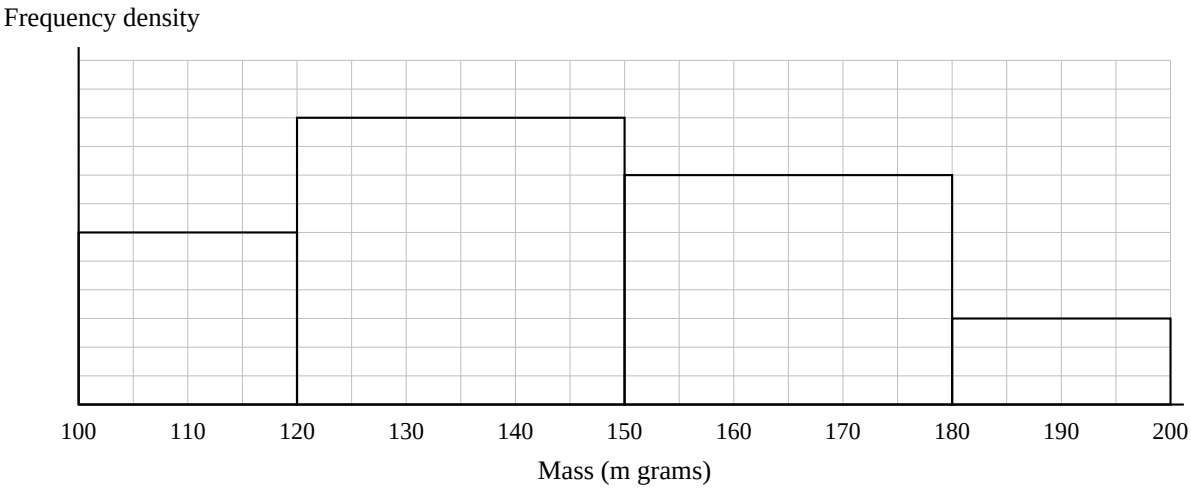
The histogram shows the lengths of 110 rods. The vertical scale is not labelled. The bar for $10 < l \leq 30$ represents 40 rods. Estimate the number with $25 < l \leq 60$. State an assumption.



(Total for Question is 4 marks)

Challenge 2

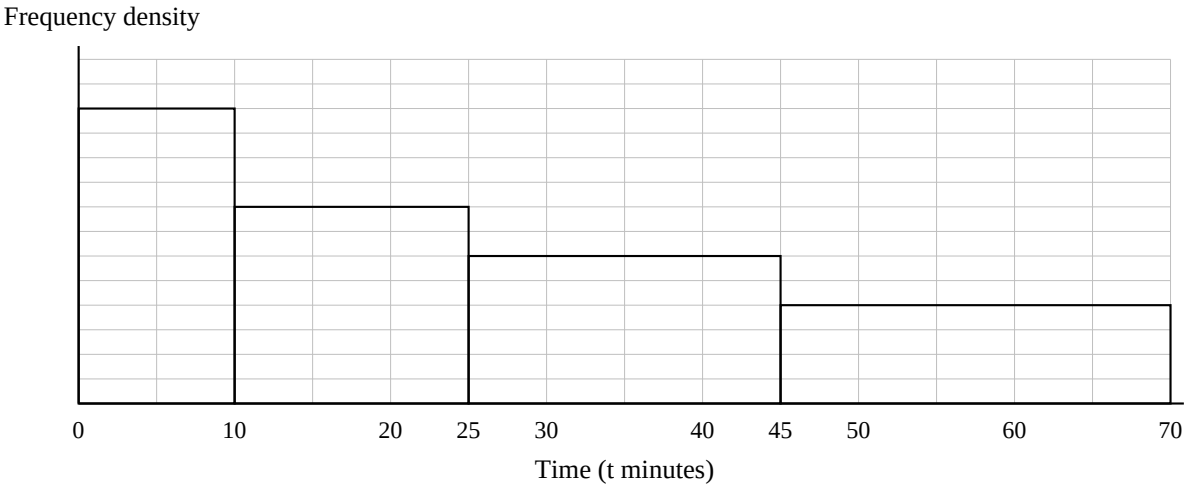
The histogram shows the masses of 180 peaches. The vertical scale is not labelled. The bar for $120 < m \leq 150$ represents 75 peaches. A peach is chosen at random. Estimate the probability that $140 < m \leq 180$. State an assumption.



