MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

PROBABILITY

Others

1. 1000 families with 2 children were selected randomly and the following data were recorded.

Number of boys in a family	0	1	2
Number of families	140	560	300

If a family is chosen at random, find the probability that it has

(i) no boy

(ii) one boy

(iii) two boys

(iv) at least one boy

(v) at most one boy.

2. The record of a weather station shows that out of the past 250 consecutive days, its weather forecast were correct 175 times. What is the probability that on a given day (i) it was correct? (ii) it was not correct?

3. A dice is thrown 1000 times with the following frequencies for outcomes 1,2,3,4,5 and 6 as given below: Outcomes:　1　　　　2　　　3　　　　　　4　　　5　　　　　6 Frequency:　179　　　150　　　157　　　　　149　　175　　　190 Find the probability of happening of each outcome.

4. In a cricket match, a batsman hits a boundary 8 times out of 40 balls he plays. Find the probability that he didn't hit a boundary.

A. $\dfrac{4}{5}$

B. $\dfrac{1}{5}$

C. $\dfrac{3}{5}$

D. $\dfrac{2}{5}$

Answer: A

5. 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 Find the probability of getting: (i) three heads (ii) two heads and one tail (iii) at least two heads

6. Two coins are tossed simultaneously 1000 times with the following frequencies of different outcomes:

Two heads: 210 times

One head: 550 times

No head: 240 times

Find the probability of occurrence of each of these events.

▶ **Watch Video Solution**

7. A coin is tossed 500 times with the following frequencies of two outcomes:

head: 240 times, tail: 260 times.

Find the probability of occurrence of each of these events.

▶ **Watch Video Solution**

8. Following frequency distribution given the weights of 38 students of a class: Weight in Kg: 31-35 36-40, 41-45, 46-50, 51-55, 56-60 61-65, 66-70 71-

75 No. of students 9 5 14 3 1 2 2 1 1 Find the probability that weight of a student in the class is: (i)at most 60 kg (ii)at least 36 kg (iii)not more than 50kg. Also define two events in this context, one having probability 0 and the other having probability 1.

9. Given below is the frequency distribution table regarding the concentration of sulphur dioxide in the air in parts per million of a certain city for 30 days. Concentration 0.00-0.04 0.04-0.08 0.08-0.12 0.12-0.16 0.16-0.20 0.20-0.24 No. of days: 4 8 9 2 4 3 Find the probability of concentration of sulphur dioxide in the interval 0.12-0.16 on any of these days.

10. The blood groups of 30 students of class IX are recorded as follows: 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 A student is selected at random from the class from blood donation. Find

the probability that the blood group of the student chosen is:

(i) A   (ii) B   (iii) AB   (iv) O

11. 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: Find the probabilities of the following events for a driver chosen at random from the city: (i) The driver being in the age group 18–29 years and having exactly 3 accidents in one year. (ii) The driver being in the age group of 30–50 year and having one or more accidents in a year. (iii) The number of drivers having no accidents in one year

12. A company selected 2400 families at random and survey them to determine a relationship between income level and the number of

vehicles in a home. The information gathered is listed in the table below:

If a family is chosen, find the probability that the family 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 vehicle. (v) owning not more than 1 vehicle. (vi) owning at least one vehicle.

▶ Watch Video Solution

13. To know the opinion of the students about Mathematics, a survey of 200 students was conducted. The data is recorded in the following table:

Find the probability that a student chosen at random (i) likes Mathematics (ii) does not like it.

▶ Watch Video Solution

14. opp side of ||gm are equal

15. 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 the table below: A number is chosen at random, find the probability that the digit at its unit's place is: (i) 6 (ii) a non-zero multiple of 3 (iii) a non-zero even number (iv) an odd number.

16. Show that the opposite sides of a parallelogram are equal.

17. Given below is the frequency distribution of wages: A worker is selected at random. Find the probability that his wages are: (i) less than

Rs. 150 (ii) at least Rs. 210 (iii) more than or equal to 150 but less than Rs. 210.

