

Histograms

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

The class $20 < t \leq 30$ has frequency 18. Find the height of its bar.

Step 1 · Class width

$$30 - 20 = 10$$

Step 2 · $fd = f \div \text{width}$

$$18 \div 10 = 1.8$$

Answer: Frequency density 1.8

Check: $1.8 \times 10 = 18$ ✓

2. Now try one with the steps

A bar from 30 to 50 has height 0.5. How many values are in this class?

Step 1 · Width

Step 2 · $f = fd \times \text{width}$

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Find the frequency density for $0 < h \leq 5$. [1]

2. Same data: find the frequency density for $5 < h \leq 10$. [1]

3. Same data: find the frequency density for $10 < h \leq 20$. [1]

4. Same data: find the frequency density for $30 < h \leq 50$. [1]

5. Same data: which class has the tallest bar? [1]

6. Same data: how many plants are there in total? [1]

7. Same data: estimate the number of plants between 15 cm and 25 cm. [3]

8. Same data: estimate the number of plants taller than 40 cm. [2]

9. Same data: estimate the mean height to 1 decimal place (cm). [3]

10. Same data: estimate the median height, in cm. [3]

11. A histogram bar from 60 to 80 has height 1.5. Find the frequency. [1]

12. A class $4 < x \leq 6$ has frequency 9. Find its frequency density. [1]

13. On a histogram, a bar from 10 to 15 of height 6 represents 24 people. How many people does a bar from 15 to 25 of height 3 represent? [3]

14. Why are histograms with unequal widths drawn with frequency density, not frequency? [1]

15. Same plant data: what fraction of the plants are 10 cm or shorter? Give it in its simplest form. [2]

4. Before you hand it in

Plotting frequency on the vertical axis

With unequal widths the vertical axis is frequency DENSITY = frequency $\div$ width.

Reading the bar height frequency

Frequency = height $\times$ width — the area of the bar.

Taking a whole class when only part is needed

Multiply the frequency density by the width of the PART you need.

Using the wrong class width, e.g. 5 for 10–20

Width = upper bound – lower bound. Check each class separately.