



MATHS

BOOKS - PRADEEP PUBLICATION

PROBABILITY

Example

1. If E_1 and E_2 are two independent events associated with an

experiment, then show that

 E_1^c and E_2^c are alos independent.

Watch Video Solution

2. If E_1 and E_2 are two independent events associated with an

experiment, then show that

 $P(E_1\cup E_2)=1-Pig(E_1^cig)Pig(E_2^cig)$



3. Given
$$P(A+B)=rac{5}{6},\ P(AB)=rac{1}{3}$$
 and $P(B^c)=rac{1}{2}$.

Determine P(A) and P(B) and show that A and B are independents events.

Watch Video Solution

4. If P(A)=0.8, P(B)=0.5 and P(B/A)=0.4 find P(A/B)



5. If A and B are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$, then find P(B/A)

Watch Video Solution

6. If A and B are two events such that $P(A)=rac{1}{2},$ $P(B)=rac{1}{3}$ and $P(A\cap B)=rac{1}{4},$ then find P(A/B)

Watch Video Solution

7. If A and B are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$, then find P(A' / B')



8. If A and B are events such that
$$P\left(\frac{A}{B}\right) = P\left(\frac{B}{A}\right)$$
, then

Watch Video Solution

9. Events A and B are such that
$$P(A) = \frac{1}{2}$$
, $P(B) = \frac{7}{12}$ and P(not A or not B) $= \frac{1}{4}$. State whether A and B are independent.

Watch Video Solution

10. If
$$P(A) = \frac{7}{13}$$
, $P(B) = \frac{9}{13}$ and $P(A \cap B) = \frac{4}{13}$ evaluate $P(A \mid B)$

Watch Video Solution

11. If E_1 and E_2 are independent events associated with an experiment such that $P(E_1) = P_1$ and $P(E_2) = P_2$. Find $P(E_1 \text{ and } E_2)$.



12. If E_1 and E_2 are independent events associated with an experiment such that $P(E_1) = P_1$ and $P(E_2) = P_2$. Find $P(E_1$ but not E_2).

Watch Video Solution

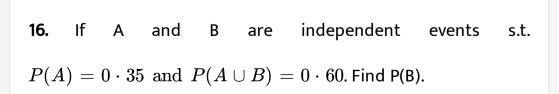
13. If E_1 and E_2 are independent events associated with an experiment such that $P(E_1) = P_1$ and $P(E_2) = P_2$. Find $P(E_1 \text{ and } E_2)$.

14. If E_1 and E_2 are independent events associated with an experiment such that $P(E_1) = P_1$ and $P(E_2) = P_2$. Find $P(E_1 \text{ and } E_2)$.

Watch Video Solution

15. If E_1 and E_2 are independent events associated with an experiment such that $P(E_1) = P_1$ and $P(E_2) = P_2$. Find $P(E_1 \text{ or } E_2)$.

Watch Video Solution





17. 10% of the bulbs produced in a factory are red colour and 2% are red and defective. If one bulb is picked up at random, determine the probability of its being defective if it is red.



18. A card is drawn from a well shuffled pack of 52 cards. The outcome is noted and the pack is again reshuffled without replacing the card. Another card is then drawn. What is the probability that the first card is a spade and the second is a black king?



19. The odds against a certain event are 5 to 2, the odds in favour of another event independent of the former are 6 to 5. find the probability that at least one of the events happens.

Watch Video Solution

20. A coin is tossed thrice and all eight outcomes are assumed equally likely. In which of the following cases are the events A and B independent? A: "the first throw results in head" B:"the last throw results in tail"

Watch Video Solution

21. A coin is tossed thrice and all eight outcomes are assumed equally likely. In which of the following cases are the events A

and B independent? A: " the number of heads is two" B:"the last

throw results in head"



22. A coin is tossed thrice and all the eight outcomes are assumed to be equally likely. In which of the following cases are the events E_1 and E_2 independent?

 E_1 : 'the number of heads is odd E_2 : 'the number of tail is odd'.



23. For a biased dice, the probabilities of outcomes are given as

under

$$P(1) = P(2) = 0.2, P(3) = P(5) = P(6) = 0.1$$
 and $P(4) = 0.3$

The die is tossed two times. Let A and B the events, same number each time and a total score is 10 or more respectively. Determine whether or not A and B are independent.

Watch Video Solution

24. In part (ii), For a loaded die,the probabilities of outcomes are given as under :P(1)=P(2)=P(3)=P(4)=P(5)=P(6)=1/6.the die is thrown two times.Let A and B be the events, same number each times, and a total score is 10 or more, respectively.Determine if the dice were fair, whether or not the events A and B would be independent.



25. A die is thrown. If E is the event 'the number appearing is a multiple of 3' and F be the event 'the number appearing is even' then find whether E and F are independent ?

Watch Video Solution

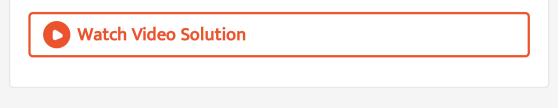
26. An unbiased die is thrown twice. Let the event A be 'odd number on the first throw' and B the event 'odd number on the second throw'. Check the independence of the events A and B.

Watch Video Solution

27. The probability of student A passing an examination is $\frac{3}{5}$ and of student B pasing is $\frac{4}{5}$. Assuming the two events: 'A

passes', 'B passes', as independent find the probability of:

both students passing the examination.



28. The probability of student A passing an examination is $\frac{3}{5}$ and of student B pasing is $\frac{4}{5}$. Assuming the two events: 'A passes', 'B passes', as independent find the probability of: both students passing the examination.

Watch Video Solution

29. The probability of student A passing an examination is $\frac{3}{5}$ and of student B pasing is $\frac{4}{5}$. Assuming the two events: 'A passes', 'B passes', as independent find the probability of: neither of the two passing the examination.

30. The probability of student A passing an examination is $\frac{3}{5}$ and of student B pasing is $\frac{4}{5}$. Assuming the two events: 'A passes', 'B passes', as independent find the probability of: neither of the two passing the examination.

Watch Video Solution

31. A university has to select an examiner from a list of 50 persons, 20 of them are women and 30 men, 10 of them knowing Hindi and 40 not, 15 of them being teacher and the remaining 35 not. What is the probability of the two university selecting a Hindi knowing women teacher?



32. A committee of 4 students is selected at random from a group consisting 8 boys and 4 girls. Given that there is at least one girl in the committee, calculate the probability that there are exactly 2 girls in the committee.

> Watch Video Solution

33. In a school, there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a student chosen randomly studies in Class XII given that the chosen student is a girl?



34. Find the probability of drawing a diamond card in each of two consecutive draws of a single card from a well shuffled pack of cards if

the first card is replaced before the second one is taken out.

Watch Video Solution

35. Find the probability of drawing a diamond card in each of two consecutive draws of a single card from a well shuffled pack of cards if

the first one is not replaced.



36. Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. What is the probability that first two cards are kings and the third card drawn is an ace?

Watch Video Solution

37. Find the chance of drawing 2 white balls in succession from a bag containing 3 red and 5 white balls, the balls drawn first not being replaced.



38. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement.

What is the probability that both drawn balls are black?



39. A bag contains 5 red marbles and 3 black marbles. Three marbles are drawn one by one without replacement. What is the probability that at least one of three marbles drawn be black if the first marble is red?



40. A bag contains 4 white and 6 black balls. One ball is drawn and laid aside without noticing it colour. Another ball is then drawn. What is the probability that the second balls is black?



41. A bag contians 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, find the probability that

one is white and one is black.

Watch Video Solution

42. A bag contains 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, find the probability that

both are white.



43. Two balls are drawn from an urn containing 2 white, 3 red and 4 black balls one by one without replacement. What is the probability that

both the balls are of same colour?

Watch Video Solution

44. Two balls are drawn from an urn containing 2 white, 3 red and 4 black balls one by one without replacement. What is the probability that

atleast one ball is red?



45. A bag contains 4 yellow and 5 red balls and another bag contains 6 yellow and 3 red balls . A ball is drawn from the first bag and without seeing its colour, it is put into the second bag . Find the probability that if now a ball is drawn from the second bag, it is yellow in colour .



46. A problem is given to three children, whose chances of solving it are $\frac{1}{3}$, 1/5 and 1/6[°], what is the probability that : At least one of them may solve. it.



47. An urn contains 25 balls numbered 1 to 25. suppose an odd number if considered a success. Two balls drawn from the urn with replacement. Find the probability of getting two success.

Watch Video Solution

48. An urn contains 25 balls numbered 1 to 25. suppose an odd number if considered a success. Two balls drawn from the urn with replacement. Find the probability of getting exactly one success.



49. An urn contains 25 balls numbered 1 to 25. suppose an odd number if considered a success. Two balls drawn from the urn with replacement. Find the probability of getting

atleast one success.

Watch Video Solution

50. An urn contains 25 balls numbered 1 to 25. suppose an odd number if considered a success. Two balls drawn from the urn with replacement. Find the probability of getting two success.

two success.



51. Ten cards numbered 1 to 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 3, what is the probability that it is an even number?

Watch Video Solution

52. A speaks truth in 60% of the cases, while B in 90% of the cases. In what percentage are they likely to contradict each other in stating the same fact? In the case of contradiction do you think , the statement of B will carry more weight as he speaks truth in more number of case than A?

Watch Video Solution

53. A speaks truth in 70% of the cases and B in 80% of the cases. In what percent of cases are they likely to agree in stating the fact ? Do you think, when they agree mean both are speaking truth ?

Watch Video Solution

54. Let $E_1, E_2, E_3, \ldots, E_n$ be independent events with respective probability $P_1, P_2, P_3, \ldots, P_n$ find the probability that

none of them occurs.



55. Let $E_1, E_2, E_3, \ldots, E_n$ be independent events with respective probability $P_1, P_2, P_3, \ldots, P_n$ find the probability that

none of them occurs.

Watch Video Solution

56. Two persons throw a dice alternately till one of them gets a 'six' and wins the game. Find their respective probabilities of winning.



57. A coin is tossed once. If the shows head, it is tossed again and if it shows tail, then a dice is tossed. Let E_1 be the event with first toss results into a tail and E_2 , the event: the dice shows a number greater than 4. find $P(E_2/E_1)$.

Watch Video Solution

58. A die is thrown three times. Events A and B are defined as below: A : 4 on the third throw B : 6 on the first and 5 on the second throw Find the probability of A given that B has already occurred.



59. A bag contains 3 red and 4 black balls and another bag has 4 red and 2 black balls. One bag is selected, each of the two bags being equally likely to be selected. From the selected bag, a ball is drawn, each ball is the bag being equally likely to be drawn.

Let E_1 be the event: 'the first bag is selected , E_2 , the event the second bag is selected and E_3 , the event: 'a red balls is drawn. find $P(E_1)$, $P(E_2)$, $P(E_3/E_1)$ and (E_3/E_2) .

Watch Video Solution

60. A and B are two independent events. The probability that both A and B occur is $\frac{1}{6}$ and is probability that neither of them occurs is $\frac{1}{3}$. Find the probability of the occurrence of A.

Watch Video Solution

61. If A and B are two independent events such that : $P(\overline{A} \cap B) = \frac{2}{15}$ and $P(A \cap \overline{B}) = \frac{1}{6}$, then find P(A) and P(B).

Watch Video Solution

62. A box containing 2 Black, 4 White and 3 Red balls. One ball is drawn at random from the box and kept aside. From the remaining balls in the another ball is drawn and kept besite the first. Thr process is repeated till all the balls are drawn from the box The probability that the balls drawn from the box are in the sequence 2 Black, 4 White and 3 Red, is

Watch Video Solution

63. Urn A contains 6 red and 4 white balls and urn B contains 4 red and 6 white balls. One ball is drawn at random from urn A and placed in urn B. Then a ball is drawn from urn B and placed in urn A. Now, if one ball is drawn from urn A, the probability that it is red, is

64. A bag contains 3 white and 5 black balls. A ball is drawn at random. Find the chance that it is a black ball.

Watch Video Solution

65. In a multiple choice questions there are four alternative answers, of which one or more correct. A candidate will get marks in the question only if the ticks all the correct answers. The candidate decides to tick answers at random. If the is allowed upto three chances to answer the question, find the probability that he will get marks in the questions.

Watch Video Solution

66. Two persons throw a dice alternately till one of them gets a 'six' and wins the game. Find their respective probabilities of winning.

Watch Video Solution

67. A and B throw a pair of dice alternately. A wins the game if he gets a total of 6 and B wins if he gets a total of 7. If A starts the game, find the probability of winning the game by A in third row of pair of dice.



68. An anti-air craft gun can take maximum four at an enemy plane, moving away from it. The probabilities oh hitting the

plane at first, second, third and fourth shot are 0.4, 0.3, 0.2 and 0.1 respectively. What is the probability that the gun hits the plane? Do you agree with us that the success will raise the morale of Indian Army?

Watch Video Solution

69. A coin is tossed twice, what is the probability that:

one head and one tail occurs?



70. In a purse there are 10 coins, all shillings except one, which is a sovereign in another purse, there are 10 coins, all shilings. Nine coins are taken from the former purse and put into the latter, and then nine coins are taken from the latter and put into the former. find the chance that the sovereign is still in the

first purse.



71. A bag contains 4 red and 3 black balls. A second bag contains 2 red and 4 black balls. One bag is selected at random. From the selected bag, one ball is drawn. Find the probability that the ball drawn is red.



72. Bag I contains 4 black and 6 red balls, bag II contains 7 black and 3 red balls and bag III contains 5 black and 5 red balls. One bag is chosen at random and a ball is drawn from it which is found to, be red. Find the probability that the ball is drawn from

bag II.



73. A person has undertaken a construction job. The probabilities are 0.65 that there will be strikes 0.80, that the construction job will be completed on time if there is no strike, and 0.32 that the construction job will be completed on time if there is a strike. Determine the probability that the construction job will be completed on time.



74. A company has two plants to manufacture scooters. Plant-1 manufactures 70% of the scooters and Plant-2 manufactures

30%. At plant-1, 80% of the scooters are rated of standard quantity and at plant-2, 90% of the scooters are rated of standard quality. A scooter is choosen at random and is found to be of standard quality. find the probability that it has come from plant-2.

Watch Video Solution

75. Suppose that the reliability of a HIV test is specified as follows: Of people having HIV, 90% of the test detect the disease but 10% go undetected. Of people free of HIV, 99% of the test are judged HIV–ive but 1% are diagnosed as showing HIV+ive. From a large population of which only 0.1% have HIV, one person is selected at random, given the HIV test, and the pathologist reports him/her as HIV+ive. What is the probability that the person actually has HIV?



76. Bag I contains 3 red and 4 black balls while another Bag II contains 5 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it was drawn from Bag II.



77. Coloured balls are distributed in four boxes as shown in the

following table:

Box	Colour			
	Black	White	Red	Blue
Lori	3	4	5	6
п	2	2	2	2
ш	1	2	3	1
IV	4	3	1	5

A box is selected at random and then a ball is randomly drawn

from the selected box. The colour of the ball is black. What is

the probability that ball drawn is from box III?



78. A pack of playing cards was found to contain only 51 cards. If the first 13 cards which are examined are all red, what is the probability that the missing card is black.



79. A card from a pack of 52 playing cards is lost. From the remaining cards of the pack, three cards are drawn at random(without replacement) and re found to be all spades. Find the probability that the lost card being a spade.

80. A man is known to speak the truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six.

Watch Video Solution

81. A factory has three machines X,Y and Z producing 1000, 2000 and 3000 bolts per day respectively. The machine X produces 1% defective bolts, Y produces 1.5% and Z produces 2% defective bolts. At the end of a day, a bolt is drawn at random and is found defective. what is the probability that the defective bolt is produced by the machine X?