(Total for Question is 4 marks)

Extreme Challenge

The histogram shows 115 journey times, measured in minutes. The vertical scale is not labelled. Estimate the upper quartile. State the assumption used in your estimate.



(Total for Question is 5 marks)

Answers & Worked Solutions

I Do

Frequency = class width × frequency density.

The known class has width 20, so its density is 30 ÷ 20 = 1.5.

Compare bar heights with the known bar to obtain densities: 1.5 × 33/15 = 3.3, 1.5 × 15/15 = 1.5, 1.5 × 8/15 = 0.8.

Multiplying each density by its class width gives frequencies 66, 30, 24 (total 120).

The required frequency is **24** apples.

We Do

Frequency = class width × frequency density.

The known class has width 20, so its density is 48 ÷ 20 = 2.4.

Compare bar heights with the known bar to obtain densities: 2.4 × 6/12 = 1.2, 2.4 × 12/12 = 2.4, 2.4 × 8/12 = 1.6.

Multiplying each density by its class width gives frequencies 12, 48, 32 (total 92).

The required frequency is **32** journeys.

You Do 1

Frequency = class width × frequency density.

The known class has width 10, so its density is 25 ÷ 10 = 2.5.

Compare bar heights with the known bar to obtain densities: 2.5 × 6/10 = 1.5, 2.5 × 10/10 = 2.5, 2.5 × 4/10 = 1.

Multiplying each density by its class width gives frequencies 30, 25, 30 (total 85).

The required frequency is **30** stones.

Answers & Worked Solutions

You Do 2

Frequency = class width × frequency density.

The known class has width 10, so its density is 18 ÷ 10 = 1.8.

Compare bar heights with the known bar to obtain densities: 1.8 × 4/9 = 0.8, 1.8 × 9/9 = 1.8, 1.8 × 6/9 = 1.2.

Multiplying each density by its class width gives frequencies 12, 18, 24 (total 54).

The required frequency is **12** waiting times.

You Do 3

Frequency = class width × frequency density.

The known class has width 10, so its density is 25 ÷ 10 = 2.5.

Compare bar heights with the known bar to obtain densities: 2.5 × 6/10 = 1.5, 2.5 × 10/10 = 2.5, 2.5 × 4/10 = 1, 2.5 × 2/10 = 0.5.

Multiplying each density by its class width gives frequencies 15, 25, 20, 10 (total 70).

The required frequency is **30** leaves.

Challenge 1

Frequency = class width × frequency density.

The known class has width 20, so its density is 40 ÷ 20 = 2.

Compare bar heights with the known bar to obtain densities: 2 × 12/8 = 3, 2 × 8/8 = 2, 2 × 5/8 = 1.25, 2 × 2/8 = 0.5.

Multiplying each density by its class width gives frequencies 30, 40, 25, 15 (total 110).

For $25 < l \leq 30$: (5 ÷ 20) × 40 = 10. For $30 < l \leq 50$: 25.

For $50 < l \leq 60$: (10 ÷ 30) × 15 = 5.

Estimated number = 10 + 25 + 5 = **40** rods.

Assume the data are uniformly distributed within each partially used class.

Answers & Worked Solutions

Challenge 2

Frequency = class width × frequency density.

The known class has width 30, so its density is 75 ÷ 30 = 2.5.

Compare bar heights with the known bar to obtain densities: 2.5 × 6/10 = 1.5, 2.5 × 10/10 = 2.5, 2.5 × 8/10 = 2, 2.5 × 3/10 = 0.75.

Multiplying each density by its class width gives frequencies 30, 75, 60, 15 (total 180).

For $140 < m \leq 150$: (10 ÷ 30) × 75 = 25. For $150 < m \leq 180$: 60.

Estimated favourable frequency = 25 + 60 = 85.

Estimated probability = 85 ÷ 180 = **17/36** (approximately 0.4722).

Assume the data are uniformly distributed within each partially used class.

Extreme Challenge

Frequency is proportional to bar area, not bar height.

Relative areas = 10 × 12, 15 × 8, 20 × 6, 25 × 4 = 120, 120, 120, 100.

Total relative area = 460. Each relative area unit represents 115 ÷ 460 = 0.25 journeys.

The class frequencies are 30, 30, 30 and 25; their sum is 115.

The upper-quartile position is 0.75 × 115 = 86.25.

Cumulative frequency before 25 minutes is 60, so interpolate in $25 < t \leq 45$:

Upper quartile = 25 + ((86.25 − 60) ÷ 30) × 20 = **42.5** minutes.

Assume the journey times are uniformly distributed within this class.