

Probability - NCERT Examples

Examples 1-13 with independently verified solutions.

CHAPTER
Probability

RESOURCE
NCERT Examples

SOURCE
NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

coin · head · tail

Find the probability of getting a head when a fair coin is tossed once. Also find the probability of getting a tail.

Solution

Board-exam working:

The equally likely outcomes are Head (H) and Tail (T).

$$S = \{H, T\}, \quad n(S) = 2$$

For the event of getting a head, there is one favourable outcome.

$$P(H) = \frac{n(H)}{n(S)} = \frac{1}{2}$$

For the event of getting a tail, there is also one favourable outcome.

$$P(T) = \frac{n(T)}{n(S)} = \frac{1}{2}$$

Final answer

$$P(H) = \frac{1}{2}, \quad P(T) = \frac{1}{2}$$

NCERT EXAMPLE

Example 2

coloured balls · elementary events

A bag contains one red ball, one blue ball and one yellow ball, all of the same size. Kritika draws one ball without looking. Find the probability of drawing (i) the yellow ball, (ii) the red ball and (iii) the blue ball.

Solution

Board-exam working:

The three balls are equally likely to be selected.

$$S = \{Y, R, B\}, \quad n(S) = 3$$

Each required event has exactly one favourable outcome.

$$P(Y) = \frac{1}{3}$$

$$P(R) = \frac{1}{3}$$

$$P(B) = \frac{1}{3}$$

Final answer

$$P(Y) = P(R) = P(B) = \frac{1}{3}$$

NCERT EXAMPLE

Example 3

die · complementary events

A fair die is thrown once. Find the probability of getting (i) a number greater than 4 and (ii) a number less than or equal to 4.

Solution

Board-exam working:

$$S = \{1, 2, 3, 4, 5, 6\}, \quad n(S) = 6$$

(i) Numbers greater than 4 are 5 and 6.

$$E = \{5, 6\}, \quad n(E) = 2$$

$$P(E) = \frac{2}{6} = \frac{1}{3}$$

(ii) Numbers less than or equal to 4 are 1, 2, 3 and 4.

$$F = \{1, 2, 3, 4\}, \quad n(F) = 4$$

$$P(F) = \frac{4}{6} = \frac{2}{3}$$

Final answer

$$(i) \frac{1}{3} \quad (ii) \frac{2}{3}$$

NCERT EXAMPLE

Example 4

playing cards · ace · complement

One card is drawn from a well-shuffled deck of 52 cards. Find the probability that it will (i) be an ace and (ii) not be an ace.

Solution

Board-exam working:

A deck has 52 cards and 4 aces.

(i) Number of favourable outcomes for drawing an ace = 4.

$$P(\text{ace}) = \frac{4}{52} = \frac{1}{13}$$

(ii) Number of cards that are not aces:

$$52 - 4 = 48$$

$$P(\text{not an ace}) = \frac{48}{52} = \frac{12}{13}$$

Check using complementary events:

$$1 - P(\text{ace}) = 1 - \frac{1}{13} = \frac{12}{13}$$

Final answer

$$(i) \frac{1}{13} \quad (ii) \frac{12}{13}$$

NCERT EXAMPLE

Example 5

complementary events · tennis

Sangeeta and Reshma play a tennis match. The probability that Sangeeta wins is 0.62. Find the probability that Reshma wins.

Solution

Board-exam working:

Exactly one of the two players wins, so their winning events are complementary.

$$P(R) = 1 - P(S)$$

$$P(R) = 1 - 0.62 = 0.38$$

Final answer

$$P(\text{Reshma wins}) = 0.38$$

NCERT EXAMPLE

Example 6

birthdays · complementary events

Savita and Hamida are friends. Ignoring a leap year, find the probability that both have (i) different birthdays and (ii) the same birthday.

Solution

Board-exam working:

Fix Savita's birthday. Hamida's birthday can be any one of 365 equally likely days.

(i) To have a different birthday, Hamida can be born on any of the other days.

$$365 - 1 = 364$$

$$P(\text{different birthdays}) = \frac{364}{365}$$

(ii) The same-birthday event is the complement of the different-birthday event.

$$P(\text{same birthday}) = 1 - \frac{364}{365} = \frac{1}{365}$$

Final answer

(i) $\frac{364}{365}$	(ii) $\frac{1}{365}$
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NCERT EXAMPLE

Example 7

student selection · girl · boy

A class has 40 students: 25 girls and 15 boys. One student's name card is drawn at random. Find the probability that the selected name is (i) a girl's and (ii) a boy's.