82. In a factory which manufactures bolts, machines A, B and C manufacture respectively 30%, 50% and 20% of the bolts. Of there outputs 3, 4, 1 percent respectively are defective bolts. A bolt is drawn at random from the product and is found to be defective. Find the probability that this is not manufactured by machine B.



83. Give three identical boxes I , II and III, each containing two coins. In box I both coins are gold coins, in box II both are silver coins and in box III there is one gold and one silver coin. A person chooses a box at random and takes out a coin. If the coin is of gold, what is the probability that the other coin in the box is also of gold ?



84. There are three coins. One of the two headed coin another is a biased coin that comes up heads 75% of the times and the third is also a biased coin tht comes up tails 40% of the times. One of the three coins is chosen at random and tossed, and it shows head. what is the probability that it is a two headed coin?



85. In a set of 10 coins, 2 coins with heads on both sides. A coin is selected at random from this set and tossed five times. Of all the five times, the result was head, find the probability that the selected coin had heads on both sides.

86. A bag contains 2 red and 3 black balls. One ball is drawn and then put back in the bag. The process is repeated three times. Every time the ball drawn happens to be red we say that the saw has resulted in a success. Let X denote the number of success recorded in 3 draws. show that X can be considered as random variable and exhibit it as a function one the sample space of the experiment.

Watch Video Solution

87. A person plays a game of tossing a coin thrice. For each head he is given Rs 2 by the organiser of the game and for each tail he has to give Rs 1.50 to the organiser. Let X denote the amount gained or lost by the person. Show that 'X' is a random variable and exhibit it as a function on the sample space of the experiment.



88. A dice is tossed twice. A success is getting an even number on a toss. Find the probability distribution of the number of success. Also draw the table of this probability distribution.



89. Three cards are drawn successively with replacement from well-shuffled deck of 52 cards. A random variable X denotes the number of spades in three cards. Determine the probability distribution of X.



90. Find the probability distribution of the random variable X which denotes the number of ites 'a total of 9' appears in two thros of a pair of dice. Sketch its graph.



91. Find the probability distribution of number of doublets in 2

throws a pair of dice.



92. A box contains 12 bulbs of which 3 are defective. A sample of 3 bulbs is selected from the box. Let X denotes the number of defective bulbs in the sample, find the probability distribution of X.



93. Let X denotes the number of hours you study during a randomly selected schoold day. The probabildity X can take the value of x is given by

$$P(X=x) = egin{cases} 0.1 & ext{if} \;\; x=0 \ kx & ext{if} \;\; x=1 \; ext{or} \;\; 2 \ k(5-x) & ext{if} \;\; x=3 \; ext{or} \;\; 4' \ 0 & ext{otherwise} \end{cases}$$

where k is some unknown constant

Find the value of k.



94. Let X denotes the number of hours you study during a randomly selected schoold day. The probabildity X can take the value of x is given by

$$P(X=x) = egin{cases} 0.1 & ext{if} \;\; x=0 \ kx & ext{if} \;\; x=1 \; ext{or} \;\; 2 \ k(5-x) & ext{if} \;\; x=3 \; ext{or} \;\; 4' \ 0 & ext{otherwise} \end{cases}$$

where k is some unknown constant

What is the probability that you study for

atleast two hours?

Watch Video Solution

95. Let X denotes the number of hours you study during a randomly selected schoold day. The probabildity X can take the value of x is given by

$$P(X=x) = egin{cases} 0.1 & ext{if} \;\; x=0 \ kx & ext{if} \;\; x=1 \; ext{or} \;\; 2 \ k(5-x) & ext{if} \;\; x=3 \; ext{or} \;\; 4' \ 0 & ext{otherwise} \end{cases}$$

where k is some unknown constant

What is the probability that you study for

exactly two hours?

96. Let X denotes the number of hours you study during a randomly selected schoold day. The probabildity X can take the value of x is given by

$$P(X=x) = egin{cases} 0.1 & ext{if} \;\; x=0 \ kx & ext{if} \;\; x=1 \; ext{or} \;\; 2 \ k(5-x) & ext{if} \;\; x=3 \; ext{or} \;\; 4' \ 0 & ext{otherwise} \end{cases}$$

where k is some unknown constant

What is the probability that you study for

atmost two hours?



97. Find the mean and variance of the random variable X, whose probability distribution is given by the following table:

x	-2	-1	0	1	2	3
P (X)	0.10	0.20	0.30	0.20	0.15	0.05

Watch Video Solution

98. A discrete random variable X has the following the probability distribution:

X	0.5	1	1.5	2
P(X)	k	k ²	2k ²	k

Determine the value of k.



99. A discrete random variable X has the following the probability distribution:

X	0.5	1	1.5	2
P(X)	k	k ²	2k ²	k

Determine the mean of the distribution.

Watch Video Solution	
----------------------	--

100. The probability distribution of a random variable X is given

as under:

X	1	2	4	2 <i>k</i>	3 <i>k</i>	5k
P(X)	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{3}{25}$	$\frac{1}{10}$	$\frac{1}{25}$	$\frac{1}{25}$

Calculate the value of k if E(X)=2.94.



101. The probability distribution of a random variable X is given

as under:

X	1	2	4	2 <i>k</i>	3k	5k
P (X)	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{3}{25}$	$\frac{1}{10}$	$\frac{1}{25}$	$\frac{1}{25}$

given E(x)=2.94 Calculate variance of X.

Watch Video Solution

102. Two cards are drawn with replacement from a well shuffled

deck of 52 cards. Find μ and σ for the numebr of aces.



103. Two cards are drawn simultaneously (or successively without replacement) from a well shuffled pack of 52 cards. Find the mean, variance and standard deviation of the number of kings.

Watch Video Solution

104. Find the mean and standard deviation of the probability distribution of the number obtained when a card is drawn at random from a set of 7 cards numbered 1 to 7.



105. There are 5 cards numbered 1 to 5, one number on one card. Two cards are drawn at random without replacement. Let

X denote the sum of the numbers on the two cards drawn. Find

the mean and variance of X.

Watch Video Solution

106. A dice is thrown thrice. Find the mean and variance of the number of times a 'six' is obtained.

> Watch Video Solution

107. Find the probability distribution of the number of heads

when three coins are tossed.

Also find the mean number of heads in the above case.

108. A pair of dice is rolled twice. Let X denote the number of times, 'a total of 9 is obtained'. Find the mean and variance of the random variable X.

Watch Video Solution

109. Find the probability distribution of the maximum of the two scores obtained when a dice is thrown twice. Determine also the mean of the distribution.

Watch Video Solution

110. Two numbers are selected at random from first six positive integers. Let X denote the larger of the two numbers obtained.

Find the probability distribution of X. find the mean and variance of this distribution.

Watch Video Solution

111. On one of 8 identical slips of paper, it is written 0, on the other it is written 3, on three of them it is written 1 on the top of the remaining three it is written 2. slips are folded and mixed throughly. One slip is drawn at random. If X is the number on the slip, find the probability distributoin of X. also find the mean and variance.



112. Suppose 10000 tickets are sold in a lottery each for Rs.1. first prize is of Rs. 3000 and the second prize is of Rs. 2000. There

are three 3rd prizes of Rs.500 each. If you buy one ticket, what is

your exception?

Watch Video Solution
113. Determine the binomial distribution whose mean is 10 and
whose standard deviation is $2\sqrt{2}$.

Watch Video Solution

114. A pair of dice is thrown 200 times. If getting a sum of 9 is considered a success, find the mean and the variance of the number of success.

115. A dice is thrown 3 times. If getting 'six' is considered a success, find the probability of

3 successes.

Watch Video Solution

116. A die is thrown 3 times. If getting an multiple of 3 is

considered a success, find the probability of at least 2 successes.



117. Two dice are thrown 6 times. 'A total of 7' is considered as success. Find the probability of atleast 4 successes.



118. If eight fair coins are tossed, what is the probability that

there are

exactly 3 heads.

D Watch Video Solution

119. If eight fair coins are tossed, what is the probability that

there are

not more than 3 heads?

Watch Video Solution

120. If a fair coin is tossed 10 times, find the probability of: exactly six heads

121. An unbiased coin is tossed 10 times. Find by using binomial

distribution, the probability of getting

atleast six heads.



122. An unbiased coin is tossed 10 times. Find by using binomial

distribution, the probability of getting

atmost six heads.

Watch Video Solution

123. A pair of dice is thrown 5 times. If getting a doublet is considered a success, find the probability of 2 successes.

124. There are 6% defective items in a large bulk of items. Find the probability that a sample of 8 items will include not more than one (or less than two) defective item.

Watch Video Solution

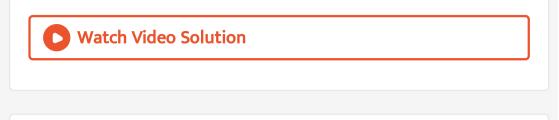
125. Ten eggs are drawn successively with replacement from a lot containing 10% defective eggs. Find the probability that there is at least one defective egg.

Watch Video Solution

126. From a lot of 15 bulbs which include 5 defectives, a sample of 4 bulbs is drawn one by one with replacement. Find the

probability distribution of the number of defective bulbs. Hence,

find the mean of the distribution.



127. A die is thrown again and again until three sixes are obtained. Find the probability of obtaining the third six in the sixth throw of the die.



128. Four cards are drawn successively with replacement from a

well shuffled deck of 52 cards. What is the probability that

all the four cards are spades?

129. Four cards are drawn successively with replacement from a well shuffled deck of 52 cards. What is the probability that

only 3 cards are spades?

Watch Video Solution

130. Five cards are drawn successively with replacemnet form a

well shuffled deck of 52 cards. What is the probability that

none is a spade?

Watch Video Solution

131. A coin is tossed 5 times. What is the probability that head

appears on odd number of times?

132. A bag contains 7 red, 4 white and 5 black balls. If four balls are drawn one by one the replacement, what is the probability that

atleast one is white?



133. A bag contains 7 red, 4 white and 5 black balls. If four balls are drawn one by one the replacement, what is the probability that

only two are white?



134. A bag contains 7 red, 4 white and 5 black balls. If four balls are drawn one by one the replacement, what is the probability that

only two are white?

Watch Video Solution

135. A bag contains 7 red, 4 white and 5 black balls. If four balls are drawn one by one the replacement, what is the probability that

atleast one is white?

136. Five dice are thrown 729 times. How many times do you except that atleast four dice to show five or six?



137. An experiment succeeds thrice as often as it fails. Find the probability that in the next five trials, there will be at least 3 successes.



138. A coin is thrown 10 times and getting a head is considered a success. Find the mean and the standard deviation of the number of success.



139. If the sum of the mean and variance of a binomial distribution of 5 trials is $\frac{35}{16}$, find the distribution.

Watch Video Solution

140. The sum of mean and variance of a binomial distribution is

15 and their product is 54. find the distribution.



141. For 6 trials of an experiment. Let X be a binomial variate

which satisfies the relation 9P(X=4)=P(X=2)

Find the probability of success.



142. True/False:

The probability of losing a game is 0.7. The probability of winning the game is 0.3.

Watch Video Solution

143. One hundred identical coins, each with probability p of showing up a head are tossed once. if 0 and the probability of heads showing on 50 coins is equal to that of showing on 51 coins, then find the value of p.



144. How many times must a fair coin be tossed so that the probability of getting at least one head is more than 80%?



145. Find the minimum number of tosses of a pair of a dice, so that the probability of getting the sum of the digits on the dice equal to 7 on atleast one toss, is greater than 0.95. (Given $(\log_{10})2 = 0.3010, (\log_3)3 = 0.4771)$

Watch Video Solution

146. The probability of a shooter hitting a target is $\frac{3}{4}$. How many minimum number of times must he/she fire so that the probability of hitting the target at least once is more than 0.99?



147. A man takes a step forward with probability 0.4 and backwards with probability 0.6 find the probability that at the end of eleven steps he is one step away from the starting point.

148. Describe the distribution $B\left(4, \frac{1}{3}\right)$. Also find the mean and

variance.

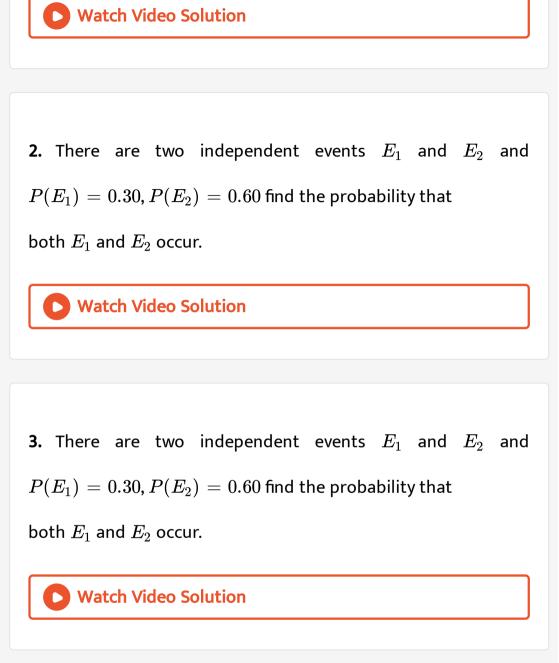
Watch Video Solution

Watch Video Solution

Exercise

1. A dice is rolled twice in succession. Find the probability of a

number greater than 4 on each throw.



4. There are two independent events E_1 and E_2 and $P(E_1)=0.30, P(E_2)=0.60$ find the probability that

one and only one event happens.



5. There are two independent events E_1 and E_2 and $P(E_1)=0.30, P(E_2)=0.60$ find the probability that at least one of E_1 and E_2 happens.

Watch Video Solution

6. Let E_1 and E_2 be two independent events such that $P(E_1)=
ho_1$ and $P(E_2)=
ho_2$. Describe in words, the events

 $\rho_1 \rho_2$.



7. Let E_1 and E_2 be two independent events such that $P(E_1)=
ho_1$ and $P(E_2)=
ho_2$. Describe in words, the events probabilities are

 $\rho_1 \rho_2$.

Watch Video Solution

8. Let E_1 and E_2 be two independent events such that $P(E_1)=
ho_1$ and $P(E_2)=
ho_2$. Describe in words, the events probabilities are

$$1-(1-
ho_1)(1-
ho_2)$$

9. Let E_1 and E_2 be two independent events such that $P(E_1)=
ho_1$ and $P(E_2)=
ho_2$. Describe in words, the events probabilities are

 $\rho_1+\rho_2-2\rho_1\rho_2.$

Watch Video Solution

10. A bag contains 5 red, 7 green and 4 white balls. Three balls are drawn one after another without replacement. Find the probability that the balls drawn are white, red and green in this very order.



11. A bag contains 5 red, 7 green and 4 white balls. Three balls are drawn one after another without replacement. Find the probability that the balls drawn are white, red and green in this order.

Watch Video Solution

12. A bag contains 5 white, 7 red and 8 black balls. If four balls are drawn one by one without replacement, what is the probability that all are white?

> Watch Video Solution

13. If A and B are two independent events such that $P(A\cup B)=0.6$ and P(A)=0.2 find P(B).

14. If A and B are two independent events such that $P(A\cup B)=0.5, P(B)=0.2$ find P(A).

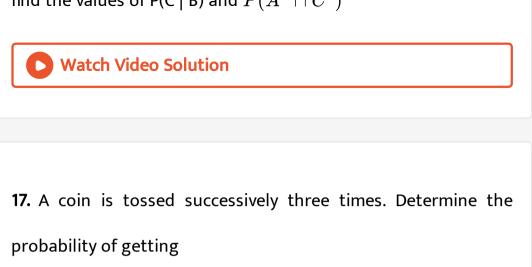
Watch Video Solution

15. Two dice are thrown together and the total score is noted. The events E, F and G are respectively, a total of 4, a total of 9 or more, and 'a total divisible by 5' calculate P(E), P(F) and P(G) and decide which pair of events, if any, are indepenent.

