MATHS

BOOKS - MBD MATHS (ODIA ENGLISH)

PROBABILITY

Question Bank

1. A coin tossed twice. Find the probability of getting exactly one head

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2. A coin tossed twice. Find the probability of getting at least one head

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3. A coin tossed twice. Find the probability of getting at most one head

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4. A coin is tossed three times. Find the probability of getting all heads.

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5. A coin is tossed three times. Find the probability of getting at most 2 heads

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6. A coin is tossed three times. Find the probability of getting at least 2 heads

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7. List all possible outcomes when a die is rolled twice or a pair of dice is rolled once. Then find the probability that sum of points is 10

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8. List all possible outcomes when a die is rolled twice or a pair of dice is rolled once. Then find the probability that sum of points is at least 10

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9. List all possible outcomes when a die is rolled twice or a pair of dice is rolled once. Then find the probability that sum of points is at most 10

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10. A die is rolled twice. Find the probability that the result of the first exceeds the result of the second roll by 3

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11. A die is rolled twice. Find the probability that the result of the first exceeds the result of the second roll by at least 3

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12. A die is rolled twice. Find the probability that the result of the first exceeds the result of the second roll by at most 3

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13. A card is selected from 100 cards numbered 1 to 100 cards. If cards is selected at random, find the probability that the number on the card is divisible by 5

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14. A card is selected from 100 cards numbered 1 to 100 cards. If cards is selected at random, find the probability that the number on the card is divisible by 2

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15. A card is selected from 100 cards numbered 1 to 100 cards. If cards is selected at random,

find the probability that the number on the card is divisible by both 2 and 5

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16. A card is selected from 100 cards numbered 1 to 100 cards. If cards is selected at random, find the probability that the number on the card is divisible by either 2 or 5

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17. Eight person stand in a line at random. What is the probability that two person X and Y don't stand together.

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18. What is the probability that four aces appear together when a pack of 52 cards is shuffled completely?

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19. If 8 person are to sit around a table what is the probability that X and Y don't sit together

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20. A die is rolled three times. Find the probability that the numbers obtained are in strictly increasing order.

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21. Three phonorecords are removed from their jackets, played at random. Find the probability that none of the records goes to the right jacket,

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22. Three phonorecords are removed from their jackets, played at random. Find the probability that just one records goes to the right jacket,

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23. Three phonorecords are removed from their jackets, played at random. Find the probability that just two records go to the right jacket,

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24. Three phonorecords are removed from their jackets, played at random. Find the

probability that all three of them go to the right jacket,

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25. Four records are taken out of their jackets, played and returned to the jackets at random. Find the probability that none of the records goes into the right jacket.

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26. Four records are taken out of their jackets, played and returned to the jackets at random. Find the probability that at least one records is put in the right jacket.

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27. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$, Find $P(A \cup B)$

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28. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$,Find $P(A^c)$ and $P(B^c)$

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29. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$,Find $P(A^c \cup B^c)$

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30. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$,Find $P(A^c \cap B^c)$

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31. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$,Find $P(A \cap B^c)$

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32. Let A and B be events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$, Find $P(A^c \cap B)$

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33. Let A and b be events with $P(A) = \frac{1}{3}, P(A \cup B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{4}$, Find P(B)

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34. Let A and b be events with $P(A) = \frac{1}{3}, P(A \cup B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{4}$, Find P(B)

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35. Let A and b be events with $P(A) = \frac{1}{3}, P(A \cup B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{4}$, Find $P(A \cap B^c)$

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36. Let A and b be events with $P(A) = \frac{1}{3}, P(A \cup B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{4}$, Find $P(A \cup B^c)$

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37. There are 20 defective bulbs in a box of 100 bulbs. If 10 balls are chosen at random what is the probability that there are just 3 defective bulbs

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38. There are 20 defective bulbs in a box of 100 bulbs. If 10 balls are chosen at random what is the probability that there are at least 3 defective balls.

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39. A pair of dice is rolled once. Find the probability that the maximum of the two numbers is greater than 4

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40. A pair of dice is rolled once. Find the probability that the maximum of the two numbers is 6

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41. 4 girls and 4 boys sit in a row. Find the probability that the four girls are together

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42. 4 girls and 4 boys sit in a row. Find the probability the boys and girls sit in alternate seats.

