NCERT Solutions for Class 10 Maths Chapter 15 Ex 15.2 | Probability 2026-27

⚡ **Quick Revision Box — Probability Ex 15.2**

- **Chapter:** 15 — Probability | Class 10 Maths (NCERT)
- **Exercise 15.2:** Contains 5 questions — all based on theoretical probability
- **Key Formula:** P(E) = (Number of favourable outcomes)/(Total number of outcomes)
- **Complementary Events:** $P(E) + P(\bar{E}) = 1$
- **Sample Space (5-day week, 2 people):** 5 × 5 = 25 equally likely outcomes
- **Algebraic Probability:** Set up equations using P(E) expressions — used in Q3, Q4, Q5
- **CBSE Weightage:** Probability carries 4–5 marks in Class 10 board exams
- **Academic Year:** Updated for 2026-27 CBSE syllabus

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📘 **Updated for 2026-27 Rationalised Syllabus:** This page reflects the latest NCERT syllabus for Class 10 Maths. Exercise 15.2 is part of the current CBSE 2026-27 syllabus. Any content removed from the rationalised syllabus is clearly labelled at the bottom of this page.

The **NCERT Solutions for Class 10 Maths Chapter 15 Ex 15.2** on this page cover all 5 questions from the Probability exercise, fully solved with step-by-step working — updated for the **2026-27** CBSE board exam. You can find these solutions as part of our complete [NCERT Solutions for Class 10](#) collection. Whether you are preparing for your board exam or doing homework, these answers will help you understand exactly how to approach probability problems involving sample spaces, algebraic equations, and real-world scenarios. This exercise is part of the [NCERT Solutions](#) library at ncertbooks.net, verified against the official [NCERT official textbook](#).

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Chapter Overview — Probability Class 10 Chapter 15

Chapter 15 of the NCERT Class 10 Maths textbook introduces **Theoretical Probability** (प्रायिकता). It builds on the experimental probability you studied in Class 9 and formalises the concept using equally likely outcomes and sample spaces. Exercise 15.2 is the second and final exercise in this chapter, and it contains 5 application-based problems that test your ability to construct sample spaces, set up algebraic probability equations, and interpret real-world scenarios.

For the **CBSE 2026-27 board exam**, Probability is part of the Statistics and Probability unit, which together carry around 11 marks. Questions from this chapter typically appear as 2-mark or 3-mark problems. You need to be comfortable with listing sample spaces, computing favourable outcomes, and solving equations where probability is given as a condition.

Detail	Information
Chapter	15 — Probability
Exercise	15.2
Textbook	NCERT Mathematics — Class 10
Class	10 (Secondary)
Subject	Mathematics
Number of Questions	5
CBSE Marks Weightage	4–5 marks (Statistics & Probability unit)
Difficulty Level	Easy to Medium
Academic Year	2026-27

Key Concepts and Theorems — Theoretical Probability

Theoretical Probability (सैद्धांतिक प्रायिकता) assumes that all outcomes of an experiment are equally likely. You do not need to actually perform the experiment — you calculate the probability using logic and counting.

Key Concept 1 — Probability Formula:

$P(E)$ = (Number of outcomes favourable to E)/(Total number of equally likely outcomes)

Key Concept 2 — Sample Space (नमूना समष्टि): The set of all possible outcomes of a random experiment is called the sample space. For example, if two people each choose one of 5 days, the sample space has 5 × 5 = 25 outcomes.

Key Concept 3 — Complementary Events: If E is an event, then $\bar{E}$ (not E) is its complement. They satisfy:

$$P(E) + P(\bar{E}) = 1$$

Key Concept 4 — Range of Probability: For any event E:

$$0 \le P(E) \le 1$$

Key Concept 5 — Impossible and Certain Events: P(impossible event) = 0 and P(certain event) = 1.

Key Concept 6 — Algebraic Probability Setup: In several questions, you are given a condition like "probability of A is double that of B". You express both probabilities in terms of an unknown x, set up an equation, and solve. This approach is used in Questions 3, 4, and 5 of Exercise 15.2.

NCERT Solutions for Class 10 Maths Chapter 15 Ex 15.2 — All Questions Solved

Below are the complete, step-by-step **NCERT Solutions for Class 10 Maths Chapter 15 Ex 15.2**. Every question is answered in full — no steps are skipped. For CBSE board exams, always show your working clearly to earn full marks.
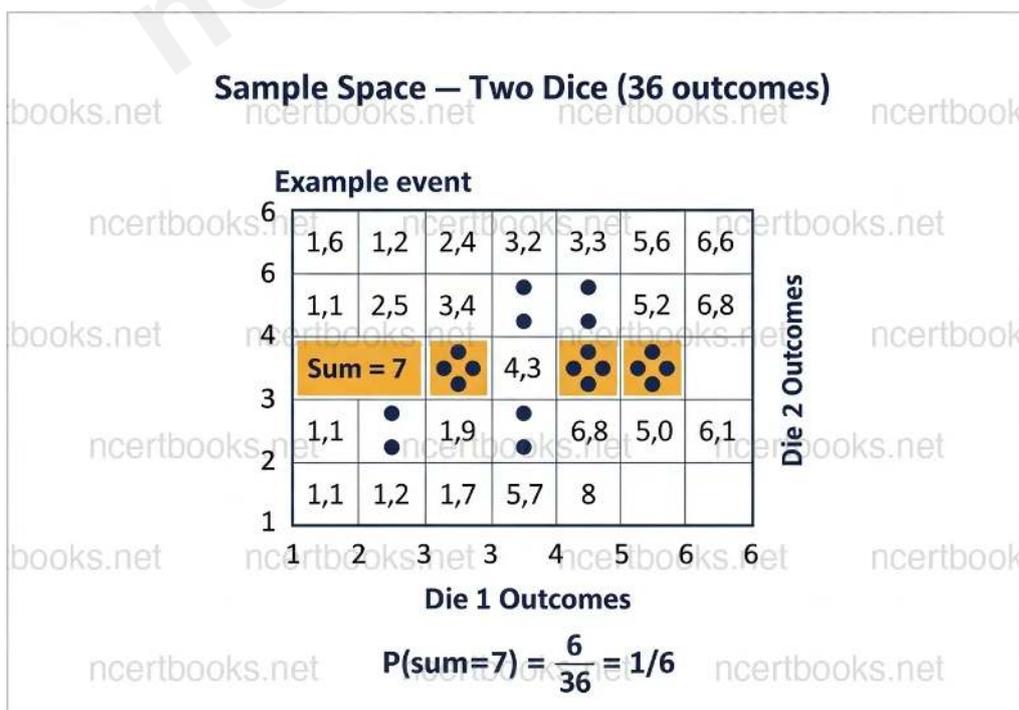

Sample Space — Two Dice (36 outcomes)

$$P(\text{sum}=7) = \frac{6}{36} = 1/6$$

Fig 15.1: Sample space for two dice — 36 equally likely outcomes

Question 1

Medium

Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on (i) the same day? (ii) consecutive days? (iii) different days?

Key Concept: The week here is Tuesday to Saturday — that is 5 days. Each person independently chooses one of 5 days. The total sample space = $5 \times 5 = 25$ equally likely outcomes.

Step 1 — List the sample space: Let the days be T (Tuesday), W (Wednesday), Th (Thursday), F (Friday), Sa (Saturday). Each ordered pair (Shyam's day, Ekta's day) is one outcome. Total outcomes = $5 \times 5 = 25$.

(i) Probability that both visit on the same day

Step 2: Favourable outcomes = both choose the same day = {(T,T), (W,W), (Th,Th), (F,F), (Sa,Sa)} = 5 outcomes.

$$P(\text{same day}) = 5/25 = 1/5$$

∴ **P(same day) = 1/5**

(ii) Probability that both visit on consecutive days

Step 3: Consecutive day pairs (in order): (T,W), (W,T), (W,Th), (Th,W), (Th,F), (F,Th), (F,Sa), (Sa,F) = 8 outcomes.

