



eClassroom

GCSE Mathematics

Histograms

Questions

Pearson Edexcel GCSE & iGCSE Mathematics

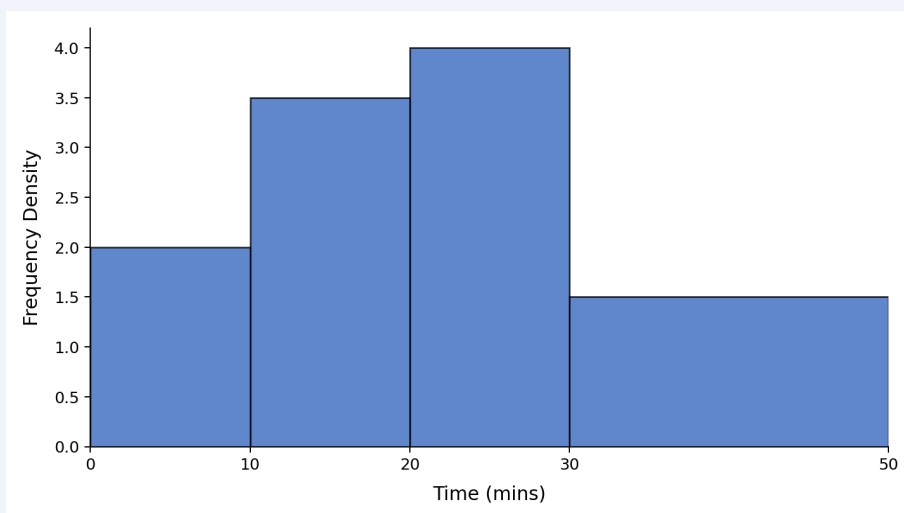


Section A — Foundation

Worked Examples

[Fluency]

Complete the table using the histogram.



Class	0–10	10–20	20–30	30–50
Class width	10	10	10	20
Freq. density	2.0	3.5	4.0	1.5
Frequency	20	35	40	30

Frequency = Frequency Density \times Class Width

[Reasoning]

Estimate the number of values between 15 and 25.

$$15-20 : 3.5 \times 5 = 17.5 \quad 20-25 : 4.0 \times 5 = 20 \quad \text{Total} \approx 37.5$$

[Problem Solving]

Why must the y-axis be labelled 'Frequency Density', not 'Frequency'?

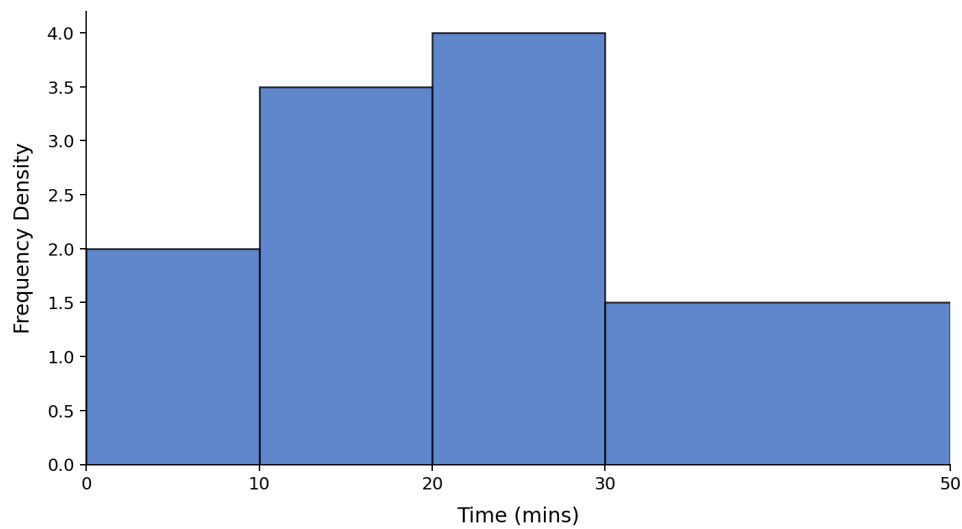
The bars have unequal widths. The **area** of each bar represents frequency, not the height.





[Fluency]

1.



