Your notes

GCSE Maths: revision notes

Relative frequency and expected outcomes

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Relative frequency

- **Relative frequency** = number of times an event happens ÷ number of **trials**. It is an estimate of the probability, found by experiment.
- A drawing pin lands point up 36 times in 120 throws. The **relative frequency** is 36/120 = 0.3.
- The more **trials** you do, the more reliable the estimate.

Expected outcomes

- Expected number = probability × number of **trials**.
- A fair dice rolled 300 times should give about 300 × 1/6 = 50 sixes.
- If P(late) = 0.15, you would expect about 0.15 × 200 = 30 late trains in 200 journeys.

Fair or biased?

- A fair (unbiased) object has equally likely outcomes. If the results over many **trials** are very different from what you'd expect, the object may be **biased**.
- A coin that lands on heads 70 times in 100 flips may well be **biased**. 7 heads in 10 flips is not enough evidence.

Frequency trees and two-way tables

- A **frequency tree** shows how a group splits into categories, then into more categories.
- A **two-way table** shows data sorted by two sets of categories. Use the totals to find probabilities.

Key terms

Relative frequency	The number of times an event happens ÷ the number of trials.
Trial	One go at an experiment, such as one roll of a dice.
Expected outcome	Probability × number of trials.
Biased	Not fair: the outcomes are not equally likely.
Frequency tree	A diagram showing how a group splits into categories.
Two-way table	A table showing data sorted by two sets of categories.

Quick questions

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

1. A drawing pin lands point up 36 times in 120 throws. What is the relative frequency of landing point up?
2. How do you work out relative frequency?
3. How can you make a relative frequency estimate more reliable?
4. A fair dice is rolled 300 times. How many sixes would you expect?
5. The probability a train is late is 0.15. How many late trains would you expect in 200 journeys?
6. What does biased mean?
7. A coin lands on heads 70 times in 100 flips. What would you say?
8. A spinner lands on red 45 times in 150 spins. Estimate the probability of red.

Answers

1. 0.3
2. The number of times it happens divided by the number of trials
3. Do more trials
4. 50
5. 30
6. The outcomes are not equally likely
7. It may be biased
8. 0.3

What to do next

Practise 12 questions on this topic

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

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