MATHS

BOOKS - AGRAWAL PUBLICATION

STATISTICS AND PROBABILITY

Example

1. Find the class marks of the classes 20-25 and 35-60.

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2. Two dice are thrown simultaneously. What is the probability that the product of the number appearing on the top is 1?

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3. When we toss a coin, there are two possible outcomes-heads or tails. Therefore, the probability of each outcome is $\frac{1}{2}$. Justify your answer.

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4. The mean of 20 observations is 12. if each observation is increased by 5, then find the new mean.

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5. A letter is choosen from the letters of the word MAINTENANCE. What is the probability that it is N?

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6. What is the probability that a randomly taken leap year has 52 Sundays?

7. A number is selected at random from natural numbers 1 to 20. find the probability that the selected numbre is a prime number?

8. A number is choosen at random from the number -3, -2, -1, 0, 1, 2, 3.What will be the probability that square of this number is less than or equal to 1?

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9. If two different coins are tossed together, than find the probability of getting two heads.

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10. A letter of the English alphabet is chosen at random. Find the probability that the chosen letter is a letter of the word 'Trignometry'.

11. 20 ticket, on which number 1 to 20 are written, are mixed throughly and then a ticket is drawn at random out of them. Find the probability that the number on the drawn ticket is a multiple of 3 or 7.

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12. Cards marked with number 3, 4, 5.....50 are placed in a box and mixed throughly. A card is drawn at randomo from the box. Find the probability that the selected card bears a perfect square number.

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13. Will the median class and modal class of grouped data always be different? Justify your answer.

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14. If a family having three children, there may be no girl, one girl, two girls or three girls. So, the probability of each is $\frac{1}{4}$. Is this correct? Justify your answer.

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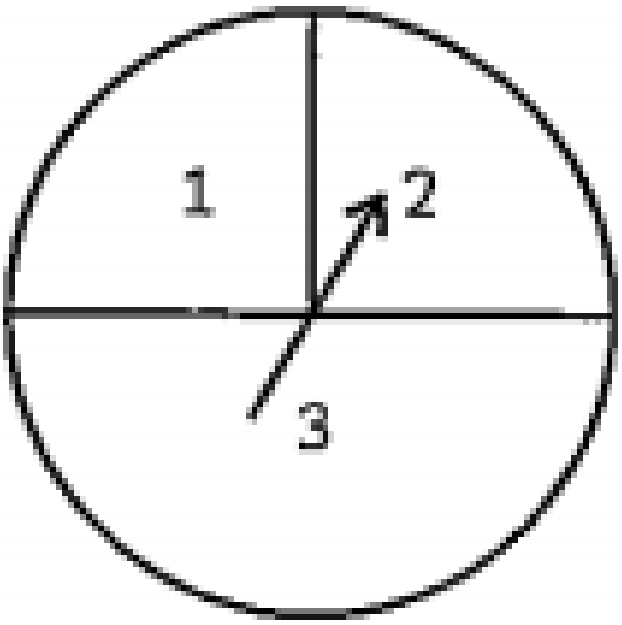
15. A game consists of spinning an arrow which comes to rest pointing at one of the three regions (1,2 or 3) (see figure). Are the outcomes 1,2 or 3 equally likely to occur?Give reasons.



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16. Find the mode of the following distribution:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Number of Students	4	6	7	12	5	6

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17. Find the mode of the following distribution:

Classes	0-20	20-40	40-60	60-80	80-100
Frequency	10	8	12	16	4

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18. If toss three coins together. The possible outcomes are no heads, 1 head, 2 heads and 3 heads. So, I say that the probability of no heads is $\frac{1}{4}$. What is wrong with this conclusion?

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19. A bag contains slips numbered from 1 to 100. if Fatima choose a slip at random from

the bag, it will either be an odd number or an even number. Since this situation has only two possible outcomes, so the probability of each is $\frac{1}{2}$. Justify.

