Class 9 Maths Chapter 7: The Mathematics of Maybe: Introduction to Probability - Notes, Important Questions and MCQs (2026-27)

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These Class 9 Maths Chapter 7 notes cover “The Mathematics of Maybe: Introduction to Probability” from the new NCERT textbook Ganita Manjari (Part I, 2026-27): randomness, the probability scale from 0 to 1, experimental and theoretical probability, using data to estimate probability, sample spaces, events and tree diagrams – with tables, solved examples, Q&A, 10 MCQs and a free PDF.

Use the table of contents below to jump to the part you need, or read top to bottom for a complete revision of the chapter.

Table of Contents

- Chapter Overview
- Important Topics and Concepts
- Solved Examples
- Experimental vs Theoretical Probability
- Important Terms and Formulas
- Short Answer Questions
- Long Answer Questions
- MCQs with Answers
- Quick Revision Points
- Chapter Summary
- Exam Tips and PYQ Pattern
- Frequently Asked Questions
- Conclusion

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Chapter Overview

Probability measures how likely something is to happen. Many everyday events are random – we cannot predict the exact result of tossing a coin or tomorrow’s weather – but we can measure their likelihood on a scale from 0 (impossible) to 1 (certain).

Probability can be found experimentally, by repeating trials and counting results, or theoretically, by counting equally likely outcomes. Listing the sample space, identifying events and drawing tree diagrams make calculations systematic and help in decisions based on data.

Important Topics and Concepts

Randomness and the Probability Scale

- A random experiment has outcomes that cannot be predicted with certainty (tossing a coin, rolling a die).
- Probability of an event E is written P(E), with $0 \le P(E) \le 1$.
- 0 = impossible, ½ = even chance, 1 = certain; words like unlikely and likely lie in between.
- Probabilities can be written as fractions, decimals or percentages.

Experimental Probability

- Found by performing trials: P(E) = number of times E occurred ÷ total number of trials.
- Example: a coin tossed 50 times shows heads 27 times → P(H) = 27/50 = 0.54.
- As the number of trials increases, experimental probability tends to get closer to the theoretical value.
- Data from surveys or records (e.g. rainfall, defective items) can be used to estimate probabilities and make decisions.

Theoretical Probability

- When all outcomes are equally likely: P(A) = favourable outcomes ÷ total possible outcomes.
- Coin: P(H) = ½. Die: P(even) = 3/6 = ½. P(number > 4) = 2/6 = 1/3.
- Sum of probabilities of all outcomes = 1.
- P(not A) = 1 – P(A).

Sample Spaces and Events

- Sample space S = list of all possible outcomes, e.g. one die: S = {1, 2, 3, 4, 5, 6}.
- Two coins: S = {HH, HT, TH, TT}.
- An event is one outcome or a group of outcomes, e.g. “getting a prime number” = {2, 3, 5}.
- Impossible event: no outcomes (P = 0); sure event: all outcomes (P = 1).

Tree Diagrams and Geometric Probability

- A tree diagram lists outcomes stage by stage – branches for each choice.
- Two coins: first branch H/T, second branch H/T → 4 outcomes.
- Count favourable end points to find probability.
- Geometric probability: if a dart lands randomly on a region, P = favourable area ÷ total area.

Solved Examples

Board-pattern practice.

- A die is rolled. P(prime)? Primes {2, 3, 5} → 3/6 = ½.
- Two coins tossed. P(at least one head)? {HH, HT, TH} → 3/4.
- A bag has 3 red and 5 blue balls. P(red)? 3/8; P(not red) = 5/8.
- In 200 bulbs tested, 12 were defective. Estimate P(defective). 12/200 = 0.06.
- A point is chosen at random in a 4 m × 5 m rectangle containing a circle of radius 1 m. P(inside circle)? $\pi(1)^2 / 20 = \pi/20 \approx 0.157$.

Experimental vs Theoretical Probability

Basis	Experimental	Theoretical
Based on	Actual trials and data	Equally likely outcomes
Formula	Times event occurred ÷ total trials	Favourable ÷ total outcomes
Changes with trials?	Yes	No
Example (coin)	27 heads in 50 tosses = 0.54	½ = 0.5
Use	Real-world data, surveys	Fair coins, dice, cards

Important Terms and Formulas

Term	Meaning
Probability	Measure of likelihood between 0 and 1
Random experiment	Experiment with unpredictable outcomes
Outcome	A possible result
Sample space (S)	Set of all outcomes
Event	One or more outcomes
Experimental probability	Occurrences ÷ trials
Theoretical probability	Favourable ÷ total outcomes
Complement	P(not A) = 1 – P(A)
Tree diagram	Branching diagram listing outcomes
Geometric probability	Favourable area ÷ total area

Short Answer Questions

Q1. What is the range of probability?

From 0 to 1, i.e. $0 \leq P(E) \leq 1$.

Q2. Write the sample space for tossing two coins.

{HH, HT, TH, TT}.

