

# MATHS

## BOOKS - A N EXCEL PUBLICATION

### PROBABILITY

#### Question Bank

1. If one unbiased coin is tossed at random, write the sample space



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2. If two unbiased coin are tossed together, what will be the sample space ? Justify.



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3. A coin is tossed until two heads ora tail is realised specify the 'sample sapce'.



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4. A coin is tossed repeatedly until a head comes up. Write the sample space.



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5. Describe the sample space for the following indicated experiments A coin is tossed three times.



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6. Describe the sample space for the following indicated experiments A die is thrown tow times.



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7. Describe the sample space for the following indicated experiments A coin is tossed four times



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**8.** Describe the sample space for the following event:

A coin is tossed and a die is thrown.



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**9.** Describe the sample space for the following indicated experiments A coin is tossed and then a die is rolled only in case a head is shown on the coin.



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**10.** Describe the sample space for the following event:

2 boys and 2 girls are in a Room X and 1 boy and 3 girls in room Y. Specify the sample space for the experiment in which a room is selected and then a person.



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**11.** Describe the sample space for the following event:

One die of red colour, one of white colour and one of blue colour are placed in a bag. One die is selected at random and rolled, its colour and the number on its upper most face is noted.



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**12.** An experiment consists of recording boy - girl composition of families with two children What is the sample space if we are interested in knowing whether it is boy or a girl in the order of their births?

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**13.** An experiment consists of recording boy - girl composition of families with two children what is the sample space if we are interested in the number of girls in thye family?

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**14.** A box contains 1 red and 3 inddential white balls. Two balls are drawn at random in succession without replacement. Write the sample space for this experiment.



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**15.** An experiment consists of tossing a coin and then throwing it second time if a head occurs. If a tail occurs on the first toss, then a die is rolled once. Find the sample space.



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**16.** Suppose three bulbs are selected at random from a lot. Each bulb is tested and classified as defective ( $D$ ) or non-defective ( $N$ ). Write the sample space for this experiment.



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**17.** Describe the sample space for the following event:

A coin is tossed. If the outcome is a head, a die is thrown. If the die shows up an even number, the die is thrown again.



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**18.** The numbers 1, 2, 3, 4 are written separately on four slips of paper. The slips are put in a box and mixed thoroughly. A person draws two slips from the box one after the other, without replacement. Describe the sample space for the experiment.



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**19.** An experiment consists of rolling a die and then tossing a coin once if the number on the die is even. If the number on the die is odd, the coin is tossed twice. Write the sample space for the experiment.



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**20.** A coin is tossed. If it shows a tail, we draw a ball from a box which contains 2 red and 3 black balls. If it shows head, we throw a die. Find the sample space for the experiment.

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**21.** A die is thrown repeatedly until a six comes up. What is the sample space for this experiment?

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**22.** A die is rolled. Let  $E$  be the event "die shows 4" and  $F$  be the event "die shows even number". Are  $E$  and  $F$

mutually exclusive?



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**23.** A die is thrown. describe the following events:

A: a number less than 7.



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**24.** A die is thrown. Describe the following events (i) A : a number is less than 7(ii) B : a number is greater than 7(iii) C : a multiple of 3(iv) D : a number less than 4(v) E : an even number greater than 4(vi) F : a number not less

than

3

Also

find

$A \cup B, A \cap B, E \cup F, D \cap E, A - C, D - E, F', E \cap F'$



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25. A die is thrown. Describe the following events (i) A : a number is less than 7(ii) B : a number is greater than 7(iii) C : a multiple of 3(iv) D : a number less than 4(v) E : an even number greater than 4(vi) F : a number not less

than

3

Also

find

$A \cup B, A \cap B, E \cup F, D \cap E, A - C, D - E, F', E \cap F'$



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26. A die is thrown. Describe the following events (i) A : a number is less than 7(ii) B : a number is greater than 7(iii) C : a multiple of 3(iv) D : a number less than 4(v) E : an even number greater than 4(vi) F : a number not less than 3

Also find

$A \cup B, A \cap B, E \cup F, D \cap E, A - C, D - E, F', E \cap F'$

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27. A die is thrown. describe the following events:

E: An even number greater than 4.