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20. A Group Housing Society has 600 members, who have their houses in the campus and decided to hold a Tree Plantation Drive on the occation of New year. Each household was given the choice of planting a

samplings of its choice. The number of different types of saplings planted were.

Neem - 125

Peepal- 165

Creepers-50

Fruit plants-150

Flowering plants-110

On the opening ceremony. one of the plants is selected randomly for a prize. after reading the above passage, answer the following questions:

What is the probability that the selected plant

is:

A fruit plant or a flowering plant?

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21. A Group Housing Society has 600 members, who have their houses in the campus and decided to hold a Tree Plantation Drive on the occation of New year. Each household was given the choice of planting a samplings of its choice. The number of different types of saplings planted were.

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On the opening ceremony. one of the plants is selected randomly for a prize. after reading the above passage, answer the following questions:

What is the probability that the selected plant is:

Either a Neem plant or a Peepal plant?

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22. If X,M and Z are denoting mean, median and mode of a data and X : M = 9: 8, then the ratio M : Z is?

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23. Find the mean of the following distributions:

Class	3-5	5-7	7-9	9-11	11-13
Frequency	5	10	10	7	8

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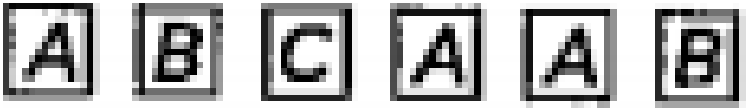
24. A child has a die whose 6 faces show the letters given below:



The die is thrown once. What is the probability of getting

A

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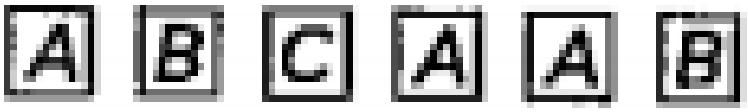
25. A child has a die whose 6 faces show the letters given below:



The die is thrown once. What is the probability of getting

B?

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26. A card is drawn at random from a pack 52 playing cards. Find the probability of drawing

a card which is neither a spade nor a king?

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27. A die is thrown once. Find the probability of getting a number which (A) is a prime number (B) lies between 2 or 6.

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28. 20 cards from 11 to 30, are put in a box and mixed throughly. A card is then drawn from

the box at random. Find the probability that the number on the drawn card is a prime number.

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29. Find the probability that in the leap year there will be 53 Tuesdays.

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30. Two different dice are thrown together. Find the probability that the product of the numbers appeared is less than 18.

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31. 15 cards numbered from 1 to 15 are put in a box and mixed throughly. Then, a card is drawn at random from the box. Find the probability that the number on the drawn card is divisible by 2 or 3.

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32. An integar is choosen between 70 and 100, find the probability that it is a prime number.

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33. An integar is choosen between 70 and 100, find the probability that it is divisible by 7.

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34. Two different dice are tossed together. Find the probability:

of getting a doublet.

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35. Two different dice are tossed together. Find the probability:

of getting a sum 10, of the numbers on the two dice.

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36. An integer is chosen at random between 1 and 100. find the probability that it is:

divisible by 8.

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37. An integer is chosen at random between 1 and 100. Find the probability that it is :

not divisible by 8

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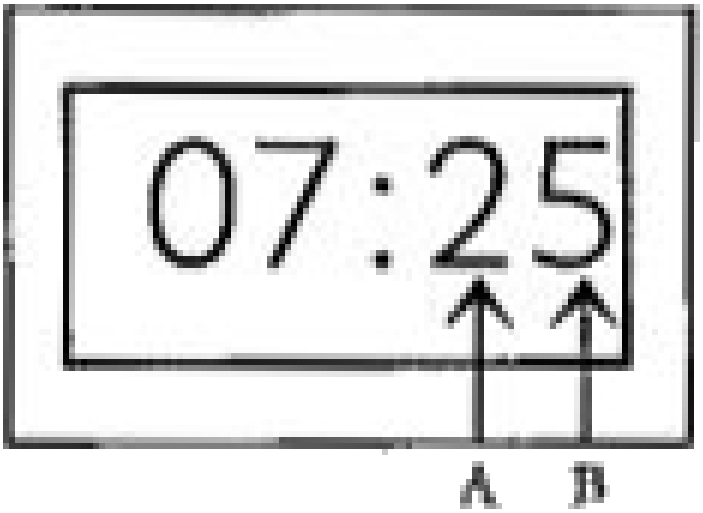
38. Amrish wakes up in the morning and notices that his digital cock recde 07: 25 am. After noon, he looks at the clock again.