Why both orders? (T,W) means Shyam comes Tuesday and Ekta Wednesday. (W,T) means Shyam comes Wednesday and Ekta Tuesday. Both are consecutive-day visits, so both count.

$$P(\text{consecutive days}) = 8/25$$

∴ **P(consecutive days) = 8/25**

(iii) Probability that both visit on different days

Step 4: Use the complementary event: different days = NOT same day.

$$P(\text{different days}) = 1 - P(\text{same day}) = 1 - 1/5 = 4/5$$

Verification: Favourable outcomes for different days = 25 − 5 = 20. So P = 20/25 = 4/5. ✓

∴ **P(different days) = 4/5**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. List all favourable outcomes clearly and show the complementary event method for part (iii) to earn full marks.

Question 2

Medium

A die is numbered in such a way that its faces show the numbers 1, 2, 2, 3, 3, 6. It is thrown two times and the total score in two throws is noted. Complete the following table which gives a few values of the total score on the two throws. What is the probability that the total score is (i) even? (ii) 6? (iii) at least 6?

Key Concept: The die has faces: 1, 2, 2, 3, 3, 6. When thrown twice, total outcomes = 6 × 6 = 36. Build the complete sum table to count favourable outcomes.

Step 1 — Complete the sum table: Rows = first throw, Columns = second throw.

+	1	2	2	3	3	6
1	2	3	3	4	4	7
2	3	4	4	5	5	8
2	3	4	4	5	5	8
3	4	5	5	6	6	9
3	4	5	5	6	6	9
6	7	8	8	9	9	12

Step 2: Total outcomes = 36.

(i) Probability that total score is even

Step 3: Even sums from the table: 2, 4, 4, 4, 4, 8, 4, 4, 8, 4, 4, 8, 6, 6, 6, 6, 12 — count all even values: 2(×1), 4(×10), 6(×4), 8(×5), 12(×1) = 1+10+4+5+1 = **18 even outcomes**.

$$P(even) = 18/36 = 1/2$$

∴ **P(even total) = 1/2**

(ii) Probability that total score is 6

Step 4: From the table, sum = 6 appears at positions: (3,3), (3,3), (3,3), (3,3) — that is the four cells where row=3 and column=3 (two rows of 3 × two columns of 3) = **4 outcomes**.

$$P(\text{total} = 6) = 4/36 = 1/9$$

∴ **P(total = 6) = 1/9**

(iii) Probability that total score is at least 6

Step 5: "At least 6" means total ≥ 6. From the table, sums ≥ 6: 6(×4), 7(×2), 8(×5), 9(×4), 12(×1) = 4+2+5+4+1 = **15 outcomes**.

$$P(\text{total} \geq 6) = 15/36 = 5/12$$

∴ **P(total ≥ 6) = 5/12**

Board Exam Note: Always draw the complete 6×6 table in your answer sheet. Examiners award marks for the table itself. This type of question typically appears in 2-3 mark sections of CBSE board papers.

Fig 15.3: Standard deck of 52 cards — probability of drawing specific cards

Question 3

Easy

A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number of blue balls in the bag.

Key Concept: Let the number of blue balls = x. Total balls = 5 + x. Express both probabilities and use the given condition to form an equation.

Step 1 — Define variables:

Number of red balls = 5, Number of blue balls = x, Total = 5 + x.

Step 2 — Write the probability expressions:

$$P(red) = 5/5+x$$

$$P(blue) = x/5+x$$

Step 3 — Apply the given condition (P(blue) = 2 × P(red)):

$$x/5+x = 2 × 5/5+x$$

Step 4 — Solve the equation: Multiply both sides by (5+x):

$$x = 10$$

Verification: With x = 10: P(blue) = 10/15 = 2/3 and P(red) = 5/15 = 1/3. Indeed 2/3 = 2 × 1/3. ✓

∴ **Number of blue balls = 10**

Board Exam Note: Always verify your answer by substituting back. This type of question typically appears in 2-3 mark sections of CBSE board papers. Show the equation setup clearly.

Question 4

Medium

A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball? If 6 more black balls are put in the box, the probability of drawing a black ball is now double of what it was before. Find x.