Use the histogram to complete the table:

Class	0–10	10–20	20–30	30–50
Freq. density	2.0	3.5	4.0	1.5
Frequency				

(4 marks)

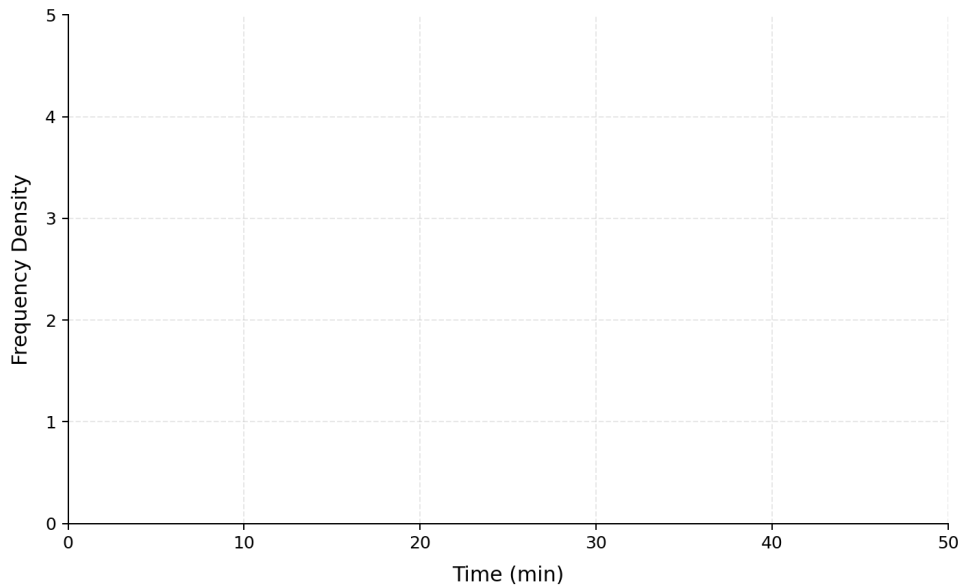


[Fluency]

2.

Time (min)	0–10	10–20	20–30	30–50
Frequency	20	35	40	30

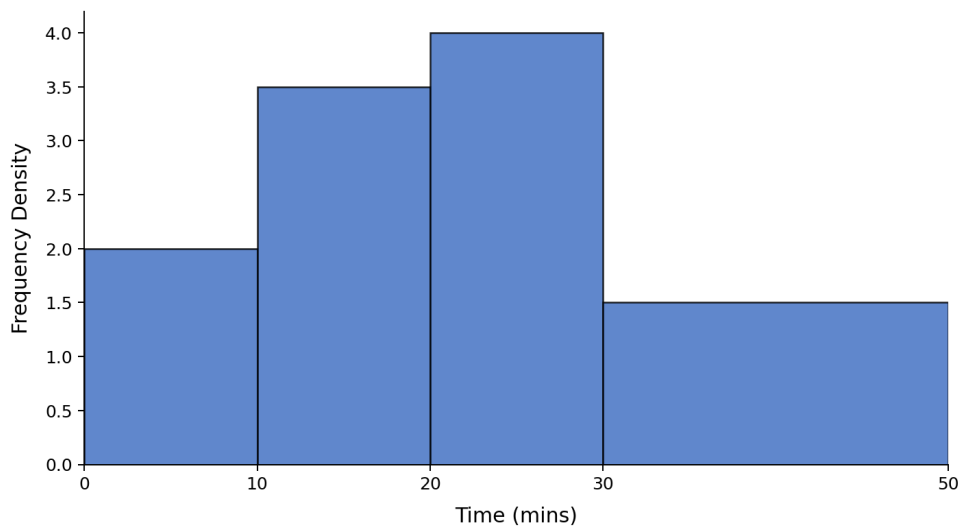
- (a) Calculate the frequency density for each class. (3)
- (b) Draw the histogram on the axes below. (3)



(6 marks)

[Reasoning]

3.



Estimate the number of people whose time was between 15 and 25 minutes.

(3 marks)

**[Reasoning]**

4.

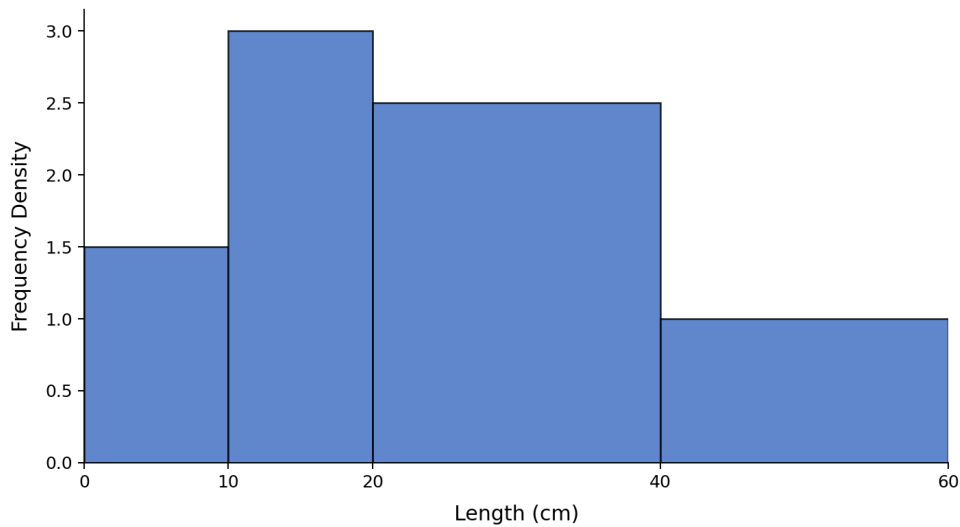
Age (years)	0–10	10–20	20–40	40–60	60–80
Frequency	15	25	60	40	20

