



NCERT solutions for class-9 maths Probability Ex 15.1

1. In a cricket match a batsman hits a boundary 6 times out of 30 balls he plays. Find the probability that he will

(i) hit a boundary in the next ball.

(ii) not hit boundary in the next ball.

**Ans:** For all solutions, Probability =

Favourable outcomes

Total outcomes

(i) Number of times on boundary is hit = 6

$$\therefore P(\text{hit a boundary}) = \frac{6}{30} = \frac{1}{5}$$

(ii) Number of times on boundary is not hit = 30  
- 6 = 24

$$\therefore P(\text{did not hit a boundary}) = \frac{24}{30} = \frac{4}{5}$$

**Q2.** 1500 families with 2 children were selected randomly and the following data were recorded:

No. of girls in a family	No. of families
2	475
1	814
0	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.

**Ans: (i)** Total number of families = 1500

No. of families having 2 girls = 475

$$\therefore P(\text{Family having 2 girls}) = \frac{475}{1500} = \frac{19}{60}$$

(ii) No of families having 1 girl = 814

$$\therefore P(\text{Family having 1 girl}) = \frac{814}{1500} = \frac{407}{750}$$

(iii) No. of families having no girl = 211

$$\therefore P(\text{Family having no girl}) = \frac{211}{1500}$$

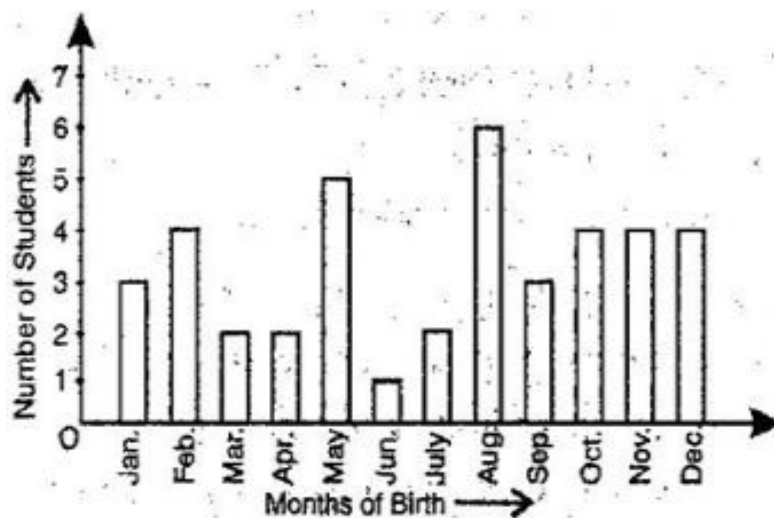
**Check:** Sum of all probabilities

**Checking:** Sum of all probabilities =

$$\frac{19}{60} + \frac{407}{750} + \frac{211}{1500} \\ = \frac{475 + 814 + 211}{1500} = \frac{1500}{1500} = 1$$

Yes, the sum of probabilities is 1.

**Q3.** In a particular section of Class IX, 40 students were asked about the months of their birth and the following graph was prepared for the data so obtained:



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

**Ans:** From the bar graph, we observe,

Total no. of students of Class IX = 40

No. of students of Class IX born in August = 6

$$\therefore P(\text{A student born in August}) = \frac{6}{40} = \frac{3}{20} = 0.15$$

**Q4.** Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes:

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

If the three coins are simultaneously tossed again, compute the probability of 2 heads coming up.

**Ans:** No. of 2 heads = 72



Total number of outcomes =  $23 + 72 + 77 + 28 = 200$

$$\therefore P(2 \text{ heads}) = \frac{72}{200} = \frac{9}{25}$$

**Q5.** 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) not more than 1 vehicle.

**Ans:** (i)  $P(\text{earning Rs. 10000 – 13000 per month and owning exactly 2 vehicles}) = \frac{29}{2400}$

(ii)  $P(\text{earning Rs. 16000 or more per month and owning exactly 1 vehicles}) = \frac{579}{2400}$

(iii)  $P(\text{earning Rs. 7000 per month and does not own any vehicles}) = \frac{10}{2400} = \frac{1}{240}$

(iv)  $P(\text{earning Rs. 13000 – 16000 per month and owning more than 2 vehicles}) = \frac{25}{2400} = \frac{1}{96}$

(v) P (owning not more than 1 vehicle) =

$$\frac{2062}{2400} = \frac{1031}{1200}$$

**Q6.** A teacher analyses the performance of two sections of students in a mathematics test of 100 marks given in the following table:

Marks	No. of students
0 – 20	7
20 – 30	10
30 – 40	10
40 – 50	20
50 – 60	20
60 – 70	15
70 and above	8
Total	90

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

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

**Ans: (i)** No. of students obtaining marks less than 20 out of 100, i.e. 20% = 7

Total students in the class = 90

$$\therefore P(\text{A student obtained less than 20\%}) = \frac{7}{90}$$

**(ii)** No. of students obtaining marks 60 or above = 15 + 8 = 23

$$\therefore P(\text{A student obtained marks 60 or above}) = \frac{23}{90}$$

**Q7.** 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:

Opinion	No. of students
likes	135
dislikes	65

Find the probability that a student chosen at random:

(i) likes statistics (ii) dislikes it.

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