Watch Video Solution

16. Three events A, B and C have probabilities $\frac{2}{5}$, $\frac{1}{3}$ and $\frac{1}{2}$, respectively. Given that $P(A \cap C) = \frac{1}{5}$ and $P(B \cap C) = \frac{1}{4}$,

find the values of P(C | B) and $P(A^{\,\prime} \cap C^{\,\prime})$



exactly two heads.

Watch Video Solution

18. Three coins are tossed once. Find the probability of getting

at least two heads.



19. Three coins are tossed. Find the probability of : atmost two

heads

Watch Video Solution

21. Two dice are tossed. Find whether the following two events A and B are independent:

A=
$$\{(x,y)\!:\!x+y=11\}$$
, B= $\{(x,y)\!:\!x
eq 5\}$, where (x,y) denotes

a typical sample point.

22. Two dice are thrown together. Let A be the event 'getting 6 on the first dice' and B be the event getting 2 on the second dice. Are the events A and B independent?

Watch Video Solution

23. An urn contains 7 red and 4 blue balls. Two balls are drawn at random with replacement. Find the probability of getting 2 red balls.

Watch Video Solution

24. An urn contains 7 red and 4 blue balls. Two balls are drawn at random with replacement. Find the probability of getting 2 blue balls.



25. An urn contains 7 red and 4 blue balls. Two balls are drawn at random with replacement. Find the probability of getting one red and one blue ball.

Watch Video Solution

26. A husband and his wife appear for an interview for two parts. The probability of husband's selection is $\frac{1}{7}$ and that of wife's selection is $\frac{1}{5}$. What is probability that both of them will be selected?



27. A husband and his wife appear for an interview for two parts. The probability of husband's selection is $\frac{1}{7}$ and that of wife's selection is $\frac{1}{5}$. What is probability that only one of them is selected?

Watch Video Solution

28. A husband and his wife appear for an interview for two parts. The probability of husband's selection is $\frac{1}{7}$ and that of wife's selection is $\frac{1}{5}$. What is probability that none of them will be selected?

Watch Video Solution

29. In a family, the husband tells in a lie in 30% cases and the wife in 35% cases. Find the probability that both contradict each other on the same fact.



30. A speaks truth in 75% of the cases. While B in 90% of the cases. In what percent of cases are they likely to contradict each other in stating in the same fact? Do you think that statement of B is true?



31. Three cards are drawn with replacement from a well shuffled pack of cards. Find the probability of cards drawn are a king, a



32. From a pack of 52 cards, 3 cards are drawn at random. Find

the probability of drawing exactly two aces.



33. A problem in satistics is given to three students whose chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$ or $\frac{1}{4}$ respectively. What is the

probability that only one of them solve it correctly.



34. Two cards are drawn from a well shuffled of 52 cards. One after another without replacement. Find the probability that one of these is a red card and the other a black card.



35. A and B appeared for an interview for two posts. Probability of A selection is $\frac{3}{5}$ and that of B is selection is $\frac{3}{7}$. Find the probabilit that only one of them is selected.

Watch Video Solution

36. Ramesh appears for an interview for two posts A and B for which selection is independent. The probability of his selection

for post A is $rac{1}{6}$ and for post B is $rac{1}{7}$. Find the probability that

Ramesh is selected for at least one of the posts.

Watch Video Solution

37. Tickets are numbered from 1 to 10. two tickets are drawn one after the other at random. Find the probability that the number on one of the tickets is a multiple of 5 and on the other a multiple of 4.



38. A die is thrown twice and the sum of the numbers appearing is observed to be 6. What is the conditional probability that the number 4 has appeared at least once?

39. If a dice is thrown 3 times in succession. What is the probability that

all throws are alike?

Watch Video Solution

40. If a dice is thrown 3 times in succession. What is the

probability that

all throws are alike?



41. What is the chance of throwing an ace in only in first of two

successive throws with an ordinary dice?



42. In a thrown of three dice, find the probability that atleast one dice shows up 1.

Watch Video Solution

43. A bag contains 5 white and 3 black balls. Four balls are successively drawn out without replacement . What is the probability that they are alternately of different colours ?

Watch Video Solution

44. A bag contains 8 red, 3 white and 9 blue balls. If three balls are drawn at random, determine the probability that all the three balls are blue.



45. A bag contains 8 red, 3 white and 9 blue balls. If three balls are drawn at random, determine the probability that all the balls are of different colour.



46. A dice is thrown 3 times and the sum of the 3 numbers thrown is 15. The probability htat the first thrown was a four, is



47. Two drawings, each of 3 balls, are made from a bag containing 5 white balls and 8 black balls, the balls not being

replaced before the second trial. Find the probability that the first drawing will give three white, and the second three black balls.



48. Two drawings each of 3 balls, are made from a bag containing 5 white and 8 black balls, the balls being replaced before the second trial. Find the chance that the first drawing will give 3 white, and the second 3 black balls.

Watch Video Solution

49. In three throws with a pair of dice, find the chance of throwing doublet at least once.

50. In four throws with a pair of dice, what is probability of throwing doublet at least twice .



51. An anti-air craft gun can take maximum four at an enemy plane, moving away from it. The probabilities oh hitting the plane at first, second, third and fourth shot are 0.4, 0.3, 0.2 and 0.1 respectively. What is the probability that the gun hits the plane? Do you agree with us that the success will raise the morale of Indian Army?

Watch Video Solution

52. A card is drawn from a well shuffled deck of 52 cards. The outcome is noted. The card is replaced and the deck reshuffled. Another card is then drawn form the deck. What is the probability that

both the cards are of the same suit?



Watch Video Solution

53. A card is drawn from a well shuffled deck of 52 cards. The outcome is noted. The card is replaced and the deck reshuffled. Another card is then drawn form the deck. What is the probability that

both the cards are aces?



54. A card is drawn from a well shuffled deck of 52 cards. The outcome is noted. The card is replaced and the deck reshuffled. Another card is then drawn form the deck. What is the probability that

the first card is an ace and the second card is a red queen?

Watch Video Solution

55. A card is drawn from a well shuffled deck of 52 cards. The outcome is noted. The card is replaced and the deck reshuffled. Another card is then drawn form the deck. What is the probability that

both are face cards?

Watch Video Solution

56. A bag contains 4 white and 7 black and 5 red balls. 4 balls are drawn one by one with replacelment. What is the probability that at least two are white?

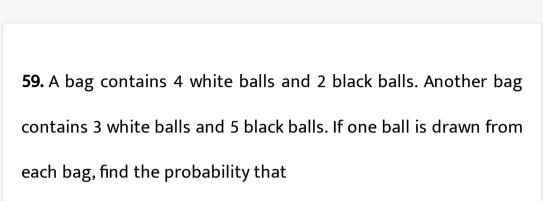
Watch Video Solution

57. A bag contains 17 balls marked with the numbers 1 to 17. a ball is drawn and replaced. A second drawing is then made. What is the probability that the first ball is drawn is even numbered and the second odd numbered?



58. A bag contains 3 red and 5 black balls and second bag contains 6 red and 4 black balls . A ball is drawn from each bag .

Find the probability that one is red and other is black .



both are white.



Watch Video Solution

60. A bag contians 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, find the probability that

both are black.

61. A bag contians 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, find the probability that

one is white and one is black.



62. In bag A , there are 5 white and 8 red balls, in bag B, 7 white and 6 red balls and in bag C, 6 white and 5 red balls. One ball is taken out a random from each bag. Find the probability that all the three balls are of the same colour.



63. One bag contains 5 white and 6 black balls. Another bag contains 7 white and 3 black balls. One ball at random is transferred from the first bag to the second bag and then a ball is drawn from the second bag. Find the probability that the ball drawn is white .



64. one bag contains 6 white and 5 black balls. Another bag contains 5 white and 3 black balls. One ball at random is transferred from the first bag to the second bag and then a ball is drawn from the second bag. Find the probability that the ball drawn is white .



65. A bag contains 4 white and 5 black balls. Another bag contains 9 white and 7 black balls. A ball is transferred from the first bag to the second and then a ball is drawn at random from the second bag. Find the probability that the ball drawn is white.



66. A dice is so biased that it is twice as likely to show an even number as an odd number when thrown. It is thrown twice. What is the probability that he sum of the two numbers thrown is even.



67. A and B take turn in throwing two dice. The first to throw 9 being awarded. Show that if A has the first throw, their chances of winning are in the ratio 9:8.



68. A and B throw a pair of dice alternately, till one of them gets

a total of 10 and wins the game. Find their respective probabilities of winning if A starts first.

Watch Video Solution

69. In a single throw of three dice, find the probability of getting

a total of 5

70. In a single throw of three dice, find the probability of getting

a total of 5

Watch Video Solution

71. One card is drawn at random from a well shuffled deck of 52 cards. In which of the following cases are the events E and F independent ?E : 'the card drawn is a king or queen' F : 'the card drawn is a queen or jack'.



72. One card is drawn from a pack of 52 cards to that each card is equally likely to be selected. In which of the following cases are the events E_1 and E_2 independent?

 E_1 : 'the card drawn is a diamond'

 E_2 :'the card drawn is a queen'.



73. One card is drawn from a pack of 52 cards to that each card is equally likely to be selected. In which of the following cases are the events E_1 and E_2 independent?

 E_1 : 'the card drawn is red'

 E_2 : 'the card drawn is a jack'.

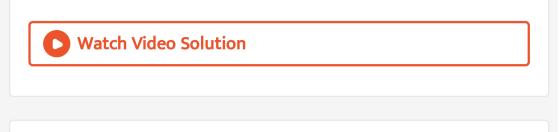
Watch Video Solution

74. State which of the following events are independent. Give reasons for your answer:

 E_1 : 'an even number on first throw'

 E_2 : 'a number multiple of 3 on second throw' in two successive

throws of a dice.



75. State which of the following events are independent. Give reasons for your answer:

 E_1 : '2 tails on first throw'

 E_2 : '2 heads on second throw' in two successive throws of two coins.

Watch Video Solution

76. State which of the following events are independent. Give reasons for your answer:

 E_1 : 'a total of 9 on first throw'

 E_2 : 'a total of 9 on second throw' in two successive throws of a pair of dice.

O Watch Video Solution	

77. Two natural numbers r,s and drawn one at a time, without replacement from the set S={1,2,3,.....,n}. Find the $P\left[r \leq rac{p}{s} \leq p
ight]$, where $p \in S$.

Watch Video Solution

78. There are 2 bag, one of which contains 3 black and 4 white balls, while the other contains 4 black and 3 white balls. A die is cast. If the face 1 or 3 turns up a ball is taken out from the first bag and if any other face turns up, a ball is taken from the second bag. The probability of choosing a black ball, is

79. An urn contains 2 white and 2 black balls. A ball is drawn at random. If it is white, it is not replace into urn, otherwise it is replaced along with another ball of the same colour. The proccess is repeated, find the probability that the third ball drawn is black.

Watch Video Solution

80. A family has two children. What is the probability that both

the children are boys given that at least one of them is a boy?



81. A couple has two children, find the probability that both children are females, if it is known that the elder childis a female.

Watch Video Solution

82. Consider the experiment of tossing a coin. If the coin shows head, toss it again but if it shows tail, then throw a die. Find the conditional probability of the event that the die shows a number greater than 4, given that there is at least one tail.



83. A purse contains 2 silver and 4 copper coins. A second purse contains 4 silver and 3 copper coins. If a coin is pulled at

random from one of the two purses, what is the probability that

it is a silver coin?

Watch Video Solution

84. Bag I contains 3 black and 2 white balls, Bag II contains 2 black and 4 white balls. A bag and then a ball is selected at random. Determine the probability of selecting a black ball.



85. Find the probability of drawing one rupee coin from a purse with two compartments one of which contains 3 fifty paise coins and 2 one rupee coins and the other contains 2 fifty paise coins and 3 one rupee coins.



86. Three bags A,B and C contain 6 red, 4 black and 5 red, 5 black balls and 4red, 6black balls respectively. A bag is selected at random (each of the three bags being equally liekly to be selected and from the the selected bag, a ball is drawn at random. If this ball s found to be red, find the probability that it is drawn from the bag A.

> Watch Video Solution

87. There are three urns containing 2 white and 3 black balls, 3 white and 2 black balls, and 4 white and 1 black balls respectively. There is an equal probability of each urn being chosen. A ball is drawn at random from an urn chosen at random and is found to be white. find the probability that the ball has bee drawn from the second urn.



88. There are two bags I and II. Bag I contains 4 white and 3 red balls while another Bag II contains 3 white and 7 red balls. One ball is drawn at random from one of the bags and it is found to be white. Find the probability that it was drawn from Bag I.

Watch Video Solution

89. A bag X contains 4 white balls and 2 black balls, while another bag Y contains 3 white balls and 3 black balls. Two balls are drawn (without replacement) at random from one of the bags and were found to be one white and one black. Find the probability that the balls were drawn from bag Y.



90. The contents of three bags A, B and C are as follows:

Bag A: 1 white, 2 black and 3 red balls, Bag B: 2 white, 1 black and 1 red balls.

Bag C: 4 white, 5 black and 3 red balls.

A bag is selected at random. Two balls are drawn from the selected bag. if these found to be white and red, find the probability that they have been drawn from

bag A.



91. The contents of three bags A, B and C are as follows:

Bag A: 1 white, 2 black and 3 red balls, Bag B: 2 white, 1 black and

1 red balls.

Bag C: 4 white, 5 black and 3 red balls.

A bag is selected at random. Two balls are drawn from the selected bag. if these found to be white and red, find the probability that they have been drawn from

bag B.

Watch Video Solution

92. In a bolt factory, machines A, B and C manufacture respectively 25%, 35%, 40% of the total. Of their output 5,4 and 2% are defective. A bolt is drawn at random from the product. What is the probability that the bolt drawn is defective?



93. In a tape recorder factory, three machines A, B and C produced 25%, 35% and 40% respectively. The percentage of

defective output of these machines are 5%, 4% and 2% respectively. A tape recorder is selected at random and is found to defective. Find the probability that tape recorder is produced by machine B .



94. In a bolt factory, machines A, B and C manufacture respectively 25%, 35%, 40% of the total. Of their output 5,4 and 2% are defective. A bolt is drawn at random from the product. What is the probability that the bolt drawn is defective?



95. An item is manufacture by three machines A, B and C. out of the total number of items manufactured during a specified

period, 50% are manufactures on A. 30% on B and 20% on C. 2% on the items produced on A and 2% of items produced on B are defective, and 3% of these produced on C are defective. All the items are stored at one godown. One item is drawn at random and is found to be defective. what is the probability that it is manufactured on machine A?



96. Three machines E_1 , E_2 , E_3 in a certain factory produce 50%, 25% and 25% respectively of the total daily output of electric tubes. It is known that 4% of the tubes produced by each of machines E_1 and E_2 are defective, and that 5% of those produced on E_3 are defective. If one tube is picked up at random from a day's production, calculate the probability that it is defective. **97.** Three machines E_1 , E_2 , E_3 in a certain factory produce 50%, 25% and 25% respectively of the total daily output of electric tubes. It is known that 4% of the tubes produced by each of machines E_1 and E_2 are defective, and that 5% of those produced on E_3 are defective. If one tube is picked up at random from a day's production, calculate the probability that it is defective.



98. An insurance company insured 3000 scooters, 4000 cars and 5000 trucks. The probabilities of an accident involving a scooter, a car and a truck are 0.02, 0.03, 0.04 respectively. One of the

insured vehicles meets with an accident. Find the probability that it is a car.

Watch Video Solution

99. An insurance company insured 3000 scooters, 4000 cars and 5000 trucks. The probabilities of an accident involving a scooter, a car and a truck are 0.02, 0.03, 0.04 respectively. One of the insured vehicles meets with an accident. Find the probability that it is a car.

