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# AQA GCSE Maths – Probability

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**Subject:** Maths

**Grade:** KS4

Detailed revision guide for the Probability topic in AQA GCSE Maths covering definitions, examples, methods, advantages, disadvantages, and practice questions.

## Probability – AQA GCSE Maths (8300)

### Key Concepts

- Probability scale (0 to 1, 0% to 100%)
- Experimental vs theoretical probability
- Mutually exclusive and independent events
- Combined events: AND/OR rules
- Venn diagrams, tree diagrams, and tables
- Relative frequency and probability estimates

### Definitions & Examples

- Probability: A measure of how likely an event is to happen, between 0 (impossible) and 1 (certain).
- Experimental Probability: Probability estimated from actual experiments or trials, e.g., flipping a coin 100 times.
- Theoretical Probability: Probability based on known equally likely outcomes, e.g., rolling a fair die:  $P(3) = 1/6$ .
- Mutually Exclusive: Events that cannot happen at the same time, e.g., rolling a 2 or 5 on a single die.
- Independent Events: The outcome of one event does not affect the other, e.g., flipping two coins.

### Methods

- Calculate probability using  $P(E) = \text{Number of favorable outcomes} / \text{Total outcomes}$
- Use addition rule for mutually exclusive events:  $P(A \text{ or } B) = P(A) + P(B)$
- Use multiplication rule for independent events:  $P(A \text{ and } B) = P(A) \times P(B)$
- Draw and interpret Venn diagrams, tree diagrams, and tables
- Estimate probability from relative frequency of repeated experiments

### Advantages & Disadvantages

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- Advantages: Helps predict outcomes, supports statistical reasoning, widely applicable in science, finance, and risk assessment.
  - Disadvantages: Real-life events may not be equally likely, experimental probability can be inaccurate with few trials, complex when many combined events exist.

## Practice Questions

- A fair coin is flipped. Find  $P(\text{Heads})$ .
- Two dice are rolled. Find the probability of getting a 4 on both dice.
- A bag contains 3 red and 2 blue balls. Find  $P(\text{red or blue})$ .
- Use a tree diagram to find the probability of getting at least one six when rolling two dice.
- In 100 trials, an event occurred 45 times. Estimate its probability.