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**28.** A die is thrown. Describe the following events (i) A : a number is less than 7(ii) B : a number is greater than 7(iii) C : a multiple of 3(iv) D : a number less than 4(v) E : an even number greater than 4(vi) F : a number not less than 3

Also find  $A \cup B, A \cap B, E \cup F, D \cap E, A - C, D - E, F', E \cap F'$



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**29.** An experiment involves rolling a pair of dice and recording the numbers that come up. Describe the following events.

A : the sum is greater than 8, B : 2 occurs on either die, C : the sum is at least 7 and a multiple of 3. Which pairs of these events are mutually exclusive?



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**30.** Three coins are tossed once . Let A denote the event "three heads show" , B denote the event "two heads and one tail show", C denote the event " three tails show" and D denote the event "a head shows on the first coin". Which events are mutually exclusive?



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**31.** Three coins are tossed once . Let A denote the event "three heads show" , B denote the event "two heads and one tail show", C denote the event " three tails show"

and D denote the event "a head shows at the first coin".

Which events are simple?



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**32.** Three coins are tossed once . Let A denote the event "three heads show" , B denote the event "two heads and one tail show", C denote the event " three tails show" and D denote the event "a head shows at the first coin".

Which events are Compound?



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**33.** Three coins are tossed. Describe two events which are mutually exclusive.



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**34.** Three coins are tossed. Describe three events which are mutually exclusive and exhaustive.



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**35.** Three coins are tossed. Describe Two events which are not mutually exclusive.



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**36.** Three coins are tossed. Describe Two events which are mutually exclusive but not exhaustive.



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**37.** Three coins are tossed. Describe Two events which are mutually exclusive but not exhaustive.



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**38.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events A'



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**39.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events not B.



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**40.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$ .

Describe the events A or B.



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**41.** Two dice are thrown. The events A,B and C are as follows:

A: getting an even number on the first die.

B: getting an odd number on the first die.

C: getting sum of the numbers on the dice  $\leq 5$ .

Describe the events.



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**42.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events A but not C.



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**43.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events B or C.



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**44.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events B and C.

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**45.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

Describe the events  $A \cap B' \cap C'$

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B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

state true or false ( give reason for yours answer)

A and B are mutually exclusive and exhaustive.



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**48.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

state true or false ( give reason for yours answer).

$A = B'$ .



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**49.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

state true or false ( give reason for yours answer).

A and C are mutually exclusive.



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**50.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

state true or false ( give reason for yours answer) A and B'

are mutually exclusive



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**51.** Two dice are thrown. The events A , B and C are as follows.

A : getting an even number on the first die

B : getting an odd number on the first die.

C : getting the sum of the number on the dice  $\leq 5$

state true or false ( give reason for yours answer).

A', B' , C are mutually exclusive and exhaustive.



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52. A fair die is thrown Write down the sample space



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53. A die is thrown at random Let A and B be the events that the "die shows an even number " the die shows a prime number" respectively. Write down A and B sets



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**54.** Consider the sample space  $S = \{1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Are A and B mutually exclusive? Are A and B exhaustive ? Justify your answer.



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**55.** Suppose a bag contains 5 white balls. Let the white balls be denoted by  $w_1, w_2, w_3, w_4$  and  $w_5$  If one ball is chosen at random, write down the sample space.



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56. Suppose a bag contains 5 white balls. Let the white balls be denoted by  $w_1, w_2, w_3, w_4$  and  $w_5$ . If two balls are chosen at random without replacement, write down the sample space.



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57. Suppose a bag contains 5 white balls. Let the white balls be denoted by  $w_1, w_2, w_3, w_4$  and  $w_5$ . If two balls are chosen at random with replacement, write the sample space.



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**58.** Given that a sample space is discrete if it contain either a finite number of points or a countably infinite number of points and a sample space is continuous if it contains uncountable number of points If coin is tossed till a tail appears, find the sample space.



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**59.** Suppose that two letters of the words "MATHS" