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| Division | 10th |
| Subject | Mathematics |
| Chapter | Probability |
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| Category | 03 |

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| **A and B throw a pair of dice. If A throws 9, find B’s chance of throwing a higher number**  **(2016)** |
| 1/6 |
| 2/5 |
| 3/7 |
| 1/7 |
| A |
| Total number of events is 62= 36  Probability = |
| possible events  (1,1), (1,2), (1,3), (1,4), (1,5), (1,6),  (2,1), (2,2), (2,3), (2,4), (2,5), (2,6),  (3,1), (3,2), (3,3), (3,4), (3,5), (3,6),  (4,1), (4,2), (4,3), (4,4), (4,5), (4,6),  (5,1), (5,2), (5,3), (5,4), (5,5), (5,6),  (6,1), (6,2), (6,3), (6,4), (6,5), (6,6),  Total number of events is 62= 36  Favourable events, i.e., getting the total of numbers on the dice greater than 9, are  (5,5), (5,6), (6,4), (4,6), (6,5) and (6,6)  Probability =  probability of getting the total of numbers on the dice greater than 9 =6/36 = 1/6 |
| Basic concepts of probability |

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| Ravinder got first chance to roll the dice. What will be the probability of getting the sum of the two numbers appearing on the top face of the dice as  (2019) |
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| A |
| Favourable outcomes are:- |
| The outcomes favourable to are  . Let be the event that 'the sum of numbers is 8 '  The outcomes favourable to are  the number of outcomes favourable to |
| Basic concepts of probability |

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| **Two unbiased dice are thrown. Find the probability that the total of the numbers on the dice is greater than 10**  **(2019)** |
| 1/7 |
| 1/8 |
| 1/11 |
| 1/12 |
| D |
| Probability = |
| Possible events that can occur  (1,1), (1,2), (1,3), (1,4), (1,5), (1,6),  (2,1), (2,2), (2,3), (2,4), (2,5), (2,6),  (3,1), (3,2), (3,3), (3,4), (3,5), (3,6),  (4,1), (4,2), (4,3), (4,4), (4,5), (4,6),  (5,1), (5,2), (5,3), (5,4), (5,5), (5,6),  (6,1), (6,2), (6,3), (6,4), (6,5), (6,6),  Total number of events is 62= 36  Favourable events, i.e., getting the total of numbers on the dice greater than 10, are (5, 6), (6, 5) and (6, 6)  Probability = Number of favourable outcomes/ Total number of outcomes  =3/36 = 1/12 |
| **Types of events** |

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| **A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is either a black card or a king ?**  **(2017)** |
| 6/11 |
| 7/13 |
| 8/10 |
| 9/11 |
| B |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The Total number of black cards is (13 + 13) 26  The total number of kings is 4, of which 2 black kings are also included  So, the total number of black cards or kings will be 26+2 = 28  Probability = Number of favourable outcomes/ Total number of outcomes  Thus, the probability of getting a black card or a king = 28/52 = 7/13 |
| **Types of events** |

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| **A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is neither a heart nor a king ?**  **(2016)** |
| 6/13 |
| 7/13 |
| 8/13 |
| 9/13 |
| D |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| Total number of cards that are a heart and a king = 13 + 3 = 16  Hence, the total number of cards that are neither a heart nor a king = 52 – 16 = 36  Probability = Number of favourable outcomes/ Total number of outcomes  Thus, the probability of getting cards, neither a heart nor a king = 36/52 = 9/13 |
| **Probability of simple events** |

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| **A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is neither an ace nor a king**  **(2015)** |
| 11/10 |
| 11/12 |
| 11/13 |
| 11/15 |
| C |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of ace cards is 4 and the king is 4  The total number of cards that are an ace or a king = 4 + 4 = 8  So, the total number of cards that are neither an ace nor a king is 52 – 8 = 44  Probability = Number of favourable outcomes/ Total number of outcomes  Probability of getting cards which are neither an ace nor a king =44/52 = 11/13 |
| **Probability of simple events** |

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| **A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is neither a red card nor a queen ?**  **(2014)** |
| 3/11 |
| 4/11 |
| 6/13 |
| 7/13 |
| C |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| Total number of queens is 4, in which 2 red queens are also included,  The total number of red cards or queens will be 26 + 2 = 28  So, the total number of cards that are neither a red nor a queen= 52 -28 = 24  Probability = Number of favourable outcomes/ Total number of outcomes  probability of getting neither a red card nor a queen =24/52 = 6/13 |
| **Probability of compound events** |

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| **In a lottery of 50 tickets numbered 1 to 50, one ticket is drawn. Find the probability that the drawn ticket bears a prime number**  **(2018)** |
| 2/11 |
| 3/10 |
| 4/13 |
| 5/14 |
| B |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of tickets is 50  Tickets which are numbered as prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47  The total number of tickets marked as prime is 15  Probability = Number of favourable outcomes/ Total number of outcomes  The probability of getting a prime number on the ticket = 15/50 = 3/10 |
| **Probability of Compound Events** |

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| **A Bag contains 10 red and 8 white balls. One ball is drawn at random. Find the probability that the ball drawn is white**    (2020) |
| 4/9 |
| 5/9 |
| 6/7 |
| 8/9 |
| A |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| Probability that one ball is drawn at random and gets a white ball  The Total number of balls 10 + 8 = 18  The total number of white balls is 8  Probability = Number of favourable outcomes/ Total number of outcomes  The probability of drawing a white ball from bag is 8/18 = 4/9 |
| **Complementary events** |