- (a) Calculate the frequency density for each class. (3)
 (b) Draw the histogram. (3)

(6 marks)

[Reasoning]

5.



- (a) Find the frequency for each class. (3)
 (b) Find the total number of items. (1)
 (c) Find the modal class. (1)

(5 marks)

[Problem Solving]

6.

A histogram shows data for 120 people's journey times.

The class 20–30 min has frequency density 4.5.

- (a) How many people had a journey time of 20–30 minutes? (2)
 (b) The class 30–60 min has 18 people. Find its frequency density. (2)

(4 marks)



Section B — Higher

Worked Examples

[Fluency]

Find the frequency density if frequency=24 and class width=8.

$$FD = \frac{24}{8} = 3$$

[Reasoning]

The histogram has a missing bar. Total=200. Find the missing frequency.

Known frequencies: $20+35+40+30=125$. Missing = $200-125=75 \rightarrow FD=75 \div 20=3.75$

[Problem Solving]

Estimate the median from a histogram.

Find the class containing the median (cumulative frequency reaches $n/2$), then interpolate within that class.

[Fluency]

1.

Length (mm)	0–5	5–15	15–20	20–35	35–50
Freq. density	4	2	6	3	1

- Find the frequency for each class. (4)
- Find the total frequency. (1)
- Draw the histogram. (3)

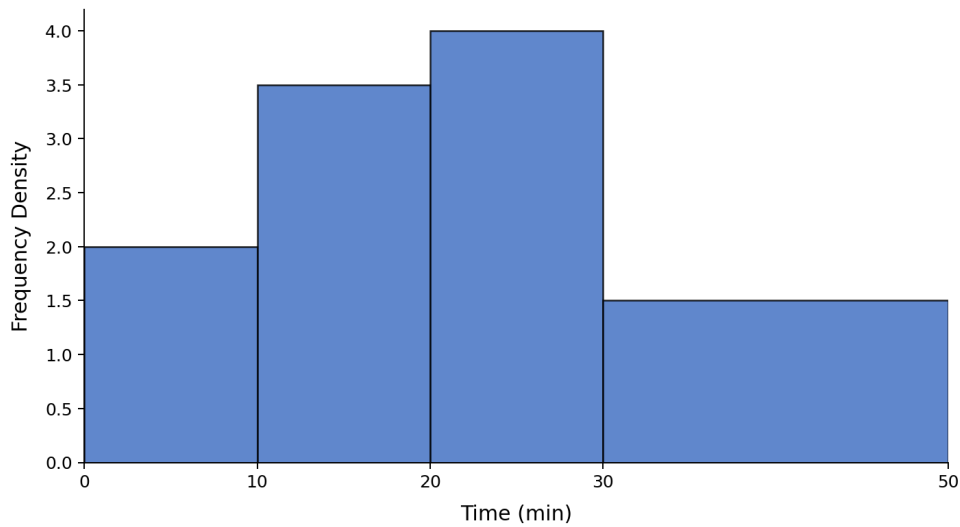
(8 marks)





[Reasoning]

2.



The total frequency is 200. One bar has been omitted.

The missing class is 10–20 min.

- (a) Find the frequencies of all visible classes. (3)
- (b) Find the missing frequency and draw the bar. (3)

(6 marks)

[Reasoning]

3.

Time (min)	0–10	10–20	20–30	30–50
Frequency	20	35	40	30

- (a) Draw the histogram. (3)
- (b) Estimate the median time. (3)

(6 marks)

[Problem Solving]

4.

A histogram for journey times has these frequency densities:

Time (min)	0–15	15–30	30–45	45–60
Freq. density	2	5	4	1

- (a) Find each frequency. (3)
- (b) Estimate the mean journey time. (3)
- (c) Estimate the percentage of journeys taking more than 35 minutes. (3)

(9 marks)

**[Problem Solving]****5.**

Explain why a histogram must be used for grouped data with unequal class widths, rather than a standard bar chart.

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