Watch Video Solution

100. An insurance company insured 3000 scooters, 4000 cars and 5000 trucks. The probabilities of an accident involving a scooter, a car and a truck are 0.02, 0.03, 0.04 respectively. One of the insured vehicles meets with an accident. Find the probability that it is a car.



101. Three bags contains a balls as shown in the following table:

Bag		Number of					
	White balls	Black balls	Red balls				
I	1	2	3				
11	2	· · · · · ·	1				
111	4	3	2				

A bag is selected at random and two balls are drawn. They happen to the white and red. What is the probability that they come from the third bag.



102. Bag I contains 3 red and 4 black balls and Bag II contains 4 red and 5 black balls. One ball is transferred from Bag I to Bag II and then a ball is drawn from Bag II. The ball so drawn is found to be red in colour. Find the probability that the transferred ball is black



103. A car manufacturing factory has to plant s X and Y. Plan X manufacturers 70% of the cars plant Y manufactures 30%. 80% of the cars at plant X and 90% of the cars at plant Y are rated of standard quality. A car is chosen at random and is found to be of standard quality what is the probability that it comes from plant X



104. Suppose you have two coins which appear identical in your pocket. You know that one coin is fair and the other is 2 handed. If you take out one coin, toss it and get and a head, what is the probability that it is a fair coin?

Watch Video Solution

105. A bag contains (2n +1) coins. It is known that n of these coins have a head on both side whereas the rest of the coins are fair A coin is plaked up at random from the bag and is tossed. If the probability that the toss results in a head is $\frac{31}{42}$, deter8mine the value of n.

106. A letter is known to have come from TATANAGAR or from CALCUTTA. On the envelope, just two consecutive letter. TA are visible. What is the probability that the letter had cone from TATANAGAR?

Watch Video Solution

107. Suppose that 6% of the perons with blood group O are left handed and 10% of those with other blood groups are left handed. It is given that 30% of the persons have blood group O. if a left handed person is selected at random. What is the probability that the person has blood group O.

108. By examining the chest X-ray, the probabilisity that TB is detected when a person is actually suffering is 0.99. the probability of a healthy person diagonosed to have TB is 0.001. In a certain city, 1 in 1000 persons suffer from TB. A perons is selected at random and is diagonosed to have TB. what is the probability that the actual suffers from TB?



109. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by other means of transport are respectively $\frac{3}{10}, \frac{1}{5}, \frac{1}{10}$ and $\frac{2}{5}$. The probabilities that he will be late are $\frac{1}{4}, \frac{1}{3}, \frac{1}{12}$, if he comes by train, bus and scooter respectively, but if he comes by other means of transport, then he will not be

late. When he arrives, he is late. What is the probability that he

comes by train?

Watch Video Solution

110. A shopkeeper sells three types of flower seeds A_1, A_2 and A_3 . They are sold as a mixture whereas the proportions are 4:4:2 respectively. The germination rates of the three types of the seeds are 45%, 60%, 35%. Find the probability of a randomly chosen seed to germinate.

Watch Video Solution

111. A shopkeeper sells three types of flower seeds A_1, A_2 and A_3 . They are sold as a mixture whereas the proportions are 4:4:2 respectively. The germination rates of the

three types of the seeds are 45%, 60%, 35%. Find the probability

that it will be not geminate given that it is of the type A_3 .



112. A shopkeeper sells three types of flower seeds A_1 , A_2 and A_3 . They are sold as a mixture whereas the proportions are 4:4:2 respectively. The germination rates of the three types of the seeds are 45%, 60%, 35%. Find the probability that it is of type A_2 given that a randomly chosen seed does not germinate.



113. If a machine is correctly set up, it produces 90% acceptable items. If it is incorrectly set up, it produces only 40% acceptable

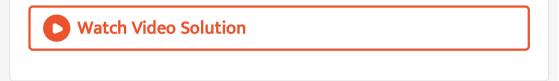
items. Past experience shows that 80% of the set ups are correctly done. If after a certain set up, the machine produces 2 acceptable items, find the probability that the machine is correctly setup.



114. A girl throws a die. If she gets 5 or 6, tosses a coin three times and notes the number of heads. If she gets 1,2,3 or 4, she tosses a coin two times and notes the number of heads. If she obtained exactly two heads, what is the probability that she throws 1,2,3 or 4 with the die.



115. Find the probability distribution of a random variable X which denotes the number of tails in two tosses of a coin.



116. Find the mean and variance of the number of heads on the

throw of three coins.



117. A dice is rolled thrice. If getting a four is considered a success, find the mean and the variance of the probability distribution of the number of success.



118. Find the probability distribution of the number of successes in two tosses of a die, where a success is defined as : number greater than 4



119. Two dice are thrown simultaneously. If X denotes the numbers of sixes obtained, find probability distribution of X and also is mean and variance.



120. Two cards are drawn with replacement from a well shuffled

deck of 52 cards. Find μ and σ for the numebr of queens drawn.



121. Two cards are drawn one after the other from a well shuffled pack of 52 cards. Find the mean and variance of the number of red cards.

Watch Video Solution

122. An urn contains 4 white and 3 red balls. Find the probability distribution of the number of red balls in three draws, with replacement from an urn.

Watch Video Solution

123. Four balls are to be drawn without replacement from a box containing 8 red and 4 white balls. If X denotes the number of red balls drawn, find the probability distribution of X.



124. Four defective oranges are accidently mixed with 16 good ones and by looking at them it is not possible to differentiate between them. Three oranges are drawn at random from the lot. Find the probability distribution of X, the number of defective oranges.

Watch Video Solution

125. A bag contains 2 white , 3 red and 4 blue balls. Two balls are drawn at random from the bag . If the random variable X denotes the number of white balls among the two balls drawn, describe the probability distribution of X:

126. Calcuate the mean variance and standard deviation of a number obtained as a result of throwing.

an unbiased die.



127. Calcuate the mean, variance and standard deviation of

number of heads in two tosses of a coin.



128. A die is tossed once. Let a random variable X be defined as

 $X = \left\{egin{array}{ccc} 0 & ext{if} & the dices how sanod d
umber \ 1 & ext{if} & the dices how sane ven
umber \end{array}
ight.$

Find the probability distribution of X. Also find the mean and

variance.



129. From a lot of 30 bulbs which include 6 defectives, a sample of 4 bulbs is drawn at random with replacement. Find the probability distribution of the number of defective bulbs.



130. A coin is biased so that the head is 3 times as likely to occur as tail. If the coin is tossed twice, find the probability distribution of number of tails.



131. Two bad eggs are mixed accidently with 10 good ones. Find the probability distribution of the number of bad eggs in 3 eggs drawn at random in succession, without replacement fro a lot. Find the mean number of bad eggs drawn.

Watch Video Solution

132. Find the variance of the distribution:

x	0	1	2	3	4	5
P(X)	$\frac{1}{6}$	$\frac{5}{18}$	$\frac{2}{9}$	$\frac{1}{6}$	$\frac{1}{9}$	$\frac{1}{18}$

133. Consider the probability distribution of a random variable

X:

X	0	1	2	3	4
P(X)	0.1	0.25	0.3	0.2	0.15

Compute

variance (X).

Watch Video Solution

134. Consider the probability distribution of a random variable

X:

Х	0	1	2	3	4
P(X)	0.1	0.25	0.3	0.2	0.15

Compute

$$V\left(\frac{X}{2}\right)$$



135. Two probability distribution of the discrete random variables X and Y are given below:

X	0	1	2	3
P(X)	$\frac{1}{5}$	25	$\frac{1}{5}$	$\frac{1}{5}$

Y	0	1	2	3
P(Y)	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$	$\frac{1}{10}$

Prove that $E(Y^2) = 2E(X)$.

Watch Video Solution

136. The probability distribution of a random variable X is given

below:

Y	0	1	2	3
P(X)	k	$\frac{k}{2}$	$\frac{k}{4}$	$\frac{k}{8}$

find the value of k.

Watch Video Solution

137. The probability distribution of a random variable X is given

below:

Y	0	1	2	3
P(X)	k	$\frac{k}{2}$	$\frac{k}{4}$	$\frac{k}{8}$

Compute $P(X \leq 2)$



138. The probability distribution of a random variable X is given

below:

Y	0	1	2	3
P(X)	k	$\frac{k}{2}$	$\frac{k}{4}$	$\frac{k}{8}$

Determine P(X>2).

Watch Video Solution

139. The probability distribution of a random variable X is given

below:

Y	0	1	2	3
P(X)	k	$\frac{k}{2}$	$\frac{k}{4}$	$\frac{k}{8}$

 ${\sf Calcuate}\ P(X\leq 2)+P(X>2)$

140. The random variable X can take the values 0, 1, 2 only. Give that P(X = 0) = P(X = 1) = p and that $E(X^2) = E(X)$, find the value of p.

Watch Video Solution

141. Two biased dice are thrown together. For the first dice $P(6) = \frac{1}{2}$, the other scores being equally likely while for the second dice, $P(1) = \frac{2}{5}$ and the other scores are equally likely. Find the probability distribution of the number of ones shows.

142. A pair of dice is rolled twice. Let X denote the number of times, 'a total of 9 is obtained'. Find the mean and variance of the random variable X.



143. Let X be a discrete random variable whose probability

distribution is defined as follows:

$$P(X=x) = egin{cases} k(x+1) & for(x=1,2,3,4)\ 2kx & for(x=5,6,7)\ 0 & otherwise \end{cases}$$

where k is constant, Calculate the vlaue of k.

Watch Video Solution

144. Let X be a discrete random variable whose probability

distribution is defined as follows:

$$P(X=x) = egin{cases} k(x+1) & for(x=1,2,3,4) \ 2kx & for(x=5,6,7) \ 0 & otherwise \end{cases}$$

where k is constant, Calculate E(X).



145. Let X be a discrete random variable whose probability distribution is defined as follows:

$$P(X=x) = egin{cases} k(x+1) & for(x=1,2,3,4)\ 2kx & for(x=5,6,7)\ 0 & otherwise \end{cases}$$

where k is constant, Calculate Standard deviation of X



146. The probability distribution of a random variable X is given

as under:

$$P(X=x)= egin{cases} kx^2 & for(x=1,\,2,\,3,\,4)\ 2kx & for(x=5,\,6,\,7)\ 0 & otherwise \end{cases}$$
 where k is a

constant. Calculate

 $P(X \ge 4)$

Watch Video Solution

147. The probability distribution of a random variable X is given

as under:

$$P(X=x) = \left\{egin{array}{cc} kx2 & for(x=1,\,2,\,3,\,4)\ 2kx & for(x=5,\,6,\,7)\ 0 & otherwise \end{array}
ight.$$
 where k is a constan.

Calculate

 $E(3X^2)$

148. The probability distribution of a random variable X is given

as under:

$$P(X=x)= egin{cases} kx^2 & for(x=1,\,2,\,3,\,4)\ 2kx & for(x=5,\,6,\,7)\ 0 & otherwise \end{cases}$$
 where k is a

constant. Calculate

 $P(X \ge 4)$



149. A discrete random variable X has the following probability

distribution:

	_								
х	0	1	2	3	4	5	6	7	
P(X)	0	k	2 k	2 k	3 k	k ²	2 k ²	$7k^2 + k$	

Determine

value of k.

150. A discrete random variable X has the following probability

distribution:

х	0	1	2	3	4	5	6	7
P(X)	0	k	2 k	2 k	3 k	k ²	2 k ²	$7k^2 + k$

Determine

Mean X.

Watch Video Solution

151. A discrete random variable X has the following probability

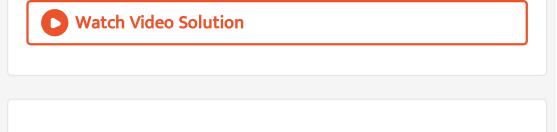
processing wast

distribution:

		_								
1	X	0	1	2	3	4	5	6	7	
	P(X)	0	k	2 k	2 k	3 k	k ²	2 k ²	$7k^2 + k$	

Determine

P(X<3)



152. A discrete random variable X has the following probability

distribution:

х	0	1	2	3	4	5	6	7
P(X)	0	k	2 k	2 k	3 k	k ²	2 k ²	$7k^2 + k$

Determine

P(X>6)



153. A discrete random variable X has the following probability

distribution:

x	0	1	2	3	4	5	6	7	
P(X)	0	k	2 k	2 k	3 k	k ²	2 k ²	$7k^2 + k$	

Determine

P(0 < X < 3)



154. Three numbers are selected at random (without replacement) from first 6 positive integers. Let X denote the largest of the three numbers obtained. Find the probability distribution of X. Also, find the mean and variance of the distribution.

Watch Video Solution

155. Three numbers are selected at random (without replacement) from first 6 positive integers. Let X denote the largest of the three numbers obtained. Find the probability

distribution of X. Also, find the mean and variance of the distribution.

O Watch Video Solution

156. A dice is thrown 120 times and getting '1' or '5' is considered a success. Find the mean and the variance of the number of success.



157. Find the mean and the variance of random variable X which is the number of successes in two tosses of a dice, where a success is defined as a number greater than 4.



158. Find the mean and variance of the number of heads on the

throw of three coins.



variance of the number of heads obtained.

Watch Video Solution

160. An unbiased coin is tossed 4 times. Find the mean and variance of the number of heads obtained.

161. Ten coins are thrown simultaneously. Find the probability of

getting at least 7 heads.



162. A dice is rolled thrice. If getting a four is considered a success, find the mean and the variance of the probability distribution of the number of success.



163. Two cards are drawn with replacement from a well shuffled

deck of 52 cards. Find μ and σ for the numebr of aces.



164. An urn contains 4 white and 3 red balls. Find the probability distribution of the number of red balls in three draws, with replacement from an urn.

Watch Video Solution

165. A coin is tossed 5 times. What is the probability that head

appears

an even number of times.

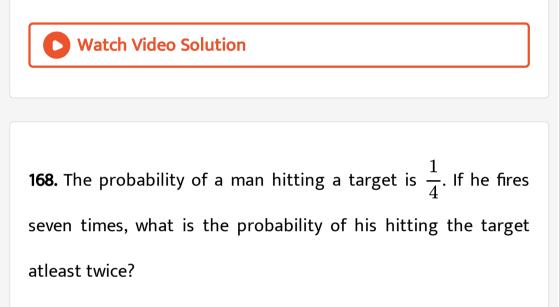
Watch Video Solution

166. A coin is tossed 5 times. What is the probability that head

appears on odd number of times?

167. Using binomial distribution find the probability of obtaining

"less than 3 heads" when an unbiased coin is tossed 6 times.





169. In a hurdle race, a player has to cross 10 hurdles. The probability that he will clear each hurdle is $\frac{5}{6}$. What is the probability that he will knock down fewer than 2 hurdles?

170. A bag contains 10 balls each marked with one of the digit is 0 to 9. If 4 balls are drawn successively with replacement from the bag. What is the probability that none is marked with the digit is 0?



171. Find the probability distribution of the number of doublets

in four throws of a pair of dice.



172. Find the probability distribution of number of doublets in

three throws of a pair of dice.





173. Three cards are drawn in succession form a well shuffled pack of 52 cards. Determine the probability distribution of the random variable X which denotes the number of spades in the three cards. Hence find the mean of the distribution.



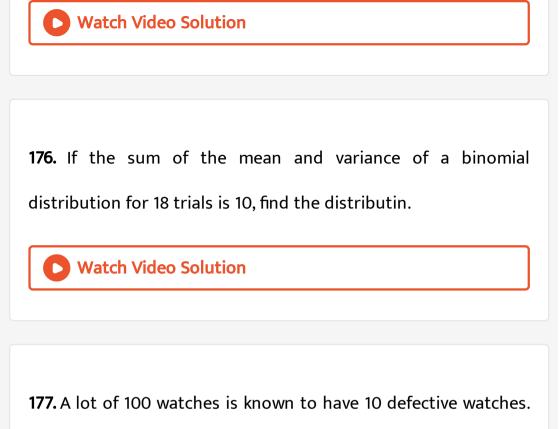
174. Determine the binomial distribution whose mean is 10 and

whose standard deviation is 8.