Key Concept: This is a two-stage algebraic probability problem. First find P(black) before adding balls, then after adding 6 black balls, set the new probability equal to double the original and solve.

Step 1 — Probability before adding balls:

Total balls = 12, Black balls = x.

$$P_1(black) = x/12$$

Step 2 — Probability after adding 6 black balls:

New total = 12 + 6 = 18, New black balls = x + 6.

$$P_2(black) = x+6/18$$

Step 3 — Apply the given condition (new probability = double the original):

$$x+6/18 = 2 \times x/12$$

Step 4 — Simplify the right side:

$$x+6/18 = 2x/12 = x/6$$

Step 5 — Cross multiply:

$$6(x+6) = 18x$$

$$6x + 36 = 18x$$

$$36 = 12x$$

$$x = 3$$

Verification: Original: P_1 = 3/12 = 1/4. After adding: P_2 = 9/18 = 1/2. Is 1/2 = 2 × 1/4? Yes. ✓

∴ **x = 3** (There are 3 black balls originally in the box.)

Board Exam Note: Show both probability expressions and the equation clearly. This type of question typically appears in 2-3 mark sections of CBSE board papers. Cross-multiplication must be shown step by step.

Question 5

Easy

A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is 2/3. Find the number of blue marbles in the jar.

Key Concept: Total marbles are given. Use the probability of green to find the count of green marbles, then subtract from total to find blue marbles.

Step 1 — Find the number of green marbles:

Total marbles = 24. P(green) = 2/3.

$$\text{Number of green marbles} = P(green) \times Total = 2/3 \times 24 = 16$$

Step 2 — Find the number of blue marbles:

$$\text{Number of blue marbles} = 24 - 16 = 8$$

Verification: P(green) = 16/24 = 2/3. ✓

∴ **Number of blue marbles = 8**

Board Exam Note: This is a straightforward 2-mark question. Show the multiplication step clearly. Do not forget to subtract from the total — many students stop after finding the green count.

Formula Reference Table — Probability Class 10

Formula Name	Formula	Variables Defined
Theoretical Probability	$P(E) = \dfrac{n(E)}{n(S)}$	n(E) = favourable outcomes, n(S) = total outcomes
Complementary Event	$P(\bar{E}) = 1 - P(E)$	$\bar{E}$ = complement of event E
Range of Probability	$0 \leq P(E) \leq 1$	Always holds for any event
Certain Event	$P(S) = 1$	S = entire sample space
Impossible Event	$P(\varphi) = 0$	φ = empty set / impossible outcome
Sum of All Probabilities	$\sum P(E_i) = 1$	For mutually exclusive and exhaustive events

Solved Examples Beyond NCERT — Probability Class 10

Extra Example 1 — Cards from a Deck

Easy

A card is drawn at random from a well-shuffled deck of 52 cards. Find the probability that the card drawn is (i) a king (ii) not a king.

(i) P(king)

Step 1: There are 4 kings in a deck of 52 cards.

$$P(king) = 4/52 = 1/13$$

∴ **P(king) = 1/13**

(ii) P(not a king)

$$P(not\ a\ king) = 1 - 1/13 = 12/13$$

∴ **P(not a king) = 12/13**

Extra Example 2 — Algebraic Probability Setup

Medium

A bag has red and white balls in ratio 3:2. If the total number of balls is 20, find the probability of drawing a white ball.

Step 1: Ratio 3:2 means red = 12, white = 8 (since 3/5 × 20 = 12 and 2/5 × 20 = 8).

$$P(white) = 8/20 = 2/5$$

∴ **P(white) = 2/5**

Extra Example 3 — Two Coins Tossed

Easy

Two coins are tossed simultaneously. Find the probability of getting at least one head.

Step 1: Sample space = {HH, HT, TH, TT}. Total = 4.