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43. A committee of 3 is to be chosen from among 10 people including X and Y. Find the probability that X is the committee

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44. A committee of 3 is to be chosen from among 10 people including X and Y. Find the probability that X or Y belongs the committee

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45. A committee of 3 is to be chosen from among 10 people including X and Y. Find the probability that X and Y belong the committee

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46. A class consists of 25 boys and 15 girls. If a committee of 6 is to be chosen at random, find the probability that all members of the committee are girls

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47. A class consists of 25 boys and 15 girls. If a committee of 6 is to be chosen at random, find the probability that all members of the committee are boys

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48. A class consists of 25 boys and 15 girls. If a committee of 6 is to be chosen at random, find the probability that are exactly 3 boys in the committee


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49. A class consists of 25 boys and 15 girls. If a committee of 6 is to be chosen at random, find

the probability that are exactly 4 girls in the committee

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50. A class consists of 25 boys and 15 girls. If a committee of 6 is to be chosen at random, find the probability there is at least one girl in the committee

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51. There are 20 boys and 10 girls in a class. If a committee of 6 is to be chosen at random having at least 2 boys and 2 girls, find the probability that there are 3 boys in the committee

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52. There are 20 boys and 10 girls in a class. If a committee of 6 is to be chosen at random having at least 2 boys and 2 girls, find the

probability that there are 4 boys in the committee

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53. There are 120 students in a class who have opted for the following MIL. English 20, Oriya 70, Bengali 30. If a student is chosen at random, Find the probability that the student is studying Bengali or English

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54. There are 120 students in a class who have opted for the following MIL. English 20, Oriya 70, Bengali 30. If a student is chosen at random, Find the probability that the student is studying neither Bengali nor English

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55. Sometimes probability of an event A is expressed as follows. We say that odds in favour of A are x to y if $P(A) = \frac{x}{x+y}$. Similarly, we say that odds against A are x to y

if $P(A) = \frac{y}{x+y}$, Find P(A) and $P(A)^c$ if odds in favour of A are 2 to 5

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56. Sometimes probability of an event A is expressed as follows. We say that odds in favour of A are x to y if $P(A) = \frac{x}{x+y}$ similarly, we say that odds against A are x to y if $P(A) = \frac{y}{x+y}$, Find P(A) and $P(A)^c$ if odds against A are 4 to 3

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57. Six dice are rolled. Find the probability that all six faces show different shows different numbers

58. There are 60 tickets in a bag numbered 1 through 60. If a ticket is picked at random, find the probability that the number , on it is divisible by 2 or 5 and is not divisible by any of the numbers 3, 4, 6

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59. Compute $P(A \triangle B)$ in terms of P(A), P(B) and $P(A \cap B)$ where $A \triangle B$ denotes the symmetric difference of A and B.

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60. Three volumes of book and five volumes of another book are placed at random on a book

shelf. Find the probability that all volumes of both the books will be found together.

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61. 2 black cards and 2 red cards are lying face down on a table. If you guess their colours, find the probability that you get none of them right

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62. 2 black cards and 2 red cards are lying face down on a table. If you guess their colours, find the probability that you get two of them right

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63. 2 black cards and 2 red cards are lying face down on a table. If you guess their colours, find the probability that you get all four of them right

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64. A school has six classes 1, 2, 3, 4, 5 and 6 classes 2, 3, 4, 5 and 6 each have the same number of students, but there are twice this number in class 1. If a student is selected at random from the school, What is the probability that he (she)will be in class 1

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65. A school has six classes 1, 2, 3, 4, 5 and 6 classes 2, 3, 4, 5 and 6 each have the same number of students, but there are twice this number in class 1. If a student is selected at random from the school, What is the probability that he (she)will be in class 2

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66. Let a die be weighed in such a way that the probability of getting a number n is

proportional to n

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67. Let a die be weighed in such a way that the probability of getting a number n is proportional to n .Find the probability of each elementary event.

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68. Find the probability of getting an even number in a single roll of the die.

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69. Find the probability of getting a odd number in a single roll of the die

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70. Find the probability of getting a prime number in a single roll of the die

71. Five boys and three girls are playing a chess tournament. All boys have the same probability p of winning the tournament and all the girls have the same probability q of winning. If p= 2q, find the probability that a boy wins the tournament

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72. Five boys and three girls are playing a chess tournament. All boys have the same probability p of winning the tournament and all the girls have the same probability q of winning. If p= 2q, find the probability that a girls wins the tournament

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73. Two balls are drawn from a bag containing 5 white and 7 black balls. Find the probability od selecting 2 white balls if

74. The first ball is replaced before drawing the second.

75. The first ball is not replaced before drawing the second.

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76. Two cards are drawn from a pack of 52 cards, find the probability that

they are of different suits.

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77. Two cards are drawn from a pack of 52 cards, find the probability that

they are of different denomination.

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78. Do both parts of problem 2 if 3 cards drawn at random.

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79. Do both parts of problem 2 if 4 cards are drawn at random.

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80. A lot contains 15 items of which 5 are defective. If three items are drawn at random, find the probability that (i) all three are defective

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81. A lot contains 15 items of which 5 are defective. If three items are drawn at random, find the probability that

none of the three is defective. Do this problem directly.

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82. A pair of dice is thrown. Find the probability of getting a sum of at least 9 if 5 appears on at least one of the dice.

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83. A pair of dice is thrown. If the two numbers appearing are different , find the probability thet

the sum of point is 8.

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84. A pair of dice is thrown. If the two numbers appearing are different , find the probability

thet

the sum of points exceeds 8.

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85. A pair of dice is thrown. If the two numbers appearing are different , find the probability thet

6 appears on one die.

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86. In a class 30% of the student fail in Mathematics,20% of the student fail in English and 10% fail in both. A student is selected at random.

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87. In a class 30% of the student fail in Mathematics,20% of the student fail in English and 10% fail in both.If he has failed in

English, what is the probability thet he has failed in Mathematics?

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88. In a class 30% of the student fail in Mathematics,20% of the student fail in English and 10% fail in bothIf he has failed in Mathematics, what is the probability that he has failed in English

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89. In a class 30% of the student fail in Mathematics,20% of the student fail in English and 10% fail in both.What is the probability that he has failed in both ?

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90. If A,B are two events such that P(A)=0.3, P(B)=0.4,P(AcupB)=0.6 Find

$P(A \mid B)$

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91. If A,B are two events such that P(A)=0.3, P(B)=0.4,P(AcupB)=0.6 Find

P(B | A)

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92. If A,B are two events such that P(A)=0.3, P(B)=0.4,P(AcupB)=0.6 Find

`P(A | B^c)

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93. If A,B are two events such that P(A)=0.3, P(B)=0.4,P(AcupB)=0.6 Find

`P(B | A^c)

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94. If A , B are event such that P(A)=0.6, P(B)=0.4 and P$(A \cap B)$=0.2, then find

P(A | B)

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95. If A , B are event such that P(A)=0.6, P(B)=0.4 and P$(A \cap B)$=0.2, then find

P(B | A)

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96. If A , B are event such that P(A)=0.6, P(B)=0.4 and P$(A \cap B)$=0.2, then find

$P(A \mid B^c)$

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97. If A , B are event such that P(A)=0.6, P(B)=0.4 and P$(A \cap B)$=0.2, then find

$P(B \mid A^c)$

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98. If A and B are independent events,show that

A^c and B^c are independent,

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99. If A and B are independent events,show that

A and B^c are independent

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100. If A and B are independent events,show that

A^c and B are independent.

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101. Two different digits are selected at random from the digits 1 through 9

If the sum is even, what is the probability that 3 is one of the digits selected?

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102. Two different digits are selected at random from the digits 1 through 9

If the sum is odd, what is the probabililty that 3 is one of digits selected?

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103. Two different digits are selected at random from the digits 1 through 9

If 3 is one of the digits selected, what is the probability that the sum is odd?

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104. Two different digits are selected at random from the digits 1 through 9

If 3 is one of the digits selected, what is the probability that the sum is even?

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105. If P (A) = 0.4,P (B | A)= 0.3 and $P(B^c \mid A^c) = 0.2$. find

P (A | B)

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106. If P (A) = 0.4,P (B | A)= 0.3 and $P(B^c \mid A^c) = 0.2$. $f \in d$P (B | A^c)`

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107. If P (A) = 0.4,P (B | A)= 0.3 and `P (B^c | A^c)=0.2. find

P(B)

Watch Video Solution

108. If P (A) = 0.4,P (B | A)= 0.3 and $P(B^c \mid A^c) = 0.2$. $f \in d$P(A^c)`

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109. If P (A) = 0.4,P (B | A)= 0.3 and $P(B^c \mid A^c) = 0.2$. $f \in d$P(A cup B)`

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110. If P(A)=0.6, P(B | A)= 0.5, find P $(A \cup B)$ if A, B are independent.

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111. Two cards are drawn in succession from a deck of 52 cards. What is the probability that

both cards are of denomination greater than 2 and less than 9?

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112. From a bag containing 5 black and 7 white balls, 3 balls are drawn in succession . Find the probability that

all three are of the same colour.

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113. From a bag containing 5 black and 7 white balls, 3 balls are drawn in succession . Find the probability that

each colour is represented.

