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 = $\frac{\text{Favourable outcomes}}{\text{Total outcomes}}$

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

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

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

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

(ii) No of families having 1 girl = 814

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

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

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

Checking: Sum of all probabilities

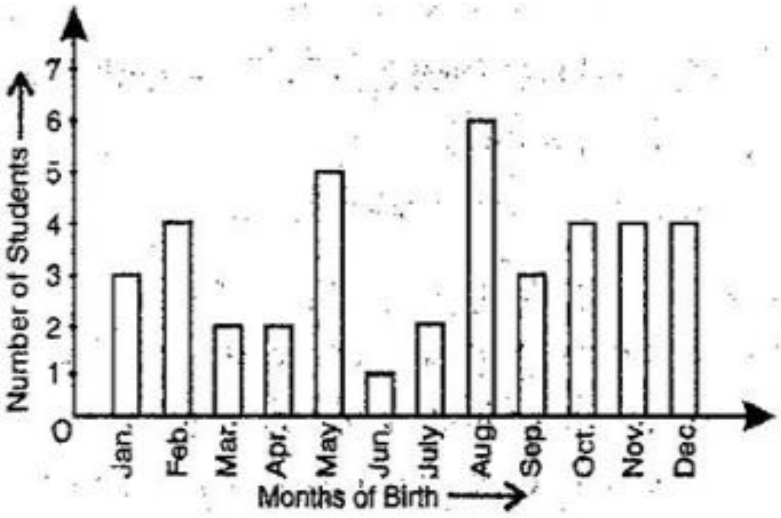
Checking: Sum of all probabilities =

$$\frac{19}{60}+\frac{407}{750}+\frac{211}{1500}$$

$$=\frac{475+814+211}{1500}=\frac{1500}{1500}=1$$

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 (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 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 (earning Rs. 10000 – 13000 per month and owning exactly 2 vehicles) = $\frac{29}{2400}$

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

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

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

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

$\therefore$ P (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.

********** END **********