175. If the sum of mean and variance of a binomial distribution

is 4.8 for five trials, find the distribution.



If 8 wathces are selected at random, what is the probability that

there will be atelast one defective watch?



178. A pair of dice is thrown 7 times if getting a total of 7 is considered a success, what is the probability of at most 6



179. A bag contains 7 red, 4 white and 5 black balls. If four balls

are drawn one by one the replacement, what is the probability

that

only two are white?



180. If getting '5' or '6' in a throw of an unbiased dice is a success and the random variable 'X' denotes the number of success in six throws of the dice, find P(Xge4).



181. A bag contains 4 white and 7 black and 5 red balls. 4 balls are drawn one by one with replacelment. What is the probability that at least two are white?

Watch Video Solution

182. The sum of mean and variance of a binomial distribution is

18 and sum of their squares is 164. find the distribution.



183. A box contains 100 tickets each bearing one of the numbers from 1 to 100. if 5 tickets are drawn successively with replacement from the box, find the probability that all the tickets bear numbers divisible by 10.



184. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that all will bear 'X' mark.

Watch Video Solution

185. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that not more than 2 will bear 'Y' mark. **186.** An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that the number of balls with 'X' mark and 'Y' mark will be equal.



187. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that at least one ball will bear 'Y' mark.



188. A factory produces bulbs. The probability that any one bulb is defective is $\frac{1}{50}$ and they are packed in boxes of 10. From a sigle box, find the probability that none of bulb is defective.

Watch Video Solution

189. A factory produces bulbs. The probability that any one bulb is defective is $\frac{1}{50}$ and they are packed in boxes of 10. From a sigle box, find the probability that

exactly two bulbs are defective.

Watch Video Solution

190. A factory produces bulbs. The probability that any one bulb is defective is $\frac{1}{50}$ and they are packed in boxes of 10. From a

sigle box, find the probability that

more than 8 bulbs work properly.

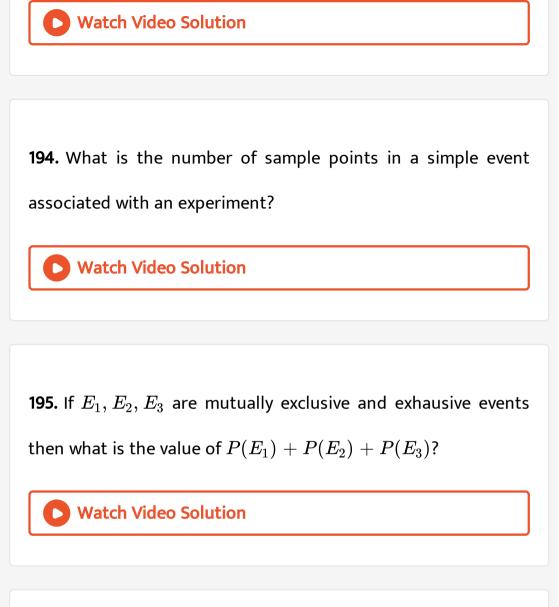
191. A factory produces bulbs. The probability that any one bulb is defective is $\frac{1}{50}$ and they are packed in boxes of 10. From a sigle box, find the probability that none of bulb is defective.



192. What is the probability of sure event ?



193. The probability of an impossible event is



196. If E is an event associated with an experiment, find the value of $P(E) + P(E^c)$.

197. A two digit number is selected at random. Find the number

selected is an odd number.



198. A letter from the English alphabet is seleted at random.

Find the chance that it is a vowel.



199. E_1 and E_2 are equally likely events associated with an experiment. If $P(E_1) = p$ what is the probability of E_2 ?



200. If E_1 and E_2 are independent events associated with an experiment and $P(E_1 \cap E_2) = \lambda P(E_1)P(E_2)$, then what is down the value of λ .

Watch Video Solution

201. If E_1 and E_2 are mutually exclusive, then write down the value of $P(E_1 \cap E_2)$.

Watch Video Solution

202. If E_1 and $E_2 = \phi$ are any two events associated with an experiment and $\lambda P(E_1 \cap E_2) = P(E_1/E_2)$, then write down the value of λ .

203. A decimal numeral from (0,1,2,3,4,5,6,7,8,9) is selected at random. Find the chance it is a prime number.

Watch Video Solution

204. If
$$P(E_2) = \frac{1}{9}$$
, $P(E_2/E_1) = \frac{3}{5}$, $P(E_1/E_2) = \frac{3}{4}$ then find $P(E_1)$.



205. If E_1 and E_2 mutually exclusive, then find $P(E_1/E_2)$.



206. If E_1 and E_2 are independent events such that $P(E_1)=rac{1}{3}$ and $P(E_2)=rac{1}{6}$ find $Pig(E_1^c\cap E_2^cig).$

Watch Video Solution

207. The probability of occurrence of an event A is 0.5 and that of B is 0.3. If A and B are mutually exclusive events, then the probability of netiher A nor B is:



208. If X is the numebr of tails in three tosses of a coin, determine the standard deviation of X.



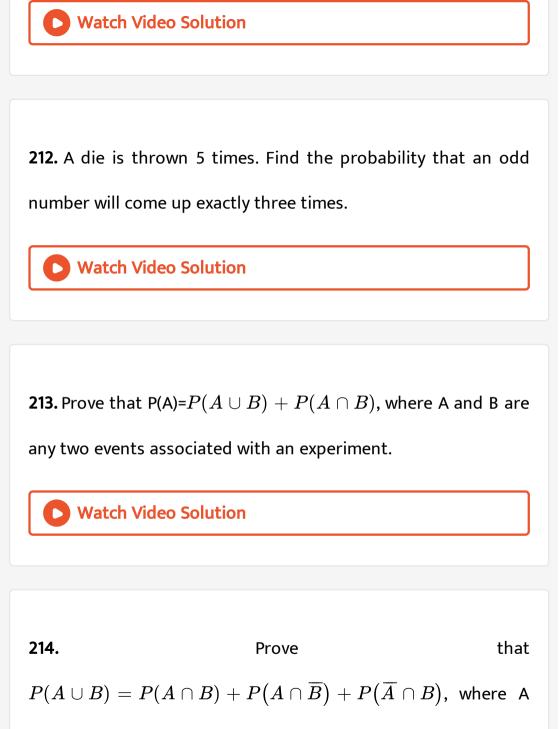
209. A bag contains 5 red marbles and 3 black marbles. Three marbles are drawn one by one without replacement. What is the probability that at least one of three marbles drawn be black if the first marble is red?

Watch Video Solution

210. Three dice are thrown at the same time. Find the probability of getting three two's, if it is known that the sum of the numbers on the dice was six.

Watch Video Solution

211. Four cards are successively drawn without replacement from a deck of 52 playing cards. What is the probability that all the four cards are kings?



and B are any two events associated with an experiment.



215. A box has 5 blue and 4 red balls. One ball is drawn and not replaced. It colour is also not noted. Another ball is then drawn at random. What is the probability of second ball being blue.

Watch Video Solution

216. If
$$P(A) = \frac{2}{5}$$
, $P(C) = \frac{1}{2}$ and $P(A \cap C) = \frac{1}{5}$ then find $P(A' \cap C')$.



217. Find k, if the probability distribution of a random variable X is as follows:

x	0	$c_{0}1_{\mathrm{prin}}$	2	3	est.
P (X)	k	3 k	3 k	k	

Watch Video Solution

218. Find the mean of the following probability distribution of a

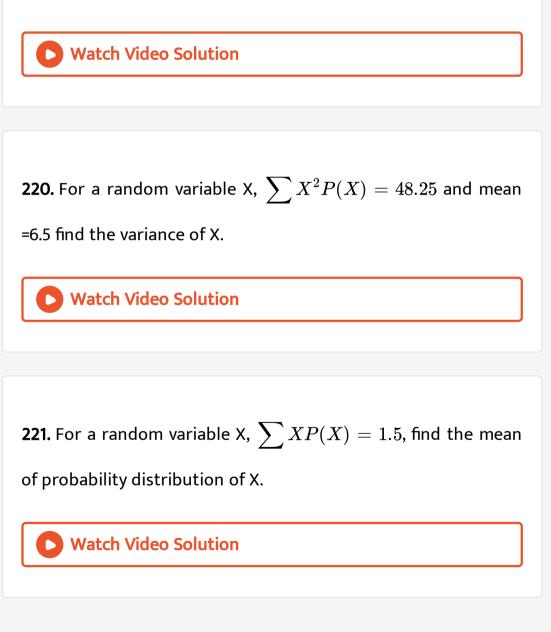
random variable X

x	0	51	2
P (X)	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$



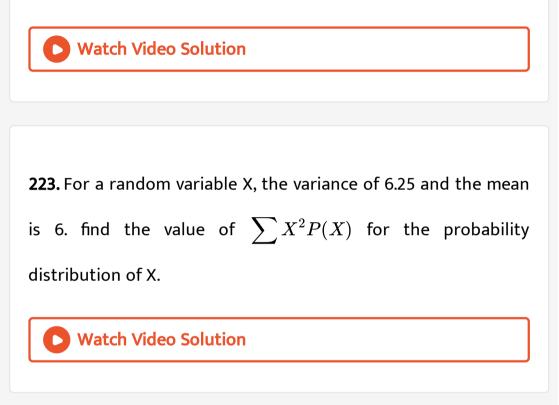
219. For a Binomial disribution mean is 5 and the number of

trials is 50, find the variance.



222. A bag contains 3 white and 5 black balls. A ball is drawn at

random. Find the chance that it is a black ball.



224. If E_1 and E_2 are independent events and $P(E_1) =
ho_1$, $P(E_2) =
ho_2$ then find $P(E_1 \cup E_2)$.

225. If E_1 and E_2 are independent events and $P(E_1)=
ho_1$, $P(E_2)=
ho_2$ then find $Pig(E_1^c\cap E_2^cig).$



226. A coin is tossed twice. Let X denotes of the number of times

'head' tunrs up. Write down the probability distribution of X.

Watch Video Solution

227. A and B are two candidates seeking admission in a college. The probability that A is selected is 0.7 and the probability that exactly one of them is selected is 0.6. find the chance that B is selected if the admission of one candidate is independent of the other.





228. Two dice are thrown together. Let A be the event 'getting 6 on the first dice' and B be the event getting 2 on the second dice. Are the events A and B independent?

Watch Video Solution

229. Explain why the experiment of tossing a coin three times is said to have binomial distribution.

Watch Video Solution

230. In a dice game, a player pays a stake of Rs.1 for each throw of the dice. He receives Rs.5 if the dice shows up 3, Rs.2 if the

dice shows 1 or 6, and noticing otherwise. What is the player's

expected profit per throw over a long series of throws?

Watch Video Solution	

231. A die is thrown thrice. Let X be 'the number of two's seen'.

Find expectation of X.

Watch Video Solution

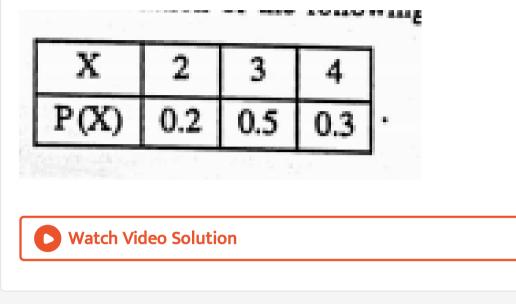
232. A die is tossed twice. A 'success' is getting an even number

on a toss. Find the variance of number of successes.



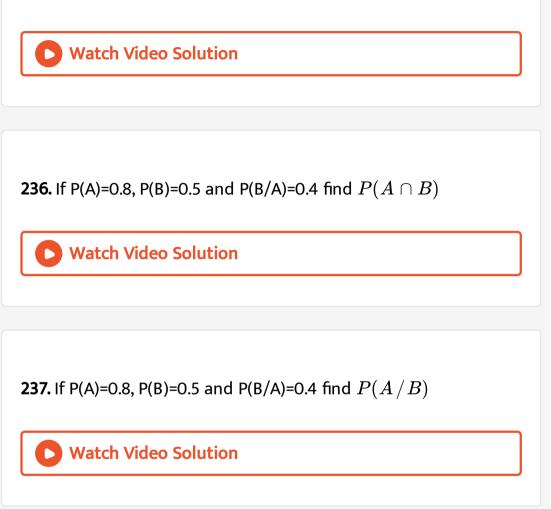
233. Find the standard deviation of the following probability

distribution



234. Given that E and F are events such that P(E)=0.6, P(F)=0.3 and $P(E\cap F)=0.2$ find $P(E\mid F)$ and $P(F\mid E)$

235. Compute P(A/B) if P(B)=0.4 and $P(A \cap B) = 0.32$.



238. If P(A)=0.8, P(B)=0.5 and P(B/A)=0.4 find $P(A \cup B)$.

239. Evaluate $P(A\cup B)$, if $2P(A)=P(B)=rac{5}{13}$ and $P(A/B)=rac{2}{5}$.

Watch Video Solution

240. If
$$P(A) = \frac{6}{13}$$
 and $P(B) = \frac{7}{13}$ and $P(A \cup B) = \frac{9}{13}$ find $P(A \cap B)$

Watch Video Solution

241. If
$$P(A) = \frac{6}{13}$$
 and $P(B) = \frac{7}{13}$ and $P(A \cup B) = \frac{9}{13}$ find $P(A/B)$

242. If $P(A) = rac{6}{13}$ and $P(B) = rac{7}{13}$ and $P(A \cup B) = rac{9}{13}$ find P(B/A)



243. Determine P(E/F)

A coin is tossed three times

E: head on third toss

F: heads on first two tosses.

> Watch Video Solution

244. Determine P(E/F)

A coin is tossed three times

E: atleast two heads

F: atmost two heads.

Watch Video Solution

245. Determine P(E/F)

A coin is tossed three times

E: atmost two tails

F: atleat one tail.

Watch Video Solution

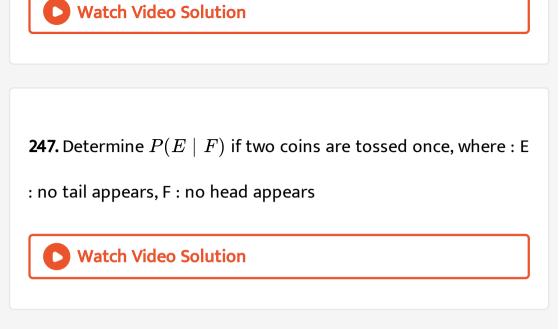
246. Determine P(E/F)

Two coins are tossed once

E: tail appears on one coin

F: one cooin shows head.





248. Determine $P(E \mid F)$ if A die is thrown three times, where :

E: 4 appears on the third toss, F: 6 and 5 appears respectively

on first two tosses



249. Determine $P(E \mid F)$ Mother, father and son line up at random for a family picture :E : son on one end, F : father in



250. A black and a red dice are rolled :Find the conditional probability of obtaining a sum greater than 9, given that the black die resulted in a 5.

Watch Video Solution

251. A black and a red dice are rolled: Find the conditional probability of obtaining the sum 8, given that the red die resulted in a number less than 4.

252. A fair die is rolled. Consider events E={1,3,4,5}, F={2,3,6} and

G={2,3,4,5}. Find

P(E/F) and P(F/E).

Watch Video Solution

253. A fair die is rolled. Consider events E={1,3,5}, F={2,3} and G=

{2,3,4,5}. Find

P(E/G) and P(G/E)

Watch Video Solution

254. A fair die is rolled. Consider events $E = \{1, 3, 5\}, F = \{2, 3\},$ and $G = \{2, 3, 4, 5\}$ find : $P(E \cup F \mid G)$ and $P(E \cap F \mid G)$



255. Assume that each born child is equally likely to be a boy or a girl. If a family has two children, what is the conditional probability that both are girls given that the youngest is a girl.



