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

Advantages & Disadvantages

- 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(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(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.