



# MATHS

## NCERT - NCERT

## MATHEMATICS(HINGLISH)

## PROBABILITY

### Exercise 15 1

1. Refer to Q.2, Exercise 14.2. What is the empirical probability that an engineer lives:(i)

less than 7 km from her place of work?(ii) more than or equal to 7 km from her place of work?  
(iii) within  $\frac{1}{2}$  km from her place of work?



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2. Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes:

Outcome	3 heads	2 heads	1 head	No head
Frequency	23	72	77	28

If the three coins are simultaneously tossed

again, compute the probability of 2 heads coming up

A.  $\frac{16}{25}$

B.  $\frac{7}{25}$

C.  $\frac{8}{25}$

D.  $\frac{9}{25}$

**Answer: D**



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3. An organization selected 2400 families at random and surveyed them to determine a relationship between income level and the number of vehicles in a family. The information gathered is listed in the table below:

Monthly income (in Rs)	Vehicles per family			
	0	1	2	Above 2
Less than 7000	10	160	25	0
7000 – 10000	0	305	27	2
10000 – 13000	1	535	29	1
13000 – 16000	2	469	59	25
16000 or more	1	579	82	88

Suppose a family is chosen. Find the probability that the family chosen is (i) earning Rs 10000 – 13000 per month and owning exactly 2 vehicles. (ii) earning Rs 16000

or more per month and owning exactly 1 vehicle. (iii) earning less than Rs 7000 per month and does not own any vehicle. (iv) earning Rs 13000 – 16000 per month and owning more than 2 vehicles. (v) owning not more than 1 vehicle



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**4. Refer to Table 14.7, Chapter 14**

(i) Find the probability that a student obtained less than 20% in the mathematics

test.

(ii) Find the probability that a student obtained marks 60 or above.

Marks	Number of students
0 - 20	7
20 - 30	10
30 - 40	10
40 - 50	20
50 - 60	20
60 - 70	15
70 - above	8
<b>Total</b>	<b>90</b>



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5. To know the opinion of the students about the subject statistics, a survey of 200 students

was conducted. The data is recorded in the following table.



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**6.** In a cricket match, a bats woman hits a boundary 6 times out of 30 balls she plays. Find the probability that she did not hit a boundary.

A. 0.2

B. 0.4

C. 0.6

D. 0.8

**Answer: D**



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7. 1500 families with 2 children were selected randomly, and the following data were recorded:

Number of girls in a family	2	1	0
Number of families	475	814	211

Compute the probability of a family, chosen at



random, having

(i) 2 girls

(ii) 1 girl

(iii) No girl

Also check whether the sum of these probabilities is 1



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**8.** Refer to Example 5, Section 14.4, Chapter 14.

Find the probability that a student of the class was born in August.



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9. In Q.1, Exercise 14.2, you were asked to prepare a frequency distribution table regarding the blood groups of 30 students of a class. Use this table to determine the probability that a student of this class, selected at random, has blood group AB.

A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O,  
A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O.



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**10.** Eleven bags of wheat flour, each marked 5 kg, actually contained the following weights of flour (in kg): 4.97, 5.05, 5.08, 5.03, 5.00, 5.06, 5.08, 4.98, 5.04, 5.07, 5.00. Find the probability that any of these bags chosen at random contains more than 5 kg of flour.



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**Solved Examples**

1. Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardized conditions favorable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows

Table 15.11

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	41

What is the probability of germination of

(i) more than 40 seeds in a bag?

(ii) 49 seeds in a bag?

(iii) more than 35 seeds in a bag?





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2. A die is thrown 1000 times with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given in the following table :

<i>Outcome</i>	1	2	3	4	5	6
<i>Frequency</i>	17	91	50	157	149	175

Find the probability of getting each outcome.



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3. Two coins are tossed simultaneously 500 times, and we get  
Two heads : 105 times  
One

head : 275 times  
No head : 120 times  
Find the probability of occurrence of each of these events.



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4. A coin is tossed 1000 times with the following frequencies: Head : 455, Tail : 545  
Compute the probability for each event.



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5. The percentage of marks obtained by a student in the monthly unit tests are given below. Based on this data, find the probability that the student gets more



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6. A tyre manufacturing company kept a record of the distance covered before a tyre needed to be replaced. The table shows the results of 1000 cases.

Table 15.8

Distance (in km)	less than 4000	4000 to 9000	9001 to 14000	more than 14000
Frequency	20	210	325	445

If you buy a tyre of this company, what is the probability that :

(i) it will need to be replaced before it has covered 4000 km?

(ii) it will last more than 9000 km?

(iii) it will need to be replaced after it has covered somewhere between 4000 km and 14000 km?



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7. The record of a weather station shows that out of the past 250 consecutive days, its weather forecasts were correct 175 times.

(i) What is the probability that on a given day it was correct?

(ii) What is the probability that it was not correct on a given day?



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8. On one page of a telephone directory, there were 200 telephone numbers. The frequency distribution of their unit place digit (for example, in the number 25828573, the unit place digit is 3) is given in Table:

Digit	0	1	2	3	4	5	6	7	8	9
Frequency	22	26	22	22	20	10	14	28	16	20

Without looking at the page, the pencil is placed on one of the numbers i.e the number is chosen at random. What is the probability that the digit in its unit place is 6?



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9. Consider the frequency distribution table (Table 14.3, Example 4, Chapter 14), which gives the weights of 38 students of a class. (i) Find the probability that the weight of a student in the class lies in the interval 46-50 kg. (ii) Give two events in this context, one having probability 0 and the other having probability 1.



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**10.** An insurance company selected 2000 drivers at random (i.e., without any preference of one driver over another) in a particular city to find a relationship between age and accidents. The data obtained are given in the following table:

Age of drivers (in years)	Accidents in one year				
	0	1	2	3	over 3
18 - 29	440	160	110	61	35
30 - 50	505	125	60	22	18
Above 50	360	45	35	15	9

Find the probabilities of the following events for a driver chosen at random from the city:

(i) being 18-29 years of age and having exactly

3 accidents in one year.

(ii) being 30-50 years of age and having one or more accidents in a year.

(iii) having no accidents in one year



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