Name	Date started	Target end date

WJEC GCSE Mathematics and Numeracy (Double Award) — Question Pack

The probability of a single event, the probability scale, the 'not A' rule, and adding probabilities for mutually exclusive events.
Source

REVISE
.wales

2.20 — Basic probability of events

Spec 3.5.1, 3.5.2 — Unit 2 (no calculator)

The probability of a single event, the probability scale, the 'not A' rule, and adding probabilities for mutually exclusive events. Sourced from legacy WJEC GCSE Mathematics / Mathematics–Numeracy Higher non-calculator papers, organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~24 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (16 marks across 5 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification. Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working — method marks are awarded for clear setup.

*A calculator is **not** permitted on any question in this pack (Unit 2 is the non-calculator paper).*

Basic probability of events — what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 2: non-calculator.

Probability of an event 3.5.1

- $P(\text{event}) = \dfrac{\text{favourable outcomes}}{\text{total outcomes}}$ when outcomes are equally likely.
- Express as a fraction, decimal, or percentage.
- $0 \leq P \leq 1$.

Probability scale 3.5.1

- $P = 0$ impossible, $P = 1$ certain, $P = 1/2$ equally likely.
- Mark events on a 0–1 scale to compare likelihoods.
- Never use a ratio.

Complement 3.5.2

- $P(\overline{A}) = 1 - P(A)$.
- All outcomes' probabilities sum to 1.
- Use the complement when the 'not A' count is easier.

Mutually exclusive events 3.5.2

- Disjoint events: $P(A \cup B) = P(A) + P(B)$.
- Check the events can't both happen.
- List a sample space when uncertain.

Crib sheet »

Basic probability of events in one page

Quick-reference notes — revisit before each question. Don't use during the questions.

Probability of an event

$$P(\text{event}) = \frac{\text{favourable outcomes}}{\text{total outcomes}}$$

Works when every outcome is equally likely.

E.g. a fair die: $P(\text{even}) = 3/6 = 1/2$.

The probability scale

$$0 \le P \le 1$$

$P = 0$: impossible. $P = 1$: certain. $P = 1/2$: equally likely.

Express as a fraction, decimal, or percentage — not a ratio like 1:2.

P(not A)

$$P(\overline{A}) = 1 - P(A)$$

Useful when the complement is easier to count.

E.g. $P(\text{at least one head})$ found via $1 - P(\text{no heads})$.

Mutually exclusive events

$$P(A \cup B) = P(A) + P(B)$$

Holds only when A and B can't both happen (no overlap).

The total probability of all mutually exclusive outcomes equals 1.

Sample space

List every possible outcome, or use a two-way table / grid for two events (two dice, coin and die).

Count favourable outcomes from the grid — halves the chance of double-counting.

Worked example

Bag has 3 red, 4 blue, 5 green balls. $P(\text{red}) = 3/12 = 1/4$. $P(\text{not red}) = 1 - 1/4 = 3/4$. $P(\text{red or blue}) = 3/12 + 4/12 = 7/12$.

Reading the question

'At least one' usually means try the complement first.

'Or' on disjoint events: add probabilities.

'And' (independent events): multiply — covered in detail in tree-diagram packs.

Common traps

- Writing a probability as a ratio like 3:12.
- Forgetting to simplify the fraction.
- Treating overlapping events as mutually exclusive.
- A probability > 1 or negative — check your arithmetic.

Examiner only

1. A fair six-sided dice and a fair coin are thrown together once.

Circle the correct answer for each of the following statements.

(a) The number of possible outcomes is [1]

2 6 8 12 24.

(b) The probability of getting a **4** on the dice and a **tail** on the coin is [1]

$\frac{1}{8}$ $\frac{1}{12}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{24}$.

(c) The probability of getting a **multiple of 3** on the dice and a **head** on the coin is [1]

$\frac{1}{8}$ $\frac{1}{12}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{24}$.

Space for working:

Examiner only

1. *(a)* Caryl has two fair dice.