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114. A die is rolled until a 6 is obtained. What is the probability that

you end up in the second roll

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115. A die is rolled until a 6 is obtained. What is the probability that

you end up in the third roll.

116. A person takes 3 tests in succession. The probability of his (her) passing the first test is 0.8. The probability of passing each successive test is 0.8 or 0.5 according as he passes or fails

the preceding test. Find the probability of his (her) passing at least 2 tests.

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117. A person takes 4 tests in succession. The probability of his passing the first test is p, that of his passing each succeeding test is p or $\frac{p}{2}$ depending on his passing or failing the preceding test, Find the probabilty of his passing

at least three test

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118. A person takes 4 tests in succession. The probability of his passing the first test is p, that of his passing each succeeding test is p or $\frac{p}{2}$ depending on his passing or failing the preceding test, Find the probabilty of his passing

just three tests.

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119. Given that all three faces are different in a throw of three dice, find the probability that at least one is a six

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120. Given that all three faces are different in a throw of three dice, find the probability that the sum is 9.

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121. From the set of all families having three children, a family is picked at random

If the eldest child happens to be a girl, find the probability that she has two brothers.

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122. From the set of all families having three children, a family is picked at random

If one child of the family is a son. find the probablilty that he has two sisters.

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123. Three persons hit a target with probability $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. If each one shoot at the target once,

find the probability that exactly one of them hits the target

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124. Three persons hit a target with probability $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. If each one shoot at

the target once,

if only one of them hits the target what is the probability that it was the first person ?

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125. A bag contains 5 white and 3 black marbles and a second bag contains 3 white and 4 black marbles. A bag is selected at random and a marble is drawn from it. Find the probability that it is white. Assume that

either bag can be chosen with the same probability.

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126. A bag contains 5 white and 3 black balls, a second bag contains 4 white and 5 black balls, a third bag contains 3 white and 6 black balls. A bag is selected at rendom and a ball is drawn. Find the probability that the ball is black.

Do the problem assuming that the probability of choosing each bag is same.

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127. A bag contains 5 white and 3 black balls, a second bag contains 4 white and 5 black balls, a third bag contains 3 white and 6 black balls. A bag is selected at rendom and a ball is drawn. Find the probability that the ball is black.

Do the problem assuming that the probability

of choosing the first bag is twice as much as choosing the second bag, which is twice as much as choosing the third bag.

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128. A and B play a game by alternately throwing a pair of dice. One who throws 8 wins the game. If A starts the game, find their chances of winning.

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129. A and B play a game by alternately throwing a pair of dice. One who throws 8 wins the game. If A starts the game, find their chances of winning.

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130. There are 6 white and 4 black balls in a bag. If four are drawn successively (and not replaced),find the probability that they are alternately of different colour.

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131. Five boys and four girls randomly stand in a line. Find the probability that no two girls come together.

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132. If you throw a pair of dice n times, find the probability of getting at least one doublet. [When you get identical members you call it a doublet. You can get a double in six ways: (1,1),

(2,2),(3,3),(4,4),(5,5) and (6,6) , thus the probability of getting a doublet is $\frac{6}{36}=\frac{1}{6}$, so that the probability of not getting a doublet in one throw is $\frac{5}{6}$].

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133. Suppose that the probability that your alarm goes off in the morning is 0.9. If the alarm goes off, the probability is 0.8 that you attend your 8 a.m. class. If the alarm does not go to off, the probability that you make your 8

a.m.class is 0.5. Find the probability that you make your 8 a.m. class.

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134. If a fair coin is tossed 6 times, find the probability that you get just one head.

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135. Can you generalize this situation? If a fair coin is tossed six times, find the probability of

getting exactly 2 heads.

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136. There are 3 bags B_1, B_2 and B_3 having respectively 4 white, 5 black, 3 white, 5 black and 5 white, 2 black balls. A bag is chose at random and a ball is drawn from it. Find the probability that the ball is white.

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137. There are 25 girls and 15 boys in class XI and 30 boys and 20 girls in class XII. If a student chosen from a class, selected at random, happens to be a boy, find the probability that he has been chosen from class XII.

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138. Out of the adult population in a village 50% are farmers, 30% do business and

20% are service holders. It is known that 10% of the farmers, 20% of the business holders and 50% of service holders are above poverty line. What is the probability that a member chosen from any one of the adult population, selected at random, is above poverty line?