18. The distances (in km) of 40 female engineers from their residence to their place of work were found as follows: 5 19 7 12 3 10 9 14 10 12 7 2 20 17 8 9 25 18 3 6 11 11 5 15 13 32 12 15 7 17 15 7 12 16 18 6 31 2 3 2 Find the probability that an engineer lives: (i) less than 7 km from her place of work? (ii) at least 7 km from her place of work? (iii) within $\frac{1}{2}$ km from her place of work (iv) at most 15km from her place of work?

19. A tyre manufacturing company kept a record of the distance covered before a tyre to be replaced. Following table shows the results of 1000 cases. Distance in km: Less tan 400 400 to 900 900 to 1400 More than 1400 Number of tyres: 210 325 385 80 If you buy a tyre of this

company, what is the probability that: (i) it will need to be replaced before it has covered 400 km? (ii) it will last more than 900 km? (iii) it will need to be replaced after it has covered somewhere between 400 km and 1400 km? (iv) it will not need to be replaced at all? (v) it will need to be replaced?

20. Three coins are tossed simultaneously 100 times the following frequencies of different outcomes: Outcomes: No head   One head   Two heads   Three head Frequency: 14

38   36   12 If the three coins are simultaneously tossed again, compute the probability of: (i) 2 heads coming up. (ii) 3 heads coming up. (iii) at least one head coming up. (iv) getting more heads than tails. (v) getting more tails than heads.

21. Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows: (Bag - Number of seeds germinated) 1-40 2-48 3-40 4-35 5-45 what is the probability of germination of more than 40 seeds in a bag?

▶ Watch Video Solution

22. A coin is tossed 500 times with the following frequencies of two outcomes: Head: 240 times. tail: 260 times. Find the probability of occurrence of each of these events.

▶ Watch Video Solution

23. Two coins are tossed simultaneous 1000 times with the following frequencies of different outcomes: Two heads: 210 times One head: 550

times No head :   240 times Find the probability of occurrence of each of these events.

24. 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 Find the probability of getting: (i) three heads (ii) two heads and one tail (iii) at least two heads

25. In a cricket match, a batsman hits a boundary 8 times out of 40 balls he plays. Find the probability that he didn't hit a boundary.

26. A die is thrown 1000 times with the following frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given below: $Outcome:$ 1 2 3 4 5 6 $Frequency:$ 179 150 157 149 175 190 Find the probability of happening of each outcome.

27. The record of a weather station shows that out of the past 250 consecutive days, its weather forecast were correct 175 times. What is the probability that on a given day (i) it was correct? (ii) it was not correct?

28. 1000 families with 2 children were selected randomly, and the following data were recorded: $Number\ of\ boys \in a\ family:$ 0 1 2 $Number\ of\ families:$ 140 560 300 If a family is chosen at random, find the probability that it has (i) No boy (ii) one boy (iii) 2 boys (iv) at least one boy (v) at most one boy

29. The percentage of marks obtained by a student in the monthly unit tests are given below: $Unit\ test:$ I II III IV V $Percentage\ of\ marks\ obtained:$ 58 74 76 62 85 Find the probability that the student gets: (i) a first class i.e. at least 60% marks (ii) marks between 70% and 80% (iii) a distinction i.e. 75% or above (iv) less than 65% marks.

30. 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 the table below: A number is chosen at random, find the probability that the digit at its unit's place is: (i) 6 (ii) a non-zero multiple of 3 (iii) a non-zero even number (iv) an odd number.

31. A tyre manufacturing company kept a record of the distance covered before a tyre to be replaced. Following table shows the results of 1000 cases. $Distance \in km:$ $Less\ than\ 400$ $400 \rightarrow 900$ $900 \rightarrow 1400$ $M\ or\ e\ than\ 1400$ $N \odot\ of\ tyres:$ $210\ 325\ 385\ 80$ If you buy a tyre of this company, what is the probability that: it will need to be replaced before it has covered 400 km? it will last more than 900 km? it will need to be replaced after it has covered somewhere between 400km and 1400 km? it will not need to be replaced at all it will need to be replaced?

> ▶ **Watch Video Solution**

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

Bag	1	2	3	4	5
No. 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 (iv)at least 40 seeds in a bag? (v)at most 40 seeds in a bag?