Solution

Board-exam working:

Total equally likely name cards = 40

(i) There are 25 favourable cards bearing girls' names.

$$P(\text{girl}) = \frac{25}{40} = \frac{5}{8}$$

(ii) There are 15 favourable cards bearing boys' names.

$$P(\text{boy}) = \frac{15}{40} = \frac{3}{8}$$

The probabilities add to 1, as expected.

$$\frac{5}{8} + \frac{3}{8} = 1$$

Final answer

(i) $\frac{5}{8}$	(ii) $\frac{3}{8}$
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NCERT EXAMPLE

Example 8

marbles · colours

A box contains 3 blue, 2 white and 4 red marbles. One marble is drawn at random. Find the probability that it is (i) white, (ii) blue and (iii) red.

Solution

Board-exam working:

Total number of marbles:

$$3 + 2 + 4 = 9$$

(i) There are 2 white marbles.

$$P(W) = \frac{2}{9}$$

(ii) There are 3 blue marbles.

$$P(B) = \frac{3}{9} = \frac{1}{3}$$

(iii) There are 4 red marbles.

$$P(R) = \frac{4}{9}$$

Final answer

$$(i) \frac{2}{9} \quad (ii) \frac{1}{3} \quad (iii) \frac{4}{9}$$

NCERT EXAMPLE

Example 9

two coins · at least one head

Harpreet tosses two different coins simultaneously. Find the probability that she gets at least one head.

Solution

Board-exam working:

Write H for head and T for tail. Because the coins are different, HT and TH are distinct outcomes.

$$S = \{HH, HT, TH, TT\}, \quad n(S) = 4$$

The outcomes containing at least one head are HH, HT and TH.

$$E = \{HH, HT, TH\}, \quad n(E) = 3$$

$$P(E) = \frac{3}{4}$$

The same result follows by subtracting the probability of no head.

$$P(E) = 1 - P(TT) = 1 - \frac{1}{4} = \frac{3}{4}$$

Final answer

$$P(\text{at least one head}) = \frac{3}{4}$$

NCERT EXAMPLE

Example 10

geometrical probability · number line · time interval

In a musical-chair game, the music may stop at any time within 2 minutes after it begins. Find the probability that it stops within the first half-minute.

NCERT marks this example as not from the examination point of view.



Fig. 14.1

Figure 14-1 from the supplied NCERT chapter.

Solution

Board-exam working:

All stopping times from 0 to 2 minutes are equally likely along the interval.

Total interval length = 2 minutes

Favourable interval length = $\frac{1}{2}$ minute

$$P(E) = \frac{\text{favourable length}}{\text{total length}}$$

$$P(E) = \frac{\frac{1}{2}}{2} = \frac{1}{4}$$

Final answer

$$P(E) = \frac{1}{4}$$

NCERT EXAMPLE

Example 11

geometrical probability · area · lake

A missing helicopter is equally likely to have crashed anywhere in the rectangular region shown. Find the probability that it crashed inside the lake.

NCERT marks this example as not from the examination point of view.

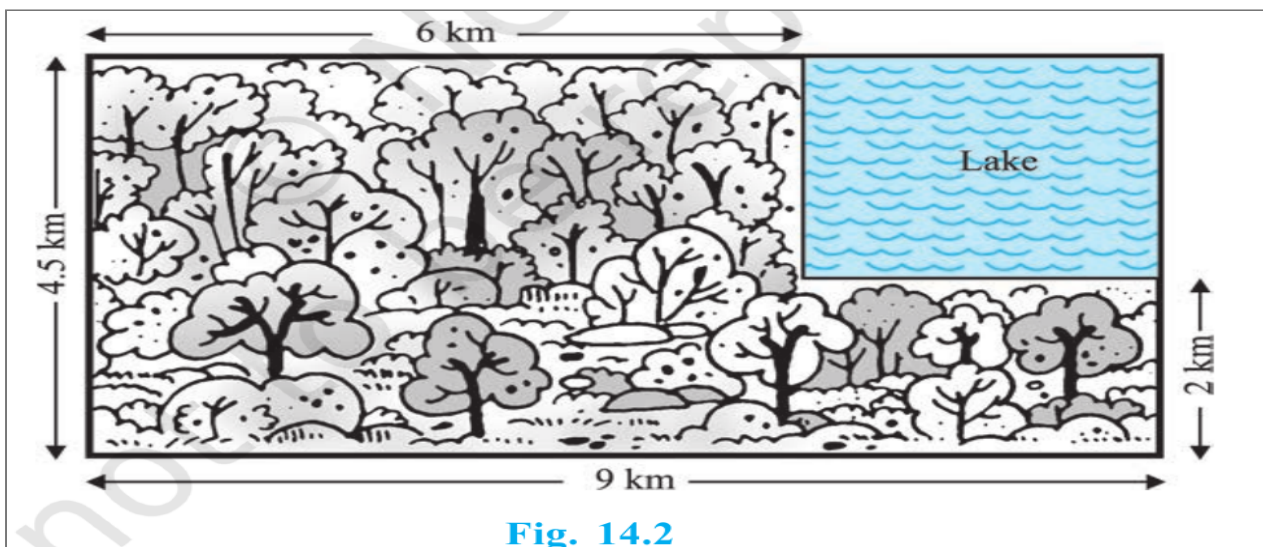


Fig. 14.2

Figure 14-2 from the supplied NCERT chapter.

