

EXERCISE - 15.1

1. Here, the total number of trials = 30
 Number of times, the ball touched boundary = 6
 \therefore Number of times, the ball missed the boundary
 $= 30 - 6 = 24$

$P(\text{not hitting the boundary})$

$$\begin{aligned} & \frac{\text{No. of times the batswoman did not hit the boundary}}{\text{Total number of balls she played}} \\ &= \frac{24}{30} = \frac{4}{5} = 0.8 \end{aligned}$$

2. Total number of families = 1500.
 (i) Number of families having 2 girls = 475
 \therefore Probability that the family, chosen at random, have

$$2 \text{ girls} = \frac{475}{1500} = \frac{19}{60}$$

- (ii) Number of families having 1 girl = 814
 \therefore Probability that the family chosen at random, have

$$1 \text{ girl} = \frac{814}{1500} = \frac{407}{750}$$

- (iii) Number of families having no girl = 211
 \therefore Probability that the family, chosen at random, have
 no girl = $\frac{211}{1500}$

Now, the sum of the obtained probabilities

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

i.e., sum of the above probabilities is 1.

3. From the graph, we have
 Total number of students, born in various months = 40
 Number of students born in August = 6
 \therefore Probability that a student was born in August
 $= \frac{6}{40} = \frac{3}{20}$

4. Total number of times the three coins are tossed = 200
 Number of times 2 heads comes up = 72

$$\therefore \text{Probability of 2 heads coming up} = \frac{72}{200} = \frac{9}{25}$$

5. Here, total number of families = 2400
 (i) Number of families earning

₹ 10000-13000 per month and owning exactly 2 vehicles = 29

\therefore Probability that the family is earning ₹ 10000-13000 and owning exactly 2 vehicles = $\frac{29}{2400}$

(ii) Number of families earning ₹ 16000 or more per month and owning exactly 1 vehicle = 579

\therefore Probability that the family is earning ₹ 16000 or more and owning exactly 1 vehicle = $\frac{579}{2400}$

(iii) Number of families earning less than ₹ 7000 per month and does not own any vehicle = 10

\therefore Probability that the family is earning less than ₹ 7000 and owning no vehicle = $\frac{10}{2400} = \frac{1}{240}$

(iv) Number of families earning ₹ 13000-16000 per month and owning more than 2 vehicles = 25

\therefore Probability that the family is earning ₹ 13000-16000 and owning more than 2 vehicles = $\frac{25}{2400} = \frac{1}{96}$

(v) Number of families owning not more than 1 vehicle = [Number of families having no vehicle] + [Number of families having only 1 vehicle]
 $= [10 + 1 + 2 + 1] + [160 + 305 + 535 + 469 + 579]$
 $= 14 + 2048 = 2062$

\therefore Probability that the family is owning not more than 1 vehicle = $\frac{2062}{2400} = \frac{1031}{1200}$

6. From the table, we have

Total number of students = 90

(i) Number of students who obtained less than 20% marks = 7

\therefore Probability that a student obtained less than 20% marks = $\frac{7}{90}$

(ii) Number of students who obtained marks 60 or above = 15 + 8 = 23

\therefore Probability that a student obtained marks 60 and above = $\frac{23}{90}$.

7. Total number of students in the survey = 200

(i) Number of students who like statistics = 135

∴ Probability that a student, chosen at random, likes statistics = $\frac{135}{200} = \frac{27}{40}$

(ii) Number of students who do not like statistics = 65

∴ Probability that a student, chosen at random, dislikes statistics = $\frac{65}{200} = \frac{13}{40}$

8. Total number of engineers = 40

(i) Number of engineers, living at a distance less than 7 km from their work place = 9

∴ Probability that an engineer, lives at distance less than 7 km from their work place = $\frac{9}{40}$

(ii) Number of engineers, living at a distance more than or equal to 7 km from their work place = 31

∴ Probability that an engineer lives at a distance more than or equal to 7 km from their work place = $\frac{31}{40}$

(iii) Number of engineers living within $\frac{1}{2}$ km from their work place = 0

∴ Probability that an engineer lives within $\frac{1}{2}$ km from their work place = $\frac{0}{40} = 0$

9. It is an activity. Do it yourself.

10. It is a class room activity for students. Do it yourself.

11. Total number of bags = 11

Number of bags having more than 5 kg of flour = 7

∴ Probability that a bag contain more than 5 kg of flour = $\frac{7}{11}$

12.

Concentration of sulphur dioxide (in ppm)	Tally Marks	Frequency
0.00 - 0.04		4
0.04 - 0.08		9
0.08 - 0.12		9
0.12 - 0.16		2
0.16 - 0.20		4
0.20 - 0.24		2
Total		30

Total number of days = 30

Number of days on which sulphur dioxide concentration is in the interval 0.12 - 0.16 = 2

∴ Probability that concentration of sulphur dioxide on a day, chosen at random, is in interval 0.12 - 0.16 = $\frac{2}{30} = \frac{1}{15}$

13.

Blood groups	Tally Marks	Number of Students
A		9
B		6
O		12
AB		3
Total		30

Total number of students = 30

Number of students having blood group AB = 3

∴ Probability that a student, selected at random, has blood group AB = $\frac{3}{30} = \frac{1}{10}$