33. The distances (in km) of 30 female engineers from their residence to their place of work were found as follows: 5 3 10 20 25 11 13 7 12 31 19 10 12 17 18 11 32 17 16 2 12 14 2 9 6 15 15 7 6 2 Find the probability that an engineer lives: (i) less than 7 km from her place of work? (ii) at least 7km from her place of work? (iii) within $\frac{1}{2}km$ from her place of work? (iv) at most 15km from her place of work?

34. Following table shows the marks scored by a group of 90 students in a mathematics test of 100 marks. Marks 0-20 20-30 30-40 40-50 50-60 60-70 70-100 No. of Students: 7 10 10 20 20 15 8 Find the probability that

marks scored by a student in the class is: at most 60 marks   (ii) at least 60 marks (iii)not more than 50 marks

35. An insurance company selected 2000 drivers at random in a particular city to find a relationship between age and accidents. The obtained are given in the following table: Age of Drivers (in years) Accidents in one year 0 1 2 3 over 3 18-29 30-50 above 50 440 505 360 160 125 45 110 60 35 61 22 15 35 18 9 Find the probability of the following events for a driver chosen at random from the life 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.

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

37. Two coins are tossed simultaneously 500 times with the following frequencies of different outcomes: Two heads: 95 times One tail : 290 times No head: 115 times Find the probability of occurrence of each of these events.

38. Three coins are tossed simultaneously 100 times with the following frequencies of different outcomes:

$Outcome:$	$No head$	$One head$	$Two heads$	$Three Head$
$Frequency:$	14	38	36	12

If the three coins are simultaneously tossed again, compute the probability of:

(i)2 heads coming up.   (ii) 3 heads coming up. (iii)at least one head coming up. (iv)getting more heads than tails. (v)getting more tails than heads

39. 1500 families with 2 children were selected randomly and the following data were recorded: No. of girls in a family 0 1 2 No. of families: 211 814 475 If a family is chosen at random, compute the probability that it has: (i) No girl (ii) 1 girl (iii) 2 girls (iv) at most one girl

▶ Watch Video Solution

40. In a cricket match, a batsman hits a boundary 6 times out of 30 balls he plays. Find the probability that on a ball played: he hits boundary (ii) he does not hit a boundary.

▶ Watch Video Solution

41. The percentage of marks obtained by a student in monthly unit tests are given below: Unit I II III IV V Percentage of marks obtained 69 71 73 68 76 Find the probability that the student gets: (i) more than 70% marks (ii) less than 70% marks (iii) a distinction

42. To know the opinion of the students about Mathematics, a survey of 200 students was conducted. The data is recorded in the following table:

Opinion: Like Dislike No. of students 135 65 Find the probability that a student chosen at random (i) like Mathematics (ii) does not like it.

43. The blood groups of 30 students of class IX are recorded as follows: 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 A student is selected at random from the class from blood donation. Find the probability that the blood group of the student chosen is:

(i) A   (ii) B   (iii) AB   (iv) O

44. Eleven bags of wheat flour, each marked 5kg, 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.

> ▶ **Watch Video Solution**

45. Following table shows the birth month of 40 students of class IX

Jan.	Feb.	March	April	May	Ju $\neq$	Jy	Aug.	Sept.	Oct.	N
3	4	2	2	5	1	2	5	3	4	4

Find the probability that a student was born in August.

> ▶ **Watch Video Solution**

46. Given below is the frequency distribution table regarding the concentration of sulphur dioxide in the air in parts per million of a certain city for 30 days.

Concentration	0.00 – 0.04	0.04 – 0.08	0.08 – 0.12	0.12 – 0.16	0.16 –
No. of days:	4	8	9	2	4

Find the probability of concentration of sulphur dioxide in the interval 0.12-0.16 on any of these days.

47. A company selected 2400 families at random and survey them to determine a relationship between income level and the number of vehicles in a home. 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 29 25 16000 or more 1 579 82 88 If a family is chosen, find the probability that the family is: earning Rs. 10000-13000 per month and owning exactly 2 vehicles. earning Rs. 16000 or more per month and owning exactly 1 vehicles. Earning less than Rs. 7000 per month and does not own any vehicle. Earning Rs. 13000-16000 per month and owning more than 2 vehicle. owning not more than 1 vehicle owning at least one vehicle.