What is the probability that

the number in column A is 4 ?



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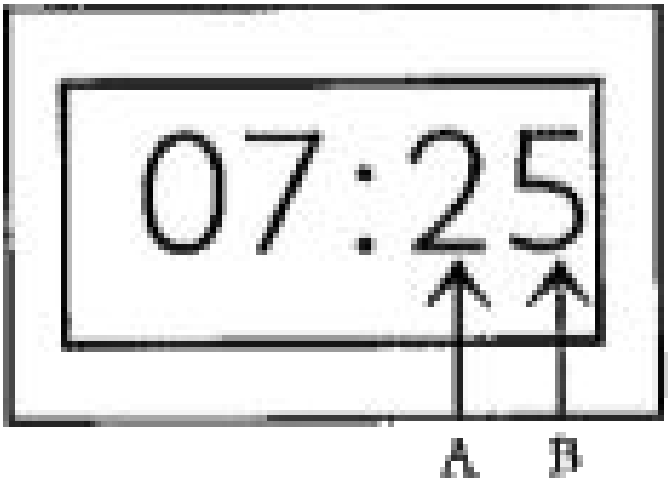
39. Amrish wakes up in the morning and notices that his digital cock recde 07: 25 am. After noon, he looks at the clock again.

What is the probability that

the number in column B is 8 ?



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40. A die is thrown twice. Find the probability that:

5 will not come up either time

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41. Cards marked with number 5 to 50 are placed in a box and mixed throughly. Only card is drawn at random from the box. Find the probability that the number on the card taken

out is

a prime number less than 10.

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42. Cards marked with number 5 to 50 are placed in a box and mixed throughly. Only card is drawn at random from the box. Find the probability that the number on the card taken out is

a number which is a perfect square.

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43. Find the mean of the distribution:

Class	1-3	3-5	5-7	7-10
Frequency	9	22	27	17

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44. Two dice are thrown at the same time. Find the probability of getting the same number on both dice.

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45. Two dice are thrown at the same time. Find the probability of getting different numbers on both dice.

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46. A coin is tossed two times. Find the probability of getting at most one head.

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47. Two dices were rolled once. Find the probability of gettiing such numbers on the two dice, whose product is 12.

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48. Apoorv throws two dice at once and computers the product of the numbers appearing on the dice. Peehu throws one die and squares the number that appears on it.

Who has a better chance of getting the number 36. why?

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49. From the following distribution, find the median:

Classes	500 – 600	600 – 700	700 – 800	800 – 900	900 – 1000
Frequency	36	32	32	20	30

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50. The probability of selecting a blue marble at random form a jar that contains only blue, black and green marbles is $\frac{1}{5}$. The probability of selecting a black marble at random from the same jar is $\frac{1}{4}$ If the jar contains 11 green marbles, find the total number of marbles in the jar.

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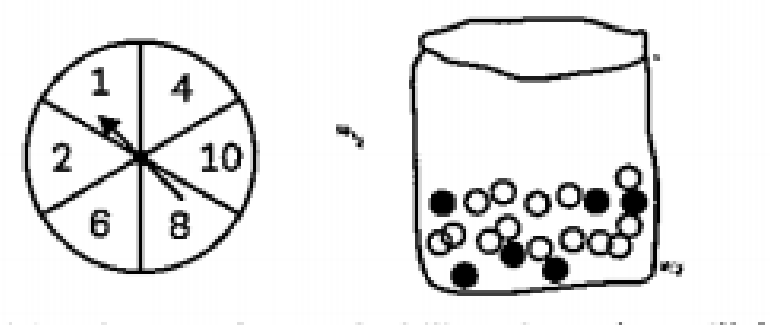
51. Read the following passage and answer the questions given at the end:

Diwali Fair

A game in a both at a Diwali fair involves using a spinner first. Then, if the spinner stops on an even number, the player is allowed to pick a marble from a bag. The spinner and the marbles in the bag are represented in the figure.

