Your notes

GCSE Maths: revision notes

Probability basics

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The probability scale

- **Probability** measures how likely something is, from 0 (impossible) to 1 (certain). It can be written as a fraction, a decimal or a percentage.
- Words for likelihood: impossible, unlikely, even chance (½), likely, certain.



Equally likely outcomes

- P(**event**) = number of ways it can happen ÷ total number of **equally likely outcomes**.
- Rolling a **fair** dice: P(even) = 3/6 = ½. Picking from 3 red and 5 blue counters: P(red) = 3/8.

When something does not happen

- P(not A) = 1 – P(A). If P(rain) = 0.3, then P(no rain) = 0.7.
- The probabilities of all the possible **outcomes** add up to 1. If P(red) = 0.2 and P(blue) = 0.5, and green is the only other colour, then P(green) = 0.3.

Sample spaces

- A **sample space** lists every possible **outcome**. Rolling two dice gives 6 × 6 = 36 **outcomes**, and 6 of them total 7, so P(total of 7) = 6/36 = 1/6.
- List **outcomes** in a system so you don't miss any.
- **Mutually exclusive events** cannot happen at the same time. For them, P(A or B) = P(A) + P(B).

Worked examples

A bag has 3 red, 5 blue and 2 green counters. One is taken at random. Find P(not blue).

Count all the counters. **3 + 5 + 2 = 10**

Count the ones that aren't blue. **3 + 2 = 5**

Probability = number of ways it can happen ÷ total. **5/10**

Answer: 1/2

Key terms

Probability	How likely something is to happen, from 0 to 1.
Outcome	One possible result, such as rolling a 4.
Event	One or more outcomes, such as rolling an even number.
Equally likely	Having the same chance of happening.
Sample space	A list or table of all the possible outcomes.
Mutually exclusive	Events that cannot happen at the same time.
Fair	Having equally likely outcomes; not biased.

Quick questions

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

1. What is the probability of an impossible event?
2. A fair dice is rolled. What is the probability of an even number?
3. A bag has 3 red and 5 blue counters. What is the probability of picking red?
4. The probability of rain is 0.3. What is the probability of no rain?
5. A spinner lands on red with probability 0.2 and blue with probability 0.5. The only other colour is green. What is P(green)?
6. Two fair dice are rolled. How many possible outcomes are there?
7. Two fair dice are rolled and the scores are added. What is the probability of a total of 7?
8. Which words describe a probability of 0.5?

Answers

1. 0
2. 1/2
3. 3/8
4. 0.7
5. 0.3
6. 36
7. 1/6
8. Even chance

Your notes

What to do next

Practise 12 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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