Your notes

GCSE Maths: revision notes

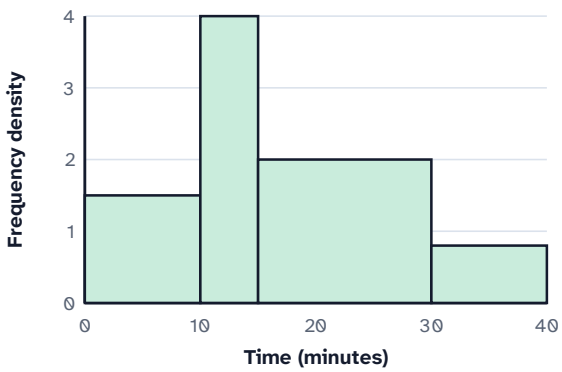
Histograms

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Frequency density

- A **histogram** shows grouped **continuous data**, often with unequal **class widths**. The bars touch, and the area of each bar shows the frequency.
- **Frequency density** = frequency ÷ **class width**. It goes on the vertical axis.
- A group $10 < t \leq 30$ with a frequency of 16 has a **class width** of 20 and a **frequency density** of $16 \div 20 = 0.8$.



Reading a histogram

- Frequency = **frequency density** × **class width**.
- To estimate how many values are in part of a group, use that part of the bar: half the width holds about half the frequency.

Drawing a histogram

- Work out the **class width** and **frequency density** for each group. Draw bars with no gaps, from the start to the end of each group.
- Label the vertical axis '**frequency density**', not 'frequency'.

Why use a histogram?

- If the groups have different widths, a bar chart of frequencies is misleading, because wide groups look too big. Using **area** keeps the comparison fair.

Worked examples

A class $10 < t \leq 30$ has a frequency of 24. Find the frequency density.

Find the class width. **$30 - 10 = 20$**

Frequency density = frequency ÷ class width. **$24 \div 20 = 1.2$**

Answer: 1.2

Key terms

Histogram	A chart for grouped continuous data where the area of each bar shows the frequency.
Frequency density	Frequency ÷ class width.
Class width	The size of a group, such as 20 for $10 < t \leq 30$.
Continuous data	Data that can take any value in a range, such as time or height.
Area	For a histogram bar, frequency density × class width = frequency.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What goes on the vertical axis of a histogram?
2. How do you work out frequency density?
3. The group $10 < t \leq 30$ has a frequency of 16. What is its frequency density?
4. A bar has a frequency density of 2.5 and a class width of 8. What is its frequency?
5. In a histogram, what does the area of a bar show?
6. Why are histograms used when groups have different widths?
7. Do the bars of a histogram have gaps between them?
8. The group $0 < x \leq 5$ has a frequency of 15. What is its frequency density?

Answers

1. Frequency density
2. Frequency divided by class width
3. 0.8
4. 20
5. The frequency
6. Using area keeps the comparison fair
7. No, the bars touch

Your notes

What to do next

Practise 12 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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