Prizes are given when a black marble is picked.

Shweta plays the game once.



What is the probability that she will be allowed to pick a marble from the bag?

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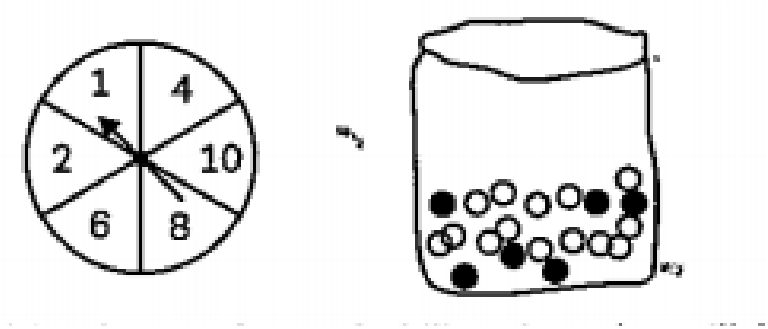
52. Read the following passage and answer the questions given at the end:

Diwali Fair

A game in a both at a Diwali fair involves using

a spinner first. Then, if the spinner stops on an even number, the player is allowed to pick a marble from a bag. The spinner and the marbles in the bag are represented in the figure.

Prizes are given when a black marble is picked. Shweta plays the game once.



Suppose she is allowed to pick a marble from the bag, what is the probability of getting a

prize, when it is given that the bag contains 20 balls out of which 6 are black?

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53. Calculate the mode of the following distribution:

Class	10-15	15-20	20-25	25-30	30-35
Frequency	4	7	20	8	1

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54. Calculate the mean of the following data:

Class	4-7	8-11	12-15	16-19
Frequency	5	4	9	10

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55. The following table gives the number of pages written by Sarika for completing her own book for 30 days:

Number of pages written per day	16-18	19-21	22-24	25-27	28-30
Number of Days	1	3	4	9	13

Calculate the average number of pages writen in 30 days.

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56. Find the mode of the following frequency distribution:

Class	Frequency
0-10	8
10-20	10
20-30	10
30-40	16
40-50	12
50-60	6
60-70	7

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57. All kings, jacks and diamonds have been removed from a pack of playing cards and the remaining cards are well-shuffled. A card is then drawn at random. Find the probability that the drawn card is a

face card.

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58. All kings, jacks and diamonds have been removed from a pack of playing cards and the remaining cards are well-shuffled. A card is

then drawn at random. Find the probability that the drawn card is a

black card.

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59. The daily income of a sample of 50 employees are tabulated as follows:

Income (in ₹)	1-200	201-400	401-600	601-800
Number of employees	14	15	17	7

Find the mean daily income of the employees.

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60. A bag contains 12 balls out of which some are white and the others are red. If the probability of drawing a white ball at random from the bag is $\frac{2}{3}$, then find how many red balls of there in the bag.

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61. An aircraft has 120 passenger seats. The number of seats occupied during 100 flights is given in the following table:

Numbe of seats	100-104	104-108	108-112	112-116	116-120
Frequency	15	20	32	18	15

Determine the mean number of seats occupied during the flights.

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62. A game consists of tossing a one-rupee coin 3 times and noting the outcome each time. Ramesh wins the game if all the tosses give the same result (i.e. three heads or three tails) and looses otherwise. Find the probability of Ramesh losing the game.

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63. Two different dice are thrown together. Find the probability that the numbers obtained.

have a sum less than 7

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64. Two different dice are thrown together. Find the probability that the numbers obtained.

have a product less than 6.