256. Assume that each born child is equally likely to be a boy or a girl. If a family has two children, what is the conditional probability that both are girls given that at least one is a girl?



257. An instructor has a question bank consisting of 300 easy

True / False questions, 200 difficult True / False questions, 500

easy multiple choice questions and 400 difficult multiple choice questions. If a question is selected at random from the question bank, what is the probability that it will be an easy question given that it is a multiple choice question?



258. Given that the two numbers appearing on throwing two dice are different. Find the probability of the event the sum of numbers on the dice is 8.

Watch Video Solution

259. Consider the experiment of throwing a die, if a multiple of 3 comes up, throw the die again and if any other number comes,

toss a coin. Find the conditional probability of the event 'the

coin shows a tail', given that 'at least one die shows a 3'.

Watch Video Solution

260. If
$$P(A) = rac{1}{2}, P(B) = 0$$
 then $P(A \mid B)$ is :

A. 0

B.
$$\frac{1}{2}$$

C. not defined

D. 1

Answer:

261. If A and B are two events such that $A \cap B \neq \phi, P\left(\frac{A}{B}\right) = P\left(\frac{B}{A}\right)$. Then.

A.
$$A \subset Bbut A
eq B$$

B. A=B

 $\mathsf{C}.\,A\cap B=\phi$

D. P(A)=P(B)

Answer:

Watch Video Solution

262. If
$$P(A)=rac{3}{4}$$
 and $P(B)=rac{1}{4},$ find $P(A\cap B)$ if A and B

are independent events.

263. Two cards are drawn at random and without replacement from a pack of 52 playing cards. Find the probability that both the cards are red.

Watch Video Solution

264. A box of oranges is inspected by examining three randomly selected oranges drawn without replacement. If all the three oranges are good, the box is approved for sale, otherwise, it is rejected. Find the probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale.



265. A fair coin and an unbiased die are tossed. Let A be the event 'head appears on the coin' and B be the event '3 on the die'. Check whether A and B are independent events or not.

Watch Video Solution

266. Let E and F be events with
$$P(E) = \frac{4}{5}$$
, $P(F) = \frac{4}{10}$ and $P(E \cap F) = \frac{1}{5}$. Are E and F independent?

Watch Video Solution

267. Given that the events A and B are such that $P(A) = \frac{1}{2}$, $P(A \cup B) = \frac{3}{5}$ and P(B) = p. find p if they are

mutually exclusive.

268. Given that the events A and B are such that $P(A) = \frac{1}{2}$, $P(A \cup B) = \frac{3}{4}$ and P(B)=p. find p if they are

independent.

Watch Video Solution

269. Let A and B are be independent events with P(A)=0.2 and

P(B)=0.3 find

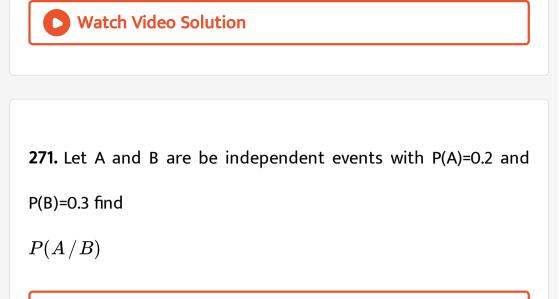
 $P(A \cap B)$

Watch Video Solution

270. Let A and B are be independent events with P(A)=0.2 and

P(B)=0.3 find

 $P(A \cup B)$



Watch Video Solution

272. Let A and B are be independent events with P(A)=0.2 and

P(B)=0.3 find

P(B/A)



273. If A and B are two events such that
$$P(A) = \frac{1}{4}, P(B) = \frac{1}{2}$$
 and $P(A \cap B) = \frac{1}{8}$ find $P(\neg A \text{ and } \neg B)$

Watch Video Solution

274. Events A and B are such that $P(A) = \frac{1}{2}$, $P(B) = \frac{7}{12}$ and P(not A or not B) $= \frac{1}{4}$. State whether A and B are independent.

Watch Video Solution

275. Give two independent events A and B such that P(A)=0.3,

P(B)=0.4. Find

P(A and B)

276. Give two independent events A and B such that P(A)=0.3,

P(B)=0.4. Find

P(A and not B)

Watch Video Solution

277. Give two independent events A and B such that P(A)=0.3,

P(B)=0.4. Find

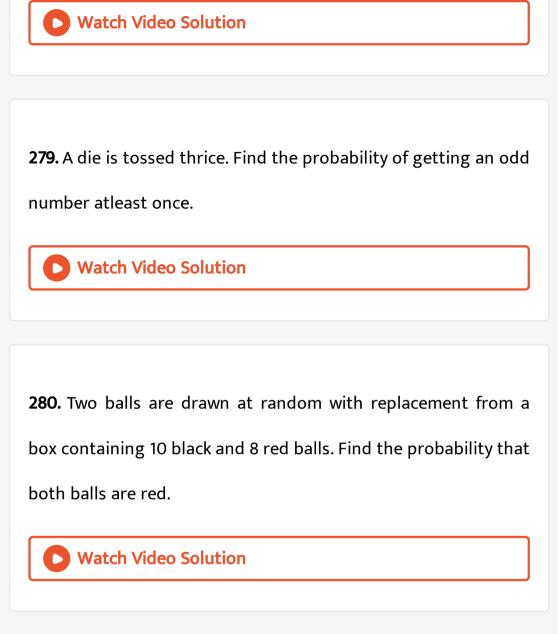
P(A or B)

Watch Video Solution

278. Give two independent events A and B such that P(A)=0.3,

P(B)=0.4. Find

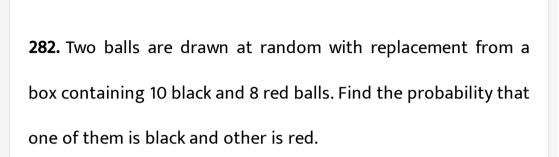
P(neither A nor B)



281. Two balls are drawn at random with replacement from a box containing 10 black and 8 red balls. Find the probability that

first ball is black and second is red.

Watch Video Solution



Watch Video Solution

283. Probability of solving specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that the problem is solved.

Watch Video Solution

284. Probability of solving specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently find the probability that exactly one of them solve the problem.

Watch Video Solution

285. One card is drawn at random from a pack of well shuffled deck of 52 cards. IN which of the following cards are the events E and F independent? : E: the card drawn is spade F: the card drawn is an ace



286. One card is drawn at random from a well shuffled deck of 52 cards. In which of the following cases are the events E and F independent ?E : 'the card drawn is black' F : 'the card drawn is a king'



287. One card is drawn at random from a well shuffled deck of 52 cards. In which of the following cases are the events E and F independent ?E : 'the card drawn is a king or queen' F : 'the card drawn is a queen or jack'.



288. In a hostel, 60% of the students read Hindi news paper, 40% read English news paper and 20% read both Hindi and English news papers. A student is selected at random. Find the probability that she reads neither Hindi nor English news papers.



289. In a hostel, 60% of the students read Hindi newspaper, 40% read English newspaper and 20% read both Hindi and English news paper. A student is selected at random. If she reads Hindi newspaper, find the probability that she reads English newspaper.



290. In a hostel, 60% of the students read Hindi newspaper, 40% read English newspaper and 20% read both Hindi and English news paper. A student is selected at random. If she reads English newspaper, find the probability that she reads Hindi newspaper.

Watch Video Solution

291. The probability of obtaining an even prime number on each die, when a pair of dice is rolled is :

A. 0
B.
$$\frac{1}{3}$$

C. $\frac{1}{10}$

D.
$$\frac{12}{36}$$

Answer:



292. Two events A and B are said to be independent if

A. A and B are mutually exclusive

B.
$$P(A'B') = [1 - P(A)][1 - P(B)]$$

C. P(A)=P(B)

D. P(A)+P(B)=0

Answer:



293. An urn contains 5 red and 5 black balls. A ball is drawn at random, its colour is noted and is returned to the urn. Moreover, 2 additional balls of the colour drawn are put in the urn and then a ball is drawn at random. What is the probability that the second ball is red?



294. A bag contains 4 red and 4 black balls, another bag contains 2 red and 6 black balls. One of the two bags is selected at random and a ball is drawn from the bag which is found to be red. Find the probability that the ball is drawn from the first bag.



295. Of the students in a college, it is known that 60% reside in hostel and 40% are day scholars (not residing in hostel). Previous year results report that 30% of all students who reside in hostel attain A grade and 20% of day scholars attain A grade in their annual examination. At the end of the year, one student is chosen at random from the college and he has an A grade, what is the probability that the student is a hostlier?

Watch Video Solution

296. In answering a question in a multiple choice test a student either knows the answer or guesses. Let $\frac{3}{4}$ be the probability that he knows the answer and $\frac{1}{4}$ be the probability that he guesses. Assuming that a student who guesses at the answer will be correct with probability $\frac{1}{4}$. What is the probability that

a student knows the answer, given that he answered it correctly

?

Watch Video Solution

297. A laboratory blood test is 99% effective in detecting a certain disease when it is in fact, present. However, the test also yields a false positive result for 0.5% of the healthy person tested (i.e. if a healthy person is tested, then, with probability 0.005, the test will imply he has the disease). If 0.1 percent of the population actually has the disease, what is the probability that a person has the disease given that his test result is positive ?

Watch Video Solution

298. There see three coins,one is a two headed coin (having head on both the faces),another is a biased coin that comes up heads 75% of the time and the third is anunbiased coin.One of the three coins is choosen at random and tossed.Of it shows head,what is probability that it was the two headed coin?



299. An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probability of an accidents are 0.01, 0.03 and 0.15 respectively. One of the insured persons meets with an accident. What is the probability that he is a scooter driver?



300. A factory has two machines A and B. Past record shows that machine A produced 60% of the items of output and machine B produced 40% of the items. Further, 2% of the items produced by machine A and 1% produced by machine B were defective. All the items are put into one stockpile and then one item is chosen at random from this and is found to be defective. What is the probability that it was produced by machine B?

Watch Video Solution

301. Two groups are competing for the position on the Board of directors of a corporation. The probabilities that the first and the second groups will win are 0.6 and 0.4 respectively. Further, if the first group wins, the probability of introducing a new product is 0.7 and the corresponding probability is 0.3 if the

second group wins. Find the probability that the new product

introduced was by the second group.



302. Suppose a girl throws a die. If she gets a 5 or 6, she tosses a coin three times and notes the numbers of heads. If she gets 1,2,3, or 4, she tosses a coin once and notes whether a head or a tail is obtained. If she attained exactly one head what is the probability that she threw 1,2,3, or 4 with the die?

Watch Video Solution

303. A manufacturer has three machine operators A, B and C. The first operator A produces 1% defective items, where as the other two operators B and C pro duce 5% and 7% defective items respectively. A is on the job for 50% of the time, B is on the job for 30% of the time and C is on the job for 20% of the time. A defective item is produced, what is the probability that it was produced by A?



304. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. Find the probability of the lost card being a diamond.



305. Probability that A speaks truth is $\frac{4}{5}$. A coin is tossed. A reports that a head appears. The probability that actually there

was head is

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

B. $\frac{1}{2}$
C. $\frac{1}{5}$
D. $\frac{2}{5}$

Answer:



306. If A and B are two events such that $A \subset B$ and $P(B) \neq 0$, then which of the following is correct?

A.
$$P(A \, / \, B) = rac{P(B)}{P(A)}$$

B. $P(A \, / \, B) < P(A)$

$$\mathsf{C}.\, P(A\,/\,B) \geq P(A)$$

D. none of these

Answer:



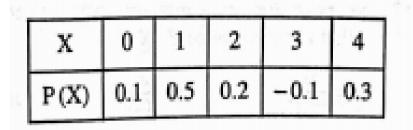
307. State which of the following are not the probability

distribution of a random variable. Give reasons for your answer.

x	0	1	2	
P(X)	0.4	0.4	0.2	

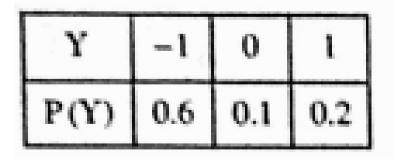
Watch Video Solution

308. State which of the following are not the probability distribution of a random variable. Give reasons for your answer.





309. State which of the following are not the probability distribution of a random variable. Give reasons for your answer.



310. State which of the following are not the probability distribution of a random variable. Give reasons for your answer.

Z	3	2	1	0	-1	
P(Z)	0.3	0.2	0.4	0.1	0.05	•

Watch Video Solution

311. An urn contains 5 red and 5 black balls. Two balls are randomly selected. Let X represent the number of black balls. What are the possible values of X. is X a random variable?



312. Let X represent the difference between the number of heads and the number of tails obtained when a coin is tossed 6 times. What are possible values of X?



313. Find the probability distribution of number of heads in two

tosses of a coin

Watch Video Solution

314. Find the probability distribution of number of tails in the

simultaneous tosses of three coins.



315. Find the probability distribution of

number of tails in four tosses of a coin.



316. Find the probability distribution of the number of successes in two tosses of a die, where a success is defined as : number greater than 4



317. Find the probability distribution of the number of successes

in two tosses of a die, where a success is defined as : six appears

on at least one die.



318. From a lot of 30 bulbs which include 6 defectives, a sample of 4 bulbs is drawn at random with replacement. Find the probability distribution of the number of defective bulbs.



319. A coin is biased so that the head is 3 times as likely to occur as tail. If the coin is tossed twice, find the probability distribution of number of tails.

Watch Video Solution

320. A random variable X has the following probability distribution

x	0	1	2	3	4	5	6	7
P(X)	0	k	2 k	2 <i>k</i>	3 <i>k</i>	k ²	2 k ²	$7k^2 + k$

Determine

k?

Watch Video Solution

321. A random variable X has the following probability

distribution

	х	0	1	2	3	4	5	6	7
L	P(X)	0	k	2 k	2 <i>k</i>	3 <i>k</i>	k ²	2 k ²	$7k^2 + k$

Determine

P(X<3)?



322. A random variable X has the following probability

distribution

x	0	1	2	3	4	5	6	7
P(X)	0	k	2 <i>k</i>	2 <i>k</i>	3 <i>k</i>	k ²	2 k ²	$7k^2 + k$

Determine

P(X>6)?

Watch Video Solution

323. A random variable X has the following probability

distribution

х	0	1	2	3	4	5	6	7
P(X)	0	k	2 k	2 <i>k</i>	3 <i>k</i>	k ²	$2k^2$	$7k^2 + k$

Determine

P(0 < X < 3)?

324. The random variable X has a probability distribution P(X) of the following form, where k is some number : $P(x) = \{(k, , \text{if}, x = 0), (2k, , \text{if}, x = 1), (3k, , \text{if}, x = 2), (0, , , ,) : \}$

Determine the value of k.

Watch Video Solution

325. The random variable X has a probability distribution P(X) of

the following form, where k is some number :

$$P(X) = egin{cases} \mathrm{k}, \mathrm{If}x = 0 \ 2k, \mathrm{if}x = 1 \ 3k, \mathrm{if}x = 2 \ 0, \mathrm{otherwise} \end{cases}$$

Find $P(X < 2), P(X \le 2), P(X \ge 2)$

Watch Video Solution

326. Find the mean number of heads in three tosses of a fair coin.

• Watch Video Solution 327. Two dice are thrown simultaneously. If X denotes the number of sixes, find the expectation of X. • Watch Video Solution

328. Two numbers are selected at random (without replacement) from the first six positive integers. Let X denote the larger of the two numbers obtained. Find E(X).

Watch Video Solution

329. Let X denote the sum of the numbers obtained when two fair dice are rolled. Find the variance and standard deviation of X.