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| **A bag contains 3 red balls, 5 black balls and 4 white balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is white?**  **(2016)** |
| 1/6 |
| 1/4 |
| 1/5 |
| 1/3 |
| D |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of white balls is 4  The total number of balls 3 + 5 + 4 =12  Probability = Number of favourable outcomes/ Total number of outcomes  Thus, the probability of getting a white ball =4/12 = 1/3 |
| **Complementary Events** |

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| **A bag contains 3 red balls, 5 black balls and 4 white balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is red?**  **(2015)** |
| 1/2 |
| 2/3 |
| 1/5 |
| 1/4 |
| D |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of balls 3+5+4=12  The total number of red balls is 3  Probability = Number of favourable outcomes/ Total number of outcomes  The probability of getting a red ball =3/12 = ¼ |
| Mutually exclusive and non-mutually exclusive events |

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| **What is the probability that a number selected from the numbers 1, 2, 3, …, 15 is a multiple of 4?**  (2015) |
| 1/5 |
| 1/6 |
| 1/7 |
| 1/8 |
| A |
| Numbers that are multiples of 4 are 4, 8 and 12  Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number is between 1 to 15 to 15  Numbers that are multiples of 4 are 4, 8 and 12  Probability = Number of favourable outcomes/ Total number of outcomes  probability of selecting a number which a multiple of 4 is 3/15 = 1/5 |
| Mutually exclusive and non-mutually exclusive events |

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| **A bag contains 6 red, 8 black and 4 white balls. A ball is drawn at random. What is the probability that the ball drawn is not black?**  (2020) |
| 2/7 |
| 3/8 |
| 5/9 |
| 6/7 |
| C |
| The total number of black balls is 8  Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of balls 6+8+4=18  The total number of black balls is 8  So, the total number of balls which are not black is 18–8=10  Probability = Number of favourable outcomes/ Total number of outcomes  probability of drawing a ball which is not black = 10/18 = 5/9 |
| **Multiplication theorem of probability** |

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| **A bag contains 5 white balls and 7 red balls. One ball is drawn at random. What is the probability that the ball drawn is white?**  **(2015)** |
| 6/11 |
| 5/11 |
| 4/13 |
| 3/11 |
| B |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of balls 7+5=12  The total number of white balls is 5  Probability = Number of favourable outcomes/ Total number of outcomes  The probability of getting a white ball= 5/11 |
| **Multiplication theorem of probability** |

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| **Tickets numbered from 1 to 20 are mixed up, and a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 7?**  **(2014)** |
| 2/5 |
| 3/5 |
| 4/5 |
| 1 |
| A |
| cards marked which are multiple of 3 or 7 are 3, 6, 7, 9, 12, 14, 15 and 18  Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of cards is 20  cards marked which are multiple of 3 or 7 are 3, 6, 7, 9, 12, 14, 15 and 18  So, the total number of cards marked multiple of 3 or 7 is 8  Probability = Number of favourable outcomes/ Total number of outcomes  probability of drawing a card that is a multiple of 3 or 7 is 8/20 = 2/5 |
| **Conditional probability** |

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| **In a lottery, there are 10 prizes and 25 blanks. What is the probability of getting a prize?**  **(2013)** |
| 1/7 |
| 2/7 |
| 3/7 |
| 4/7 |
| B |
| The total number of tickets is 10+25=35  Probability = Number of favourable outcomes/ Total number of outcome |
| The total number of tickets is 10 + 25 = 35  The total number of prize-carrying tickets is 10  Probability = Number of favourable outcomes/ Total number of outcomes  Thus, the probability of winning a prize =10/35 = 2/7 |
| **Conditional probability** |

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| **If the probability of winning a game is 0.3, what is the probability of losing it?**  **(2012)** |
| 0.4 |
| 0.05 |
| 0.7 |
| 0.08 |
| C |
| sum of the probability of occurrence of an event and the probability of non-occurrence of an event is 1 |
| sum of the probability of occurrence of an event and the probability of non-occurrence of an event is 1,  the probability of losing the game is:  Probability of losing=1−Probability of winning  Probability of losing=1−0.3  Probability of losing=0.7  So, the probability of losing the game is 0.7 or 70% |
| **Probability distribution** |

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| **A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is red ?**  **(2011)** |
| 4/10 |
| 5/11 |
| 6/13 |
| 7/15 |
| D |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| The total number of red balls is 7  Probability = Number of favourable outcomes/ Total number of outcomes  Thus, the probability of drawing a red ball =7/15 |
| **Probability distribution** |

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| **A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is** **black or white?**  **(2011)** |
| 4/10 |
| 5/11 |
| 6/13 |
| 8/15 |
| D |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| Total number of black or white balls is 5+3=8  Probability = Number of favourable outcomes/ Total number of outcomes  the probability of drawing a white or black ball = 8/15 |
| **Combining dice and card probabilities** |

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| **A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is not black ?**  **(2014)** |
| 1/3 |
| 2/3 |
| 3/5 |
| 4/5 |
| B |
| Probability = Number of favourable outcomes/ Total number of outcomes |
| There are 7 red balls and 3 white balls, so there are 7+3=10 non-black balls  The total number of balls in the bag is 5+7+3=15  Therefore, the probability that the ball drawn is not black is:  Probability=Number of nonblack balls/Total number of balls  =10/15  =2/3 |
| **Combining dice and card probabilities** |