Step 2: At least one head = {HH, HT, TH} = 3 outcomes.

$$P(at least one head) = 3/4$$

Alternative: P(at least one head) = 1 - P(no head) = 1 - 1/4 = 3/4. ✓

∴ **P(at least one head) = 3/4**

Important Questions for CBSE Board Exam 2026-27 — Chapter 15 Probability

1-Mark Questions

1. What is the probability of an impossible event? **Answer: 0**
2. If P(E) = 0.7, find P(Ē). **Answer: 1 - 0.7 = 0.3**
3. A bag has 3 red and 7 blue balls. What is the probability of drawing a red ball?
   Answer: 3/10

3-Mark Questions

1. **Q:** A bag contains 3 white, 5 black, and 2 red balls. One ball is drawn at random. Find the probability that it is (i) white (ii) not black.
   Answer: Total = 10. (i) P(white) = 3/10. (ii) P(not black) = 1 - 5/10 = 1/2.
2. **Q:** Cards numbered 1 to 25 are shuffled. One card is drawn. Find P(prime number).
   Answer: Primes from 1–25: 2,3,5,7,11,13,17,19,23 = 9 primes. P = 9/25.

5-Mark (Long Answer) Question

Q: Two dice are thrown simultaneously. Find the probability that the sum is (i) 7 (ii) less than or equal to 4 (iii) a multiple of 3.

Answer: Total outcomes = 36. (i) Sum 7: {(1,6),(2,5),(3,4),(4,3),(5,2),(6,1)} = 6. P = 6/36 = 1/6. (ii) Sum ≤ 4: {(1,1),(1,2),(2,1),(1,3),(3,1),(2,2)} = 6. P = 6/36 = 1/6. (iii) Multiple of 3 (3,6,9,12): 3→2, 6→5, 9→4, 12→1 = 12. P = 12/36 = 1/3.

Common Mistakes Students Make in Probability — Class 10 Maths

Mistake 1:

Wrong: Students count only one order for consecutive days — e.g., only (T,W) but not (W,T).

Why it's wrong: Both orderings are distinct outcomes since the problem distinguishes between Shyam and Ekta.

Correct approach: Always count both (A,B) and (B,A) for consecutive pairs. Total consecutive pairs = 8, not 4.

Mistake 2:

Wrong: In Q2, students count only 5 outcomes for sum=6 (confusing with a standard die).

Why it's wrong: This die has faces 1,2,2,3,3,6 — two faces show 3. So (3,3) appears 4 times (2×2 combinations), not 1.

Correct approach: Always use the actual face values and draw the full 6×6 table.

Mistake 3:

Wrong: In Q4, students set up the equation as x+6/18 = 2 × x+6/12 (using wrong numerator for original probability).

Why it's wrong: The original probability uses x black balls out of 12, not x+6.

Correct approach: P_1 = x/12 and P_2 = x+6/18. Set $P_2 = 2P_1$.

Mistake 4:

Wrong: Students forget to subtract green marbles from total in Q5 — they write "16 blue marbles" instead of 8.

Why it's wrong: 2/3 × 24 = 16 gives green marbles, not blue.

Correct approach: Blue = Total − Green = 24 − 16 = 8.

Mistake 5:

Wrong: Writing probability as a value greater than 1 (e.g., P = 15/12).

Why it's wrong: Probability always satisfies 0 ≤ P(E) ≤ 1. A value above 1 means an arithmetic error.

Correct approach: Always check your final answer is between 0 and 1.

Exam Tips for CBSE 2026-27 — Chapter 15 Probability

- **Show the sample space:** For any question involving two events (two people, two dice), always write the total number of outcomes explicitly. CBSE examiners award 1 mark just for correctly stating the sample space size.
- **Draw the table for dice problems:** In Q2-type questions, drawing the full sum table in your answer sheet earns method marks even if your final answer has a small error.
- **Use complementary events:** For "different days" or "not getting X" type questions, use $P(\bar{E}) = 1 - P(E)$. It is faster and less error-prone than listing all favourable outcomes.
- **Verify algebraic answers:** In Q3, Q4, Q5-type questions, always substitute your value of x back to verify. CBSE 2026-27 marking scheme awards 1 mark for verification in 3-mark questions.
- **Probability chapter weightage:** In the CBSE 2026-27 Class 10 board exam, the Statistics and Probability unit carries approximately 11 marks. Probability alone typically contributes 4–5 marks — enough to make a difference in your final score.
- **Last-minute revision checklist:** (a) Know the basic formula. (b) Practice building sample spaces for 2-event experiments. (c) Revise complementary event formula. (d) Solve Q3, Q4, Q5 algebraic setups at least twice. (e) Memorise: probability is always between 0 and 1.