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65. Two different dice are thrown together. Find the probability that the numbers obtained.

is a doublet of odd numbers.

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66. A lot consists 144 balls pens of which 20 are defective. The customers will buy a ball

pen if its is good, but will not buy a defective ball pen. The shopkeeper draws one pen at random from the lot and gives it to the customers. What is the probability that customer will buy the ball pen.

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67. A lot consists 144 balls pens of which 20 are defective. The customers will buy a ball pen if its is good, but will not buy a defective ball pen. The shopkeeper draws one pen at

random from the lot and gives it to the customers. What is the probability that customer will not buy the ball pen.

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68. The weights (in kg) of 50 wrestlers are recorded in the following table:

Weight (in kg)	100-110	110-120	120-130	130-140	140-150
Number of wrestlesr	4	14	21	8	3

Find the mean weight of the wrestlers.

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69. A coin is tossed 3 times. Write all the possible outcomes. Find the probability of getting at least 2 heads.

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70. Black aces and black queens are removed from a pack of 52 cards. The remaining cards are reshuffled and then a card is drawn. Find the probability of getting:

a black card.

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71. Black aces and black queens are removed from a pack of 52 cards. The remaining cards are reshuffled and then a card is drawn. Find the probability of getting:

an ace.

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72. In a single throw of a pair of different dice, what is the probability of getting (A) a prime

number on each dice (B) a total of 9 or 11?

73. A carton of 24 bulbs contain 6 defective bulbs. One bulb is drawn at random. What is the probability that bulb is not defective?if the bulb selected is defective and it is not replaced and a second bulb is selected at random from the rest, what is the probability that the second bulb is defective?

74. At a fete, cards bearing numbers o1 to 1000, (one number on one card, are put in a box. Each player selects one card at random and that card is not replaced. If the selected card has a perfect square greater than 500, the player wins a prize. What is the probability that:

the first player wins a prize?

 Watch Video Solution

75. At a fete, cards bearing numbers o1 to 1000, (one number on one card, are put in a box. Each player selects one card at random and that card is not replaced. If the selected card has a perfect square greater than 500, the player wins a prize. What is the probability that:

the second player wins a prize, if the first has won?

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76. The table below shows the salaries of 280 persons:

Salary (In thousand ₹)	No. of Persons	Salary (In thousand ₹)	No. of Persons
5–10	49	30–35	7
10–15	133	35–40	4
15–20	63	40–45	2
20–25	15	45–50	1
25–30	6		

Calculate the median salary of the data.

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77. A bag contains 15 white and some black balls. If the probability of drawing a black ball from the bag is thrice that of drawing a white ball, find the number of black balls in the bag.

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78. From a pack of 52 playing cards, jacks, Queens and Kings of red colour are removed. From the remaining a card is drawn at random. Find the probability that drawn card is:

a black King.

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79. From a pack of 52 playing cards, jacks, Queens and Kings of red colour are removed. From the remaining a card is drawn at random. Find the probability that drawn card is:

a card of red colour

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80. From a pack of 52 playing cards, jacks, Queens and Kings of red colour are removed.

From the remaining a card is drawn at random. Find the probability that drawn card is:

a card of black colour.

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81. Two unbiased coins are tossed simultaneously then the probability of getting no head is $\frac{A}{B}$, then $(A+B)^2$ is?

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82. If odds in agianst of an event be 3 : 8, then the probability of occurrence of this event is?

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83. The probability of selecting a red ball at random from a jar that contains only red, blue and orange balls is $\frac{1}{4}$ The probability of selecting a blue ball at random from the same jar is $\frac{1}{3}$ If the jar contains 10 orange balls, find the total number of balls in the jar.

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84. The following table gives the number of participants in a yoga camp:

Age (in years)	20-30	30-40	40-50	50-60	60-70
No. of Participants	8	40	58	90	83

Find the modal age of the participants.