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139. Out of the adult population in a village 50% are farmers, 30% do business and

20% are service holders. It is known that 10% of the farmers, 20% of the business holders and 50% of service holders are above poverty line. If a member from any one of the adult population of the village, chosen at random, happens to be above poverty line, then estimate the probability that he is a farmer.

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140. From a survey conducted in a cancer hospital it is found that 10% of the patients were alcoholics, 30% chew gutka and 40% have no specific carcinogenic habits. If cancer strikes 80% of the smokers, 70% of alcoholics, 50% of the non specific, then estimateic the probability that a cancer patient chosen from any one of the above types, selected at random,

is a smoker

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141. From a survey conducted in a cancer hospital it is found that 10% of the patients were alcoholics, 30% chew gutka and 40% have no specific carcinogenic habits. If cancer strikes 80% of the smokers, 70% of alcoholics, 50% of the non specific, then estimateic the probability that a cancer patient chosen from any one of the above types, selected at random,

is alcoholic

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142. From a survey conducted in a cancer hospital it is found that 10% of the patients were alcoholics, 30% chew gutka and 40% have no specific carcinogenic habits. If cancer strikes 80% of the smokers, 70% of alcoholics, 50% of the non specific, then estimateic the probability that a cancer patient chosen from any one of the above types, selected at random,

chews gutka

Watch Video Solution

143. From a survey conducted in a cancer hospital it is found that 10% of the patients were alcoholics, 30% chew gutka and 40% have no specific carcinogenic habits. If cancer strikes 80% of the smokers, 70% of alcoholics, 50% of the non specific, then estimateic the probability that a cancer patient chosen from any one of the above types, selected at random,

has no specific carcinogenic habits.

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144. State which of the following is the probability distribution of a random variable X with reasons to your answer :

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145. State which of the following is the probability distribution of a random variable X with reasons to your answer :

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146. State which of the following is the probability distribution of a random variable X with reasons to your answer :

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147. Find the probability distribution of number of doublets in four throws of a pair of

dice. Find also the mean and the variance of the number of doublets.

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148. Four cards are drawn successively with replacement from a well shuffled pack of 52 cards. Find the probability distribution of the number of aces. Calculate the mean and variance of the number of aces.

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149. Find the probability distribution of number of heads in three tosses of a coin.

150. Find the probability distribution of number of heads in simultaneous tosses of four coins.

151. A biased coin where the head is twice as likely to occur as the tail is, tossed thrice. Find the probability distribution of number of heads.

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152. Two cards are drawn successively with replacement from a well-shuffled deck of 52 cards. Find the probability distribution of the number of aces.

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153. From a box containing 32 bulbs out of which 8 are defective 4 bulbs are drawn at random successively one after anoter with replacement. Find the probability distribution of the number of defective bulds.

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154. A random variable X has the following probability distribution

 Determine R

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155. A random variable X has the following probability distribution

 Determine $P(X < 4)$

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156. A random variable X has the following probability distribution

Determine $P(X \geq 2)$

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157. A random variable X has the following probability distribution

Determine $P(2 \leq X \leq 5)$

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158. Find the mean and the variance of the number obtained on a throw of an unbiased

coin.

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159. A pair of coins is tossed 7 times. Find the probability of getting

exactly five tails

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160. A pair of coins is tossed 7 times. Find the probability of getting

at least five tails

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161. A pair of coins is tossed 7 times. Find the probability of getting

at most five tails

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162. If a pair of dice is thrown 5 times then find the probability of getting three doublets.

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163. Four cards are drawn successively with replacement from a well-shuffled pack of 52 cards. What is the probability that :

all the four cards are diamonds

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164. Four cards are drawn successively with replacement from a well-shuffled pack of 52

cards. What is the probability that :

only two cards are diamonds

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165. Four cards are drawn successively with replacement from a well-shuffled pack of 52 cards. What is the probability that :

none of the cards is a diamond.

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166. In an examination there are twenty multiple choice question each of which is supplied with four possible answers. What is the probability that a candidate would score 80% or more in the answer to these questions ?

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167. A bag contains 7 balls of different colours. If five balls are drawn successively with

replacement then what is the probability that none of the balls drawn is white ?

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168. Find the probability of throwing at teast 3 sixes in 5 throws of a dia.

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169. The probability that a student securing first division ia an examination is $\frac{1}{10}$. What is

the probability that out of 100 students twenty pass in first division ?

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170. Sita and Gita throw a dia alternatively till one of them gets a 6 to win the game. Find their respective probability of winning if Sita starts first.

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171. If a random variable X has a binomial distribution B $\left(8, \frac{1}{2}\right)$ then find X for which the outcome is the most likely.

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