Key Points to Remember — Probability Exercise 15.2

- Probability of an event E: P(E) = (Favourable outcomes)/(Total outcomes)
- For two independent choices from n options: total outcomes = n × n = n^2
- Complementary event: $P(\bar{E}) = 1 - P(E)$ — use this for "not" and "different" questions
- A special die with repeated faces changes the probability distribution — always build the full outcome table
- Algebraic probability: express unknowns as x, write probability fractions, form equation from given condition, solve and verify

- Range rule: 0 ≤ P(E) ≤ 1 always — use this as a self-check
- "At least" means ≥ — count all outcomes equal to or greater than the given value

For more practice, explore our sibling pages: [NCERT Solutions Class 10 Maths Chapter 15 Exercise 15.1](#), [NCERT Solutions Class 10 Maths Chapter 14 Statistics](#), and [NCERT Solutions Class 10 Maths Chapter 13 Surface Areas and Volumes](#).

Frequently Asked Questions — NCERT Class 10 Maths Chapter 15 Ex 15.2

How many questions are there in NCERT Class 10 Maths Chapter 15 Exercise 15.2?

NCERT Class 10 Maths Chapter 15 Exercise 15.2 contains exactly 5 questions. These range from sample space problems (Q1 — shop visit days), special dice problems (Q2), to algebraic probability setups (Q3, Q4, Q5 involving bags, boxes, and jars). All 5 questions are fully solved on this page with step-by-step working for your CBSE 2026-27 exam preparation.

What is the probability that both Shyam and Ekta visit the shop on consecutive days?

The shop is open Tuesday to Saturday — 5 days. Total outcomes = 5 × 5 = 25. Consecutive day pairs (considering both orders) are: (T,W), (W,T), (W,Th), (Th,W), (Th,F), (F,Th), (F,Sa), (Sa,F) = 8 pairs. Therefore P(consecutive days) = 8/25. Many students get 4/25 by forgetting to count both orderings — that is the most common error in this question.

How do you find the number of blue balls when the probability of blue is double that of red?

Let blue balls = x. Total = 5 + x. P(blue) = x/(5+x) and P(red) = 5/(5+x). Set P(blue) = 2 × P(red): x/(5+x) = 10/(5+x). Multiply both sides by (5+x) to get x = 10. So there are 10 blue balls. Verify: P(blue) = 10/15 = 2/3 and P(red) = 5/15 = 1/3. Since 2/3 = 2 × 1/3, the answer is confirmed.

Is NCERT Class 10 Maths Chapter 15 Exercise 15.2 important for CBSE board exams 2026-27?

Yes, Exercise 15.2 is very important for the CBSE 2026-27 board exam. The Probability chapter is part of the Statistics and Probability unit which carries around 11 marks in total. Questions similar to Q3, Q4, and Q5 — where you set up algebraic equations using probability conditions — appear regularly in board papers. Practise all 5 questions and focus on showing clear step-by-step working.

How many blue marbles are in a jar of 24 if the probability of drawing a green marble is 2/3?

Total marbles = 24. P(green) = 2/3. Number of green marbles = (2/3) × 24 = 16. Number of blue marbles = 24 − 16 = 8. A common mistake is to write 16 as the answer for blue marbles — remember that 2/3 gives you the green count, not blue. Always subtract from the total to find the remaining colour.

What is the probability that the total score on a special die (faces 1,2,2,3,3,6) thrown twice is at least

Total outcomes = 6 × 6 = 36. Build the complete sum table. Outcomes with sum ≥ 6: sums of 6 (4 times), 7 (2 times), 8 (5 times), 9 (4 times), 12 (1 time) = 15 outcomes. P(total ≥ 6) = 15/36 = 5/12. Always draw the full table in your answer sheet — examiners award marks for the table even if the count has a minor error.