330. A class has 15 students whose ages are 14, 17, 15, 14, 21, 17, 19, 20, 16, 18, 20, 17, 16, 19 and 20 years. One student is selected in such a manner that each has the same chance of being chosen and the age X of the selected student is recorded. What is the probability distribution of the random variable X? Find mean, variance and standard deviation of X.



331. In a meeting, 70% of the members favour and 30% oppose a certain proposal. A member is selected at random and we take X = 0 if he opposed, and X = 1 if he is in favour. Find E(X)and Var(X).

Watch Video Solution

332. The mean of the numbers obtained on throwing a die having written 1 on three faces, 2 on two faces and 5 on one face is:

A. 1

B. 2

C. 5

D. $\frac{8}{3}$

Answer:

D Watch Video Solution

333. Suppose that two cards are drawn at random from a deck of cards. Let X be the number of aces obtained. Then the value of E(X) is:

A.
$$\frac{37}{221}$$

B. $\frac{5}{13}$
C. $\frac{1}{13}$
D. $\frac{2}{13}$

Answer:

334. A die is thrown 6 times. If 'getting an odd number' is a success, what is the probability of 5 successes?



335. A die is thrown 6 times. If getting an odd numebr is a succes, what is the probability of

atleast 5 successes?

Watch Video Solution

336. A die is thrown 6 times. If getting an odd numebr is a succes, what is the probability of

atmost 5 successes?

337. A pair of dice is thrown 4 times. If getting a doublet is considered a success, find the probability of two successes.



338. There are 5% defective items in a large bulk of items. What

is the probability that a sample of 10 items will include not

more than one defective item?



339. Five cards are drawn successively with replacemnet form a

well shuffled deck of 52 cards. What is the probability that

all the five cards are diamonds?





340. Four cards are drawn successively with replacement from a

well shuffled deck of 52 cards. What is the probability that

only 3 cards are spades?

Watch Video Solution

341. Five cards are drawn successively with replacemnet form a well shuffled deck of 52 cards. What is the probability that

none is a spade?



342. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Find the probability that out of 5

such bulbs none will fuse after 150 days of use.

Watch Video Solution

343. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Find the probability that out of 5 such bulbs not more than one will fuse after 150 days of use.

> Watch Video Solution

344. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Find the probability that out of 5 such bulbs more than one will fuse after 150 days of use.

Watch Video Solution

345. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Find the probability that out of 5 such bulbs at least one bulb will fuse after 150 days of use.

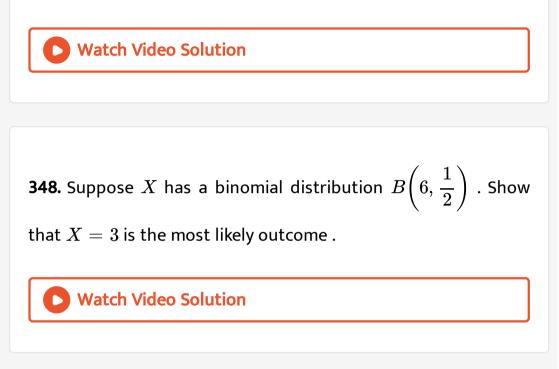


346. A bag consists of 10 balls each marked with one of the digits 0 to 9. If four balls are drawn successively with replacement from the bag, what is the probability that none is marked with the digit 0?



347. In an examination, 20 questions of true-false type are asked. Suppose a student tosses a fair coin to determine his

answer to each question. If the coin falls heads, he answers 'true', if it falls tails, he answers 'false'. Find the probability that he answers at least 12 questions correctly.



349. On a multiple choice examination with three possible answers for each of the five questions, what is the probability that a candidate would get four or more correct answers just by guessing ?

350. A person buys a lottery ticket in 50 lotteries, in each of which his chance of winning a prize is $\frac{1}{100}$. What is the probability that he will win a prize at least once.

Watch Video Solution

351. A person buys a lottery ticket in 50 lotteries, in each of which his chance of winning a prize is $\frac{1}{100}$. What is the probability that he will win a prize exactly once.

Watch Video Solution

352. A person buys a lottery ticket in 50 lotteries, in each of which his chance of winning a prize is $\frac{1}{100}$. What is the

probability that he will win a prize at least twice?

Watch Vide	eo Solution		

353. Find the probability of getting 5 exactly twice in 7 throws of

a die.

354. Find the probability of throwing at most 2 sixes in 6 throws

of a single die.



355. If is known that 10% of certain articles manufactured are defective. What is the probability that in a random sample of 12

Watch Video Solution

356. Binomial distribution is given this name because

- A. This distribution was envolved by James Binomial.
- B. Each trial has only two outcomes, namely success and failure.
- C. Its probability function is obtained by general term of binomial expansion.
- D. It is obtained by combining two distribution.

Answer:

357. Which of the following is not a case of Bernoulli's trials:

A. (a) tosses of a coin

B. (b) drawing balls (with replacement)from bag containing 5

white balls only

C. (c) throws of a pair of dice

D. (d) attmepting 10 true false type question on the basis of

the outcomes of tosses of a coin.

Answer:



358. A and B are two events such that $P(A) \neq 0$. Find

 $P(B \mid A)$,if : A is a subset of B



find the probability that both children are males if it is known

that at least one of the children is male.



361. A couple has two children, find the probability that both children are females, if it is known that the elder childis a



362. Suppose that 5% of men and 0.25% of women have grey hair. A grey haired person is selected at random. What is the probability of this person being male? Assume that there are equal number of males and females.



Watch Video Solution

363. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that all will bear 'X' mark.



364. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that not more than 2 will bear 'Y' mark.

> Watch Video Solution

365. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that at least one ball will bear 'Y' mark.

366. An urn contains 25 balls of which 10 balls bear a mark 'X' and the remaining 15 bear a mark 'Y'. A ball is drawn at random from the urn, its mark is noted down and it is replaced. If 6 balls are drawn in this way, find the probability that the number of balls with 'X' mark and 'Y' mark will be equal.

Watch Video Solution

367. In a hurdle race, a player has to cross 10 hurdles. The probability that he will clear each hurdle is $\frac{5}{6}$. What is the probability that he will knock down fewer than 2 hurdles?

368. A die is thrown again and again until three sixes are obtained. Find the probability of obtaining the third six in the sixth throw of the die.

O Watch Video Solution

369. If a leap year is selected at random, what is the chance that

it will contain 53 tuesdays?

Watch Video Solution

370. An experiment succeeds twice as often as it fails. Find the probability that in the next six trials, there will be at least 4 successes.

371. How many times must a man toss a fair coin so that the probability of getting at least one head is more than 90%?



372. In a game, a man wins a rupee for a six and loses a rupee for any other number when a fair die is thrown. The man decided to throw a die thrice but to quit as and when he gets a six. Find the expected value of the amount he wins / loses.



373. Suppose we have four boxes A,B,C and D containing coloured marbles as given below:

Box	Marble colour				
	Red	White	Black		
A	1	6	3		
в	6	2	2		
с	8	1	10		
D	0	6	4		

One of the boxes has been selected at random and a single marbles is drawn from it. If the marbles is red, what is the probability that it was drawn from box A? box B? box C?



374. Assume that the chances of a patient having a heart attack is 40%. It is also assumed that a meditation and yoga course reduce the risk of heart attack by 30% and prescription of certain drug reduces its chances by 25%. At a time a patient can choose any one of the two options with equal probabilities. It is given that after going through one of the two options the patient selected at random suffers a heart attack. Find the

probability that the patient followed a course of meditation and

yoga?



375. If each element of a second order determinant is either zero or one, what is the probability that the value of the determinant is positive? (Assume that the individual entries of the determinant are chosen independently, each value being assumed with probability $\frac{1}{2}$)

Watch Video Solution

376. An electronic assembly consists of two subsystems, say, A and B. From previous testing procedures, the following probabilities are assumed to be known : P(A fails) = 0.2, P(B fails alone) $= 0.15, P(A \text{ and } \mathsf{B} \text{ fail }) = 0.15$ Evaluate the

following probabilities: P(A fails | B has failed)

Watch Video Solution

377. An electronic assembly consists of two subsystems, say, A and B. From previous testing procedures, the following probabilities are assumed to be known : P(A fails) = 0.2, P(B fails alone) = 0.15, P(A and B fail) = 0.15 Evaluate the following probabilities: P(A fails alone)

Watch Video Solution

378. Bag I contains 3 red and 4 black balls and Bag II contains 4 red and 5 black balls. One ball is transferred from Bag I to Bag II and then a ball is drawn from Bag II. The ball so drawn is found

to be red in colour. Find the probability that the transferred ball

is black



- **379.** If A and B are two events such that $P(A) \neq 0$ and $P\left(\frac{B}{A}\right) = 1$, then
 - A. $A\subset B$
 - ${\tt B}.\,B\subset A$
 - $\mathsf{C}.\,B=\phi$
 - D. $A = \phi$

Answer:



380. If $P\left(rac{A}{B}
ight) > P(A)$, then which of the following is correct :

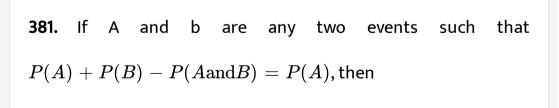
A.
$$P\left(\frac{B}{A}\right) < P(B)$$

B. $P(A \cap B) < P(A)P(B)$
C. $P\left(\frac{B}{A}\right) > P(B)$
D. $P\left(\frac{B}{A}\right) = P(B)$

Watch Video Solution

Answer:

:



A. P(B/A)=1

B. P(A/B)=1

C. P(B/A)=0

D. P(A/B)=0

Answer:



382. Fill ups

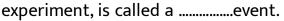
The set{} as a subset space S, associated with an experiment, is

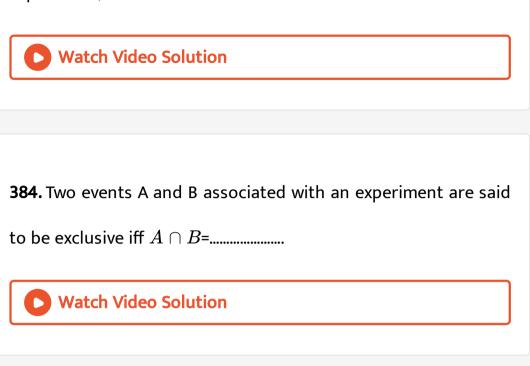
called an.....event.



383. Fill ups

The set S as a subset of itself, where S is the sample space of an





385. Fill ups

Two events E_1 and E_2 associated with an experiment are

independent iff $P(E_1 \cap E_2)$ =.....



386. If A and B are such that $P(A' \cup B') = \frac{2}{3}$ and P $(A \cup B) = \frac{5}{9}$, then P(A') + P(B') =

Watch Video Solution

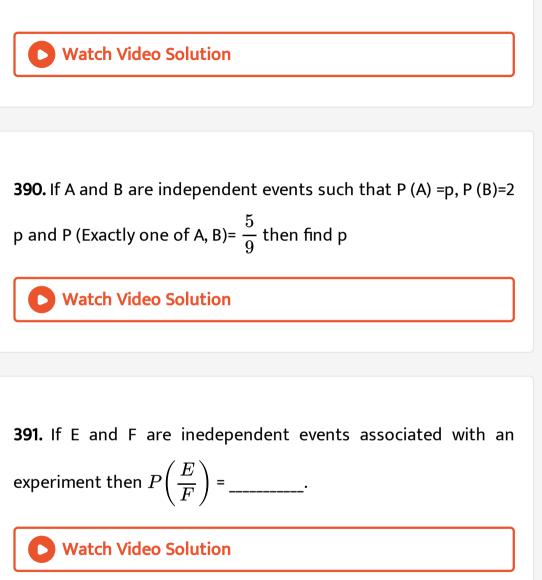
387. Fill ups

If A and B are two events such that P(A/B) = p, P(A)=p, $P(B) = rac{1}{3}$ and $P(A \cup B) = rac{5}{9}$ then p=......

Watch Video Solution

388. If E is an event associated with an experiment, find the value of $P(E) + P(E^c)$.

389. If A and B are independent events then P (A \cup B) =1



392. Fill ups

If the random variable X follows Binomial distribution with parameters n = 5, p and P(X = 2) = 9P(X = 3), then $p = \dots \dots$

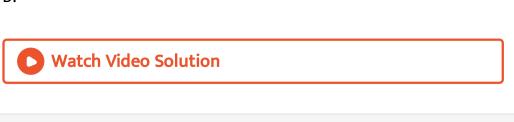
> Watch Video Solution

393. Fill ups

Watch Video Solution

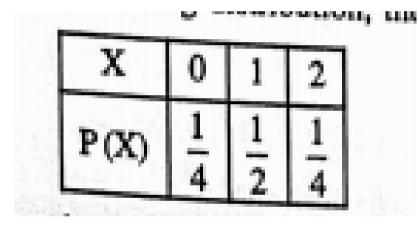
394. Fill ups

If A and B are two events such that P(A/B)=P(A), then A isof



395. Fill ups

For the following distribution, the mean is equal to.....





396. Fill ups

If a random variabale X follows Binomial distribution such that

P(X=20)=P(X=21) and number of trials is 40, then
p=
Vatch Video Solution
397. Let 'X' be a discrete random variable assuming values
x_1, x_2, x_n with probabilities $p_1, p_2,, p_n$

respectively. Then variance of 'X' is given by :



398. Fill ups

Mean of probability distribution of a random variable is also

known as.....value of the distribution.

399. Fill ups

If E is any event associated with an experiment, then P(either E

or E^c occurs)=........

Watch Video Solution

400. Fill ups

If A is any event associated with an experiment then P (both A

and B' occur)=............

Watch Video Solution

401. Fill ups

If A,B,c are three independent events such that P(A)=P(B)=P(



If E be an event associated with an experiment then P(E')=1-P(E).

Watch Video Solution

403. True or false

If A and B are independent events associated with an experiment, then $P(A \cap B) = P(A) + P(B)$.

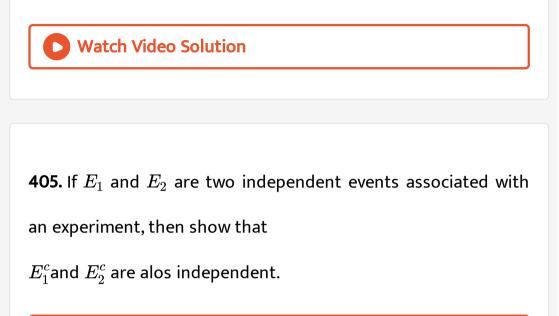
Watch Video Solution

404. True or false

If A and B are two events associated with an experiment such

```
that P(A)>0 and also P(B)>0, then A and B can be both mutaully
```

exclusive and independent.





406. If A,B,C are mutually exclusive and exhausive events associated with an experiment, then P(A)+P(B)+P(C)=1.

407. Two independent events are always mutually exclusive.



408. True or false

Two events E_1 and E_2 are said to be mutaully exclusive iff

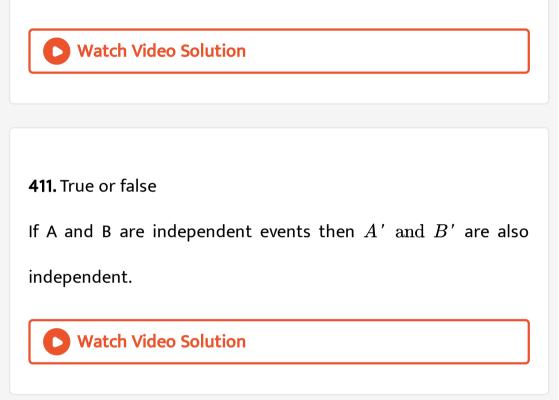
 $E_1 \cap E_2 = \phi$



409. True or false

Two mutually exclusive events are always independent.

If A and B are two independent events then P(A and B)=P(A)P(B).