Dice A is a cube. It shows the numbers 1 to 6.
Dice B is a tetrahedron. It shows the numbers 1 to 4.

Caryl throws both dice.

What is the probability that she throws a 5 on dice A and a 3 on dice B? [2]

(b) Asif has a biased four-sided dice.
The dice shows the numbers 10, 20, 30 and 40.

Asif throws the dice once.

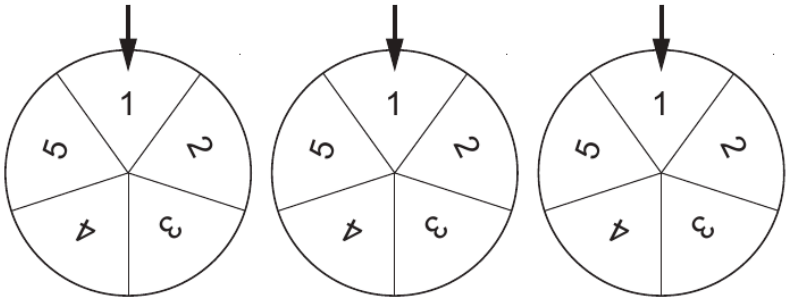
The table below gives the probability of obtaining each number.

Number	10	20	30	40
Probability	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{10}$

What is the probability that Asif throws a 30 or a 40? [2]

Examiner only

13. Three fair spinners are shown in the diagram below.

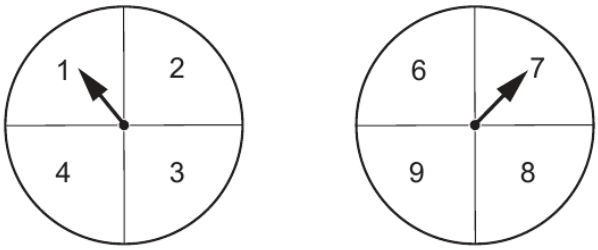


The three spinners are spun.
Calculate the probability that all the spinners will land on an even number. [2]

Examiner only

3. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Vera has two fair spinners.
Each spinner is divided into quarters.
One spinner shows the values 1, 2, 3 and 4.
The other spinner shows the values 6, 7, 8 and 9.



Vera spins the two spinners. She then multiplies the two values together to form a product.
For example, the diagram above forms the product $1 \times 7 = 7$.

Consider the ways in which all the possible products can be formed.
Calculate the probability that the spinners will form a product that is a factor of 36.
You must show all your working to justify your answer. [4 + 2 OCW]

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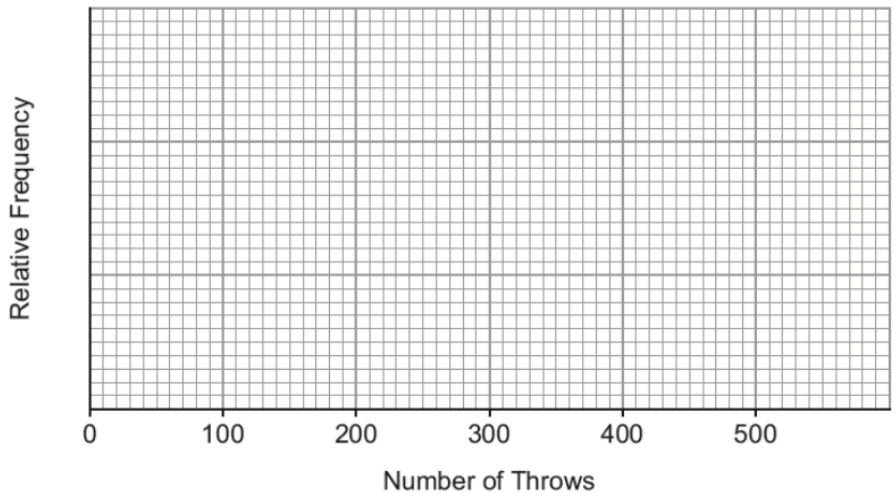
Relative Frequency
0
100
200
300
400
500
Number of Throws