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85. Calculate the mean of the following frequency distribution:

Class	10-30	30-50	50-70	70-90	90-110	110-130
Frequency	5	8	12	20	3	2

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86. Two different dice are thrown at the same time. Find the probability that the number appearing on the two dice

Have a sum 8.

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87. Two different dice are thrown at the same time. Find the probability that the number

appearing on the two dice

Are first even and second odd.

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88. A box contains 90 discs which are number from 1 to 90 . If one disc is drawn at random form the box, find the probility that it bears:

(i) a two-digits number

(ii) a numbre divisible by 5.

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89. A box contains 90 discs which are number from 1 to 90 . If one disc is drawn at random form the box, find the probility that it bears:

(i) a two-digits number

(ii) a numbre divisible by 5.

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90. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that

it bears

perfect square number.

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91. Peter throws two different dice together and find the product of the two numbers obtained. Rina thrown a die and squares the number obtained. Who has the better chance to get the number 25.

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92. A die is thrown twice. Find the probability that

5 will not come either time.

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93. A die is thrown twice. Find the probability that

the sum of numbers on the two dice is not more than 5.

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94. A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which to rest pointing to one of the numbers 1,2,3.....8 which are equally likely outcomes. What is the probability that the arrow will point at

an odd number.

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95. A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which to rest pointing to one of the numbers 1,2,3.....8 which are equally likely outcomes. What is the probability that the arrow will point at

a number greater than 3.

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96. A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which to rest pointing to one of the numbers 1,2,3.....8 which are equally likely outcomes. What is the probability that the arrow will point at

a number less than 9.

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97. Two different dice are thrown together. Find the probability that the numbers obtained have:

even sum.

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98. Two different dice are thrown together. Find the probability that the numbers obtained have:

even product.

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99. A number s is selected at random from the numbers 1,2,3 and 4.Another number y is selected at random from the numbers 1,4,9 and 16. Find the probability that product of x and y is less than 16.

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100. A number x is selected from the numbers 1,2,3 and then a second number y is selected

randomly from the numbers 1,4,9. What is the probability that the product xy of the two numbers will be less than 9?

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101. A bage contains 24 balls of which x are red 2x are white and 3x are bule . A ball is selected at random. What is the probability that it is (i) not red (ii)white ?

Watch Video Solution

102. A bage contains 24 balls of which x are red 2x are white and 3x are bule . A ball is selected at random. What is the probability that it is (i) not red (ii)white ?

Watch Video Solution

103. A bag contains 24 balls of which x are red, 2x are white and 3x are blue. A blue is drawn at random. What is the probability that it is: either a blue or a white ball?

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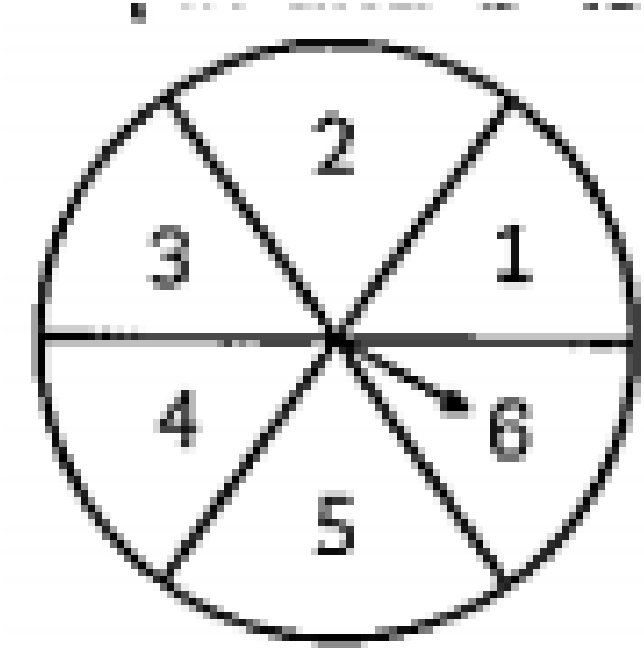
104. In the figure a disc is shown on which a player spins an arrow twice. The fraction $\frac{a}{b}$ is formed, where 'a' is the number of sector on which arrow stops on the first spin and 'b' is the number of the sectore in which he arrow stops on the second spin.On each spin, each sector has equal chance of selection by the arrow. find the probability that the fraction

$\frac{a}{b} > 1.$



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105. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3 respectively. They are thrown and the

sum of the numbrees of them is noted. Find the probability of getting each sum from 2 to 9 separately.