412. For any two events E_1 and E_2 associated with an experiment $P(E_1 \cup E_2) = P(E_1) + P(E_2) + P(E_1 \cap E_2).$

For any two events E_1 and E_2 associated with an experiment.

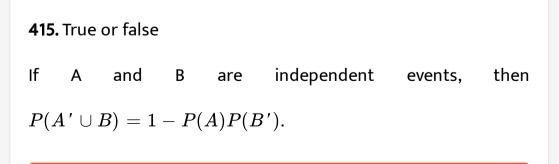
 $P(E_1 \cup E_2) = P(E_1 \cap E'_2\,) + P(E_1 \cap E_2) + P(E'_1 \, \cap E_2).$



414. True or false

Another name for the mean of a probability distribution is

expected value.





If E_1, E_2, E_3 events associated with an experiment, then $P(E_3) = P\left(rac{E_3}{E_1}
ight) P(E_1) P\left(rac{E_3}{E_2}
ight) P(E_2).$



417. True or false

If A and B are two events such that P(A)>0 and P(A)+P(B)>1, then

$$Pigg(rac{B}{A}igg) \geq 1 - rac{P(B^{\,\prime})}{P(A)}.$$

Watch Video Solution

418. True or false

Three events A,B,C are independent if

 $P(A \cap B \cap C) = P(A)P(B)P(C).$



419. True or false

If E_1, E_2, \ldots, E_n are mutually exclusive events associated with an experiment and E is any event associated with the same experiment, then $P(E) = \sum_{i=1}^n P\left(\frac{E}{E_i}\right) P(E_i).$



420. True or false

If A and B are independent then P(exacttly one of A and B occurs)=P(A)P(B')+P(A')P(B).



421. One of the condition of Bernoulli trials is that the trails are

independent of each other.



422. True or false

When a fair dice is rolled once, then the mean of the random variable X, which denotes the number appearing the upper most face of the dice is 7.

Watch Video Solution

423. Find the mean number of heads in three tosses of a fair coin.

If A, B and C are three independent events such that P(A)=P(B)=P(C)=p, then P(atleast two of A, B and C occur)= $3p^2-2p^2$



425. True or false

If a coin is tossed 5 times and X denote the number of heads

shows then P(X=2)=P(X=3).



426. True or false

Mean and variance of a binomial distribution are respectively np



Watch Video Solution

427. Match the statement in column I with those given in

column II.

COLUMN I	COLUMN II	
1. The probability of getting atleast 8 heads, when 10 coins are tossed, is	(p)	$\frac{1}{6}$
2. If A and B are two events such that P (A) = 0.4, P (B) = 0.2 and P (A \cup B) = 0.6, then P (A \cap B) =	(q)	$\frac{5}{4}$
3. Probability of throwing a total of 7 in a single throw of a pair of dice is	(<i>r</i>)	$\frac{3}{4}$
I. If A and B are two events such that P (A) = 0.6, P (B) = 0.2 and P (A/B) = 0.5, then P (A/B) is even to	(2)	$\frac{1}{3}$
then P (A'/B') is equal toVariance of the random variable X, which denotes the number of tails in three tosses of a coin, is equal to	(1)	$\frac{7}{128}$
5. Value of k if the probability distribution of a random variable X is	(u)	$\frac{3}{8}$
X 0.5 1 1.5 2		
$P(X) k k^2 2k^2 k$		
7. If A and B be two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$,	(v)	0
then $P(A/B) + P(B/A)$ is equal to		



428. Events A and B associated with an experiment are said to be independent iff

A.
$$P(A \cap B) = P(A) + P(B)$$

B.
$$P(A \cap B) = P(A)P(B)$$

 $\mathsf{C}.\, P(A\cap B)=\phi$

D. none of these

Answer:

Watch Video Solution

429. Events A and B are said to be mutually exclusive iff

A.
$$P(A \cap B) = P(A) + P(B)$$

B.
$$P(A \cap B) = P(A) + P(B)$$

 $\mathsf{C}.\, P(A\cap B)=\phi$

D. none of these

Answer:

Watch Video Solution

430. If A and B are independent events then which of the following is not true.

A. P(A/B)=P(A)

B. P(B/A)=P(B)

C. P(A/B)=P(B/A)

D. none of these

Answer:



431. Let A and B be two events. If
$$P(A) = 0.6, P(B) = 0.2, P\left(\frac{A}{B}\right) = 0.5$$
, then $P(A \cap B)$ is equal to :

A.
$$\frac{1}{10}$$

B. $\frac{3}{10}$
C. $\frac{3}{8}$
D. $\frac{6}{7}$

Answer:



432. If $P(A) = \frac{3}{10}$, $P(B) = \frac{2}{5}$ then $P(A \cup B) = \frac{3}{5}$, then P(B/A)+P(A/B) equals

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

B. $\frac{1}{3}$
C. $\frac{5}{12}$
D. $\frac{7}{12}$

Answer:



433. The event A and B are independent if

A.
$$P(A \cap B) = Piggl(rac{A}{B}iggr)P(B)$$

B. $P(A \cap B) = Piggl(rac{B}{A}iggr)P(A)$

 $\mathsf{C}.\, P(A\cap B)=P(A)+P(B)$

$$\mathsf{D}.\, P(A\cap B)=P(A)P(B)$$

Answer:

> Watch Video Solution

434. For a biased dice, the probabilities of the different faces to

turn up are

Face	1	2	3	4	5	6	Ş
Р	0.10	0.32	0.21	0.15	0.05	0.17	

the dice is tossed and it is told that either the face 1 or face 2

has shows up, then the probability that it is face 1 is

A.
$$\frac{16}{21}$$

B. $\frac{1}{10}$

C.
$$\frac{5}{16}$$

D. $\frac{5}{21}$



435. If
$$P(A) = \frac{2}{5}$$
, $P(B) = \frac{3}{10}$ and $P(A \cap B) = \frac{1}{5}$, then

P(A'/B')+P(B'/A') is equal to

A.
$$\frac{5}{6}$$

B. $\frac{5}{7}$
C. $\frac{65}{42}$

D. 1



436. If P(A) = 0.4, P(B)=0.8 and P(B/A)=0.6 then $P(A \cup B)$ =.

A. 0.24

B. 0.3

C. 0.48

D. 0.96

Answer:

Watch Video Solution

437. A and B are events such tahtP (A) = 0.4 , P (B) = 0.3 and P (A

 $\cup\,$ B) =0.5 . Then P (B $\,\cap\,A)$ equals

A.
$$\frac{2}{3}$$

B. $\frac{1}{2}$
C. $\frac{3}{10}$
D. $\frac{1}{5}$



438. If $P(A \cap B)$ =0.15, P(B)=0.10 then P(A/B)=

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

B. $\frac{1}{4}$

C. none

D.
$$\frac{1}{5}$$



439. In Q.10 P(A) = 0.4, P(B) = 0.3 P(A∩B)=0.2, P(B/A') is equal to

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

B. $\frac{3}{10}$
C. $\frac{5}{6}$
D. $\frac{1}{6}$

Answer:

Watch Video Solution

440. If $P(B) = \frac{3}{5}$, $P(A/B)=\frac{1}{2}$ and $P(A\cup B) = \frac{4}{5}$ then $P(A\cup B') + P(A'\cup B)=$

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

B. $\frac{4}{5}$
C. $\frac{1}{2}$

D. 1

Answer:



441. Let
$$P(A) = rac{5}{13}$$
, $P(B) = rac{9}{13}$ and $P(A \cap B) = rac{5}{13}$, then

P(A/B) is equal to

A.
$$\frac{6}{13}$$

B.
$$\frac{4}{13}$$

C. $\frac{5}{9}$
D. $\frac{5}{9}$



442. If A and B are two independent events with $P(A) = \frac{3}{5}$ and $P(B) = \frac{4}{9}$, then $P(A' \cap B')$ equals

A.
$$\frac{4}{15}$$

B. $\frac{8}{45}$
C. $\frac{2}{9}$
D. $\frac{1}{3}$

Watch Video Solution

443. If two events are independent then

A. they must be mutually exclusive

B. the sum of their probabilities must be equal to .

C. both(a) and (b) are correct

D. none of the above is correct.



444. If A and B are independent events such that 0 < P(A) < 1 and 0 < P(B) < 1 then which of the following is not correct ?

A. A and B mutually exclusive.

B. A and B' are independent

C. A' and B are independent

D. A' and B' are independent.

Answer:

Watch Video Solution

445. Let A and B be two events such that $P(A) = \frac{3}{8}$, $P(B) = \frac{5}{8}$ and $P(A \cup B) = \frac{3}{4}$ P(A/B) P(A'/B) is equal to

A.
$$\frac{2}{5}$$

B. $\frac{3}{8}$
C. $\frac{3}{20}$
D. $\frac{6}{25}$



446. Two events E and F are independent . If P (E) =0.3 , P (E $\cup F$) = 0.5 then P (E | F) - P (F |E) equals

A.
$$\frac{2}{7}$$

B. $\frac{3}{35}$
C. $\frac{1}{70}$



447. A bag contains 5 red and 3 blue balls. If 3 balls are drawn at random without replacement, the probability of getting exactly one red balls

A. A)
$$\frac{45}{196}$$

B. B) $\frac{135}{392}$
C. C) $\frac{15}{56}$
D. D) $\frac{15}{29}$



448. In reference Q.20 above, the probability that exactly two of

the three balls are red, the first balls being red is

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

B. $\frac{4}{7}$
C. $\frac{15}{28}$
D. $\frac{5}{28}$

Answer:



449. Three persons A,B and C fire at a target in turn, starting

with A. their probabilities of hitting the target are 0.4, 0.3 and

0.2 respectively. The probability of two hits is

A. 0.024

B. 0.188

C. 0.336

D. 0.452

Answer:

Watch Video Solution

450. Three distinguisable balls are distributed in three cells. The probability that all three occupy the same cell, given that atleast two of them are in the same cell, is

A.
$$\frac{1}{7}$$

B. $\frac{1}{9}$

 $\mathsf{C}.\,\frac{1}{6}$

D. none of these

Answer:

Watch Video Solution

451. Suppose X is a binomial variate B(5,p) and P(X=2)=P(X=3),

then p is equal to

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

B. $\frac{1}{4}$
C. $\frac{1}{3}$
D. $\frac{1}{2}$



452. A die is thrown and a card is selected at random from a deck of 52 playing cards. The probability of getting an even number on the die and a spade card is

A.
$$\frac{1}{8}$$

B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. $\frac{3}{4}$



453. A box contains 3 orange balls, 3 green and 2 blue balls. Three balls are drawn at random from the box wihout replacement. The probability of drawing 2 green balls and one blue ball is

A.
$$\frac{2}{21}$$

B. $\frac{3}{28}$
C. $\frac{1}{28}$
D. $\frac{167}{168}$

Answer:



454. A flashlight has 8 batteries out of which 3 are dead. If two

batteries are selected without replacement and tested, the

probability that both are dead is

A.
$$\frac{33}{56}$$

B. $\frac{9}{24}$
C. $\frac{1}{14}$
D. $\frac{3}{28}$

Answer:

Watch Video Solution

455. Two dice are thrown. If it is known that the sum of the number on the dice is less than 6, the probability of a getting a sum is 3

A.
$$\frac{1}{18}$$

B. $\frac{2}{5}$

C.
$$\frac{1}{5}$$

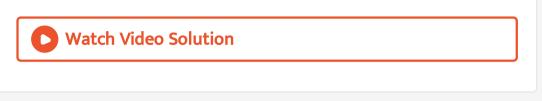
D. $\frac{5}{18}$

Watch Video Solution

456. Two cards are drawn from a well shuffled deck of 52 playing cards with replacement. The probability that both cards are queen, is :

A.
$$\frac{1}{13} \times \frac{1}{13}$$

B. $\frac{1}{13} + \frac{1}{13}$
C. $\frac{1}{13} \times \frac{1}{17}$
D. $\frac{1}{13} \times \frac{4}{51}$



457. The mean and variance of a random variable X having a binomial distribution are 4 and 2 respectively, then P(X=1) is

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

B. $\frac{1}{32}$
C. $\frac{1}{16}$
D. $\frac{1}{8}$

Answer:

Watch Video Solution

458. Two numbers are selected randomly from the set $S = \{1, 2, 3, 4, 5, 6\}$ without replacement one by one. The probability that minimum of the two numbers is less than 4 is a. 1/15 b. 14/15 c. 1/5 d. 4/5

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

B. $\frac{1}{15}$
C. $\frac{1}{5}$
D. $\frac{14}{15}$

Answer:



459. Which one is not a requirement of a binomial distribution?

A. There are 2 outcomes for each trials

B. There is a fixed number of trails.

C. The outcomes must be dependent on each other.

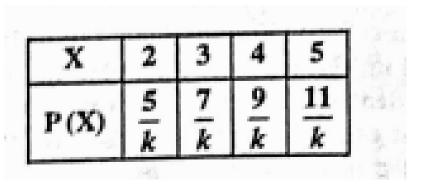
D. The probability of success must be same for each trial.

Answer:

Watch Video Solution

460. The probability distribution of a discrete random variable X

is given below:



The value of k is

A. 8

B. 32

C. 16

D. 48

Answer:

Watch Video Solution

461. Let X be a random variable. The probability distribution of X

is given below:

X	30	10	-10	
P(X)	1 5	$\frac{3}{10}$	$\frac{1}{2}$	

The E(X) is equal to

A. 6

B. 4

C. 3

D. -5

Answer:

Watch Video Solution

462. Let 'X' be a discrete random variable assuming values x_1, x_2, \dots, x_n with probabilities p_1, p_2, \dots, p_n respectively. Then variance of 'X' is given by :

A. $E(X^2)$

 $\mathsf{B}.\, E\bigl(X^2\bigr) + E(X)$

 $\mathsf{C}.\, E\bigl(X^2\bigr) - \left[E(X)\right]^2$

D.
$$\sqrt{E(X^2) - \left\{E(X)^2\right\}}$$



463. For the following probability distribution

X	-4	-3	-2	-1	0
P (X)	0.1	0.2	0.3	0.2	0.2

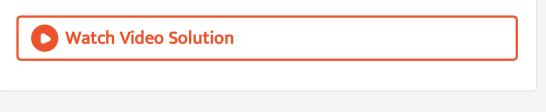
E(X) is equal to

A. 0

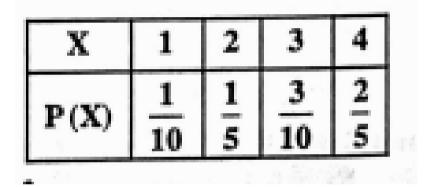
B. -1

C. -2

D. -1.8



464. For the following probability distribution



 $E\left(X^2
ight)$ is equal to

A. 3

B. 5

C. 7

D. 10



465. Suppose that a random variabe X follows Binomial distribution with parameters n and p,

where 0<p<1. If $\displaystyle \frac{P(X=r)}{P(X=n-r)}$ is independent of n and r, then

p is equal to

A.
$$\frac{1}{2}$$

B. $\frac{1}{3}$
C. $\frac{1}{5}$
D. $\frac{1}{7}$

466. In a college 30% students fall in physics 25% fall in mathematics and 10% fall in both one student is chosen at random, the probability that the student falls in Physics if he she has fallled in mathematics is

A.
$$\frac{1}{10}$$

B. $\frac{2}{5}$
C. $\frac{9}{20}$
D. $\frac{1}{3}$

Answer:

Watch Video Solution

467. A and B are two students. Their chances of solving a problem correctly are $\frac{1}{3}$ and $\frac{1}{4}$ respectively if the probability of their making a common error is $\frac{1}{20}$ and they obtain the same answer then the probability of their answer to be correct is

A.
$$\frac{1}{12}$$

B. $\frac{1}{40}$
C. $\frac{13}{40}$
D. $\frac{10}{13}$