Q3. A die is rolled. Find P(getting 7).

0 – it is an impossible event.

Q4. Define experimental probability.

The number of times an event occurs divided by the total number of trials.

Q5. If P(A) = 0.35, find P(not A).

0.65.

Q6. A card is drawn from 1–10. Find P(multiple of 3).

{3, 6, 9} → 3/10.

Q7. What is a tree diagram used for?

Q8. What happens to experimental probability with more trials?

It usually gets closer to the theoretical probability.

Long Answer Questions

Q1. A coin is tossed 100 times: 56 heads, 44 tails. Compare experimental and theoretical probabilities.

Experimental P(H) = 56/100 = 0.56.

Experimental P(T) = 44/100 = 0.44.

Theoretical P(H) = P(T) = 0.5.

Difference is due to randomness in a limited number of trials.

More trials would bring values closer to 0.5.

Q2. Draw a tree diagram for tossing a coin and rolling a die. Find P(head and even number).

First branch: H or T.

From each, six branches: 1–6.

Total outcomes = 2 × 6 = 12.

Favourable: H2, H4, H6 = 3.

P = 3/12 = ¼.

Q3. A survey of 400 students found 120 travel by bus. Use this to estimate and make a decision.

P(bus) = 120/400 = 0.3.

For a school of 1,200 students, expected bus users ≈ 0.3 × 1200 = 360.

Plan buses for about 360 students.

Data-based probability guides planning.

Estimates improve with larger samples.

MCQs with Answers

1. Probability of a sure event is(a) 0 (b) ½ (c) 1 (d) 2Answer: (c) 1

2. Probability of an impossible event is(a) 0 (b) 1 (c) –1 (d) ½Answer: (a) 0

3. P(even) when rolling a die(a) 1/6 (b) 1/3 (c) 1/2 (d) 2/3Answer: (c) 1/2

4. Number of outcomes when two coins are tossed(a) 2 (b) 3 (c) 4 (d) 6Answer: (c) 4

5. If P(A) = 0.7, P(not A) =(a) 0.7 (b) 0.3 (c) 1.7 (d) 0Answer: (b) 0.3

6. Which cannot be a probability?(a) 0.5 (b) 1 (c) 1.2 (d) 0Answer: (c) 1.2

7. P(at least one head) in two coin tosses(a) 1/4 (b) 1/2 (c) 3/4 (d) 1Answer: (c) 3/4

8. Experimental probability is based on(a) assumptions (b) trials (c) formulas only (d) guessesAnswer: (b) trials

10. Sample space of a die has(a) 5 (b) 6 (c) 12 (d) 36Answer: (b) 6 – outcomes

Quick Revision Points

- 0 ≤ P(E) ≤ 1; 0 impossible, 1 certain.
- Experimental = occurrences ÷ trials.
- Theoretical = favourable ÷ total.
- Sample space and events; P(not A) = 1 – P(A).
- Tree diagrams for multi-stage experiments.
- Geometric probability = area ratio.

Chapter Summary

Probability measures the likelihood of an event on a scale from 0 to 1. It can be estimated experimentally from trials or data, or calculated theoretically when outcomes are equally likely.

The sample space lists all outcomes and an event is any set of them; complementary events have probabilities adding to 1. Tree diagrams organise multi-stage experiments, and geometric probability uses areas. Probability helps make sensible decisions under uncertainty.

Exam Tips and PYQ Pattern

- Always write the sample space first.
- Check that answers lie between 0 and 1.
- Use tree diagrams for two-step experiments.
- Distinguish experimental from theoretical clearly.
- Simplify fractions in final answers.

Frequently Asked Questions

Is this chapter in the 2026-27 CBSE syllabus?

Yes. It is part of the new NCERT Class 9 Maths textbook “Ganita Manjari” (Part I), prescribed for the 2026-27 session.

Can I download these notes as a PDF?

Yes. Use the free PDF link at the top of this page – no signup needed.

What is the difference between experimental and theoretical probability?

Experimental probability comes from actual trials; theoretical probability is calculated from equally likely outcomes.

What is a sample space?

The set of all possible outcomes of a random experiment, e.g. {1, 2, 3, 4, 5, 6} for a die.

Conclusion

The Mathematics of Maybe teaches you to measure uncertainty. Learn the comparison table, practise the solved examples here and save the free PDF for revision.

More Notes: Class 9 Maths Chapter 6: Measuring Space: Perimeter and Area notes | Class 9 Maths Chapter 8: Predicting What Comes Next: Exploring Sequences and Progressions notes | All Class 9 Maths notes

Author Bio: Written and reviewed by the Nextoper Editorial Team, a group of CBSE mathematics educators who build chapter notes directly from the NCERT textbook and past board paper patterns.

Freshness Note: These notes follow the NCERT Class 9 Maths textbook, Ganita Manjari (Parts I and II, first edition 2026, NCF-SE 2023), and the CBSE syllabus for the 2026-27 session. Last checked on 24 November 2026.