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106. The average score of boys in the examination of a school is 71 and that of the girls is 73. The average score of the school in the examination is 7.18. find the ratio of the number of boys to the number of girls who appeared in the examination.

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107. The mean of the following frequency distribution is 62.8 and the sum of all the frequencies is 50. Compute the missing frequencies f_1 and f_2.

Classes	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	f_1	10	f_2	7	8

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108. The distribution given below show the number of wickets taken by bowlers in one-day

cricket matches, Find the mena and the median for the numbers of wickets taken.

Number of wickets	20 – 60	'60 – 100	100 – 140	140 – 180	180 – 220	220 – 260
Number of Persons	7	5	16	12	2	3

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109. The median of the following data is 525. find the values of x and y, if total frequency is 100.

Class	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Frequency	2	5	x	12	17	20	y	9	7	4

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110. Find the mean marks of the students for the following distribution:

Marks	Number of Students
0 and above	80
10 and above	77
20 and above	72
30 and above	65
40 and above	55
50 and above	43
60 and above	28
70 and above	16
80 and above	10
90 and above	8
100 and above	0

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111. The weight of tea in 70 packets are shown in the following table

Weight (in g)	**Number of packets**
200-201	13
201-202	27
202-203	18
203-204	10
204-205	1
205-206	1

Find the mean weight of packets.

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112. If the median of the following frequency distribution is 32.5. Find the values of f_1 and f_2.

Class	Frequency
0-10	f_1
10-20	5
20-30	9
30-40	12
40-50	f_2
50-60	3
60-70	2
Total	40

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113. The mean of the following distribution is 18. Find the frequency of the class 19-21.

Class	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Frequency	3	6	9	13	f	5	4

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114. From a pack of 52 playing cards. Jacks and Kings of red colour and Queens and Aces of black colour are removed. The remaining cards are mixed and a card is drawn at random. Find

the probability that the drawn card is.

a black Queen.

115. From a pack of 52 playing cards. Jacks and Kings of red colour and Queens and Aces of black colour are removed. The remaining cards are mixed and a card is drawn at random. Find the probability that the drawn card is.

a card of red colour.

116. From a pack of 52 playing cards. Jacks and Kings of red colour and Queens and Aces of black colour are removed. The remaining cards are mixed and a card is drawn at random. Find the probability that the drawn card is.

a jack of black colour.

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117. From a pack of 52 playing cards. Jacks and Kings of red colour and Queens and Aces of

black colour are removed. The remaining cards are mixed and a card is drawn at random. Find the probability that the drawn card is.

a face card.

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118. Daily wages of 110 workers, obtained in a survey, are tabulated below:

Daily Wages (in ₹)	100-120	120-140	140-160	160-180	180-200	200-220	220-240
Number of Workers	10	15	20	22	18	12	13

Compute the mean daily wages and modal daily wages of these workers.

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119. The mena of the following distribution is 18. Find the frequency of the class 19-21.

Class	11-13	13-15	15-17	17-19	17-19	19-21	21-23	23-25
Frequency	3	6	9	13	13	f	5	4

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120. Find the unknown entries a, b, c, d, e, f in the following distribution of the heights of

the students in a class:

Height (in cm)	Frequency	Cumulative Frequency
150-155	12	a
155-160	b	25
160-165	10	c
165-170	d	43
170-175	e	48
175-180	2	f
Total	50	

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121. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is:

a card of spade or an ace.

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122. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is:

a black king.

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123. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is:

neither a jack nor a king.

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124. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is:

either a king or a queen.

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