Solution

Board-exam working:

Area of the complete search region:

$$A_R = 9 \times 4.5 = 40.5 \text{ km}^2$$

From the labelled dimensions, the lake is 3 km wide and 2.5 km high.

$$\text{Lake width} = 9 - 6 = 3 \text{ km}$$

$$\text{Lake height} = 4.5 - 2 = 2.5 \text{ km}$$

$$A_L = 3 \times 2.5 = 7.5 \text{ km}^2$$

$$P(\text{inside lake}) = \frac{A_L}{A_R} = \frac{7.5}{40.5}$$

$$= \frac{75}{405} = \frac{5}{27}$$

Final answer

$$P(\text{inside lake}) = \frac{5}{27}$$

NCERT EXAMPLE

Example 12

shirts · defects · acceptance

A carton has 100 shirts: 88 good, 8 with minor defects and 4 with major defects. Jimmy accepts only good shirts; Sujatha rejects only shirts with major defects. One shirt is drawn at random. Find the probability that it is acceptable to (i) Jimmy and (ii) Sujatha.

Solution

Board-exam working:

Total shirts = 100

(i) Jimmy accepts only the 88 good shirts.

$$P(\text{acceptable to Jimmy}) = \frac{88}{100} = 0.88$$

(ii) Sujatha accepts good shirts and shirts with minor defects.

$$88 + 8 = 96$$

$$P(\text{acceptable to Sujatha}) = \frac{96}{100} = 0.96$$

Final answer

(i) 0.88	(ii) 0.96
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NCERT EXAMPLE

Example 13

two dice · sample space · sum

A blue die and a grey die are thrown together. Write all possible outcomes and find the probability that the sum of the top numbers is (i) 8, (ii) 13 and (iii) less than or equal to 12.

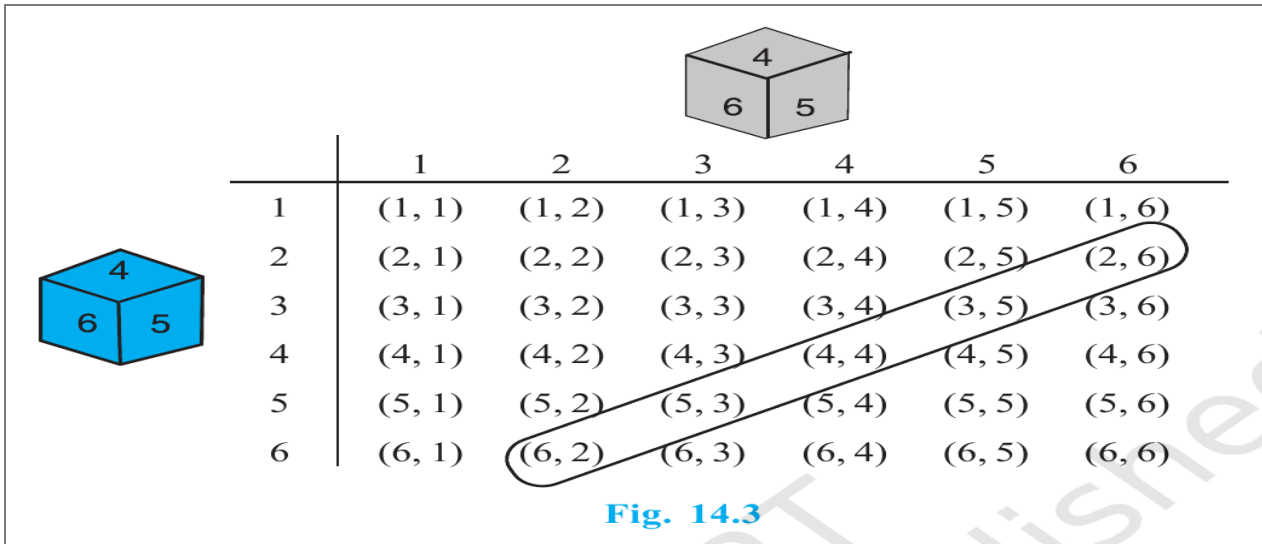


Figure 14-3 from the supplied NCERT chapter.

Solution

Board-exam working:

The ordered pair records (blue die, grey die). The 6×6 table gives 36 equally likely outcomes.

$$n(S) = 6 \times 6 = 36$$

(i) Outcomes whose sum is 8:

$$E = \{(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)\}$$

$$P(E) = \frac{5}{36}$$

(ii) The largest possible sum is 12, so a sum of 13 is impossible.

$$P(\text{sum } 13) = \frac{0}{36} = 0$$

(iii) Every outcome has sum at most 12.

$$P(\text{sum} \leq 12) = \frac{36}{36} = 1$$

Final answer

(i) $\frac{5}{36}$	(ii) 0	(iii) 1
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