48. The following table gives the life time of 400 neon lamps: Life time (in hours 300-400 400-500 500-600 600-700 700-800 800-900 900-1000 No. of lamps: 14 56 60 86 74 62 48 A bulb is selected at random. Find the probability that the life time of the selected bulb is : (i)less than 400 (ii)between 300 to 800 hours (iii)at least 700 hours.

▶ Watch Video Solution

49. Given below is the frequency distribution of wages (in Rs.) of 30 workers in a certain factory:

Wages (In Rs.)	$110 - 130$	$130 - 150$	$150 - 170$	$170 - 190$	$190 - 210$
No. of workers	3	4	5	6	5

A worker is selected at random. Find the probability that his wages are:

(i)less than Rs. 150 (ii) at least Rs. 210 (iii)more than or equal to 150 but less than Rs. 210

▶ Watch Video Solution

50. Define a trial.

51. Define an elementary event.

52. Define an event

53. Define probability of an event.

54. A bag contains 4 white balls and some red balls. If the probability of drawing a white ball from the bag is $\dfrac{2}{5}$, find the number of red balls in the bag.

55. A die is thrown 200 times. If the probability of getting an even number is $\frac{2}{5}$. How many times an odd number is obtained?

56. Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes: Outcomes 3 heads 2 heads 1 head No head Frequency 23 72 77 28 Find the probability of getting at most two heads.

57. Two coins are tossed simultaneously. What is the probability of getting at least one heads?

58. The probability of an impossible event is (a)1   (b) 0 (c) less than 0 (d) greater than 1

59. The probability of a certain event is (a)0   (b) 1   (c) greater than 1   (d) less than 0

60. The probability an event of a trial is (a)1   (b) 0   (c) less than 1 (d) more than 1

61. Which of the following cannot be the probability of an event? $\frac{1}{3}$ (b) $\frac{3}{5}$ (c) $\frac{5}{3}$ (d) 1

62. Two coins are tossed simultaneously. The probability of getting atmost one head is

A. $\dfrac{1}{4}$

B. $\dfrac{3}{4}$

C. $\dfrac{1}{2}$

D. $\dfrac{1}{4}$

Answer: B

63. A coin is tossed 1000 times, if the probability of getting a tail is $\dfrac{3}{8}$, how many times head is obtained?

A. 525

B. 375

C. 625

D. 725

Answer: C

64. A dice is rolled 600 times and the occurrence of the outcomes 1, 2, 3, 4, 5 and 6 are given below: Outcome 1 2 3 4 5 6 Frequency 200 30 120 100 50 100 The probability of getting a prime number is

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. $\dfrac{49}{60}$

D. $\dfrac{39}{125}$

Answer: A

65. The percentage of attendance of different classes in a year in a school is given below: Class: X IX VIII VII VI V Attendance: 30 62 85 92 76 55 What is the probability that the class attendance is more than 75%?

(a) $\dfrac{1}{6}$

(b) $\dfrac{1}{3}$

(c) $\dfrac{5}{6}$

(d) $\dfrac{1}{2}$

A. $\dfrac{1}{6}$

B. $\dfrac{1}{3}$

C. $\dfrac{5}{6}$

D. $\dfrac{1}{2}$

Answer: D

66. A bag contains 50 coins and each coin is marked from 51 to 100. One coin is picked at random. The probability that the number on the coin is not a prime number, is

(a) $\dfrac{1}{5}$

(b) $\dfrac{3}{5}$

(c) $\dfrac{2}{5}$

(d) $\dfrac{4}{5}$

    A. $\dfrac{1}{5}$

    B. $\dfrac{3}{5}$

    C. $\dfrac{2}{5}$

    D. $\dfrac{4}{5}$

Answer: D

▶ Watch Video Solution

67. In a football match, Ronaldo makes 4 goals from 10 penalty kicks. The probability of converting a penalty kick into a goal by Ronaldo, is

A. $\dfrac{1}{4}$

B. $\dfrac{1}{6}$

C. $\dfrac{1}{3}$

D. $\dfrac{2}{5}$

Answer: D

▶ **Watch Video Solution**