Your notes

GCSE Statistics: revision notes

Histograms and frequency polygons

Contents

1. Histograms
2. Reading histograms
3. Frequency polygons
4. Key terms
5. Quick questions
6. What to do next

Histograms

- **Histograms** show grouped continuous data. There are no gaps between the bars.
- When classes have different widths, the vertical axis shows **frequency density**, not frequency.
- **Frequency density** = frequency ÷ **class width**. The area of each bar is proportional to the frequency.
- Example: the class $10 \leq t < 30$ has frequency 16. Its width is 20, so its **frequency density** is $16 \div 20 = 0.8$.

Reading histograms

- Frequency = **frequency density** × **class width**. A bar 5 wide with **frequency density** 3.2 has frequency 16.
- To estimate how many values lie in part of a class, assume the data is spread evenly across the class and take the matching fraction of the bar's area.
- Example: $20 \leq x < 30$ has **frequency density** 1.6 and $30 \leq x < 50$ has **frequency density** 2. The estimated number between 25 and 40 is $5 \times 1.6 + 10 \times 2 = 8 + 20 = 28$.

Frequency polygons

- A **frequency polygon** plots the frequency of each class at its **midpoint**, joined with straight lines.
- Two **frequency polygons** on the same axes make it easy to compare distributions, such as the heights of Year 7 and Year 11 students.

© LycoLearn · lycolearn.co.uk · Free GCSE and KS3 revision

Key terms

Histogram	A diagram for grouped continuous data where bar area shows frequency.
Frequency density	Frequency divided by class width.
Class width	The difference between the upper and lower class boundaries.
Frequency polygon	Frequencies plotted at class midpoints and joined with straight lines.
Midpoint	The value halfway between the class boundaries.

Quick questions

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

1. What is the formula for frequency density?
2. A class $10 \leq t < 30$ has frequency 16. What is its frequency density?
3. A bar is 5 units wide with frequency density 3.2. What is its frequency?
4. In a histogram, what represents frequency?
5. Are there gaps between bars in a histogram?
6. Where are points plotted on a frequency polygon?
7. What is the midpoint of the class $20 \leq m < 30$?
8. Why are frequency polygons useful?

Answers

1. Frequency divided by class width
2. 0.8
3. 16
4. The area of each bar
5. No
6. At the class midpoints
7. 25
8. They make it easy to compare two distributions

What to do next

Practise 10 questions on this topic

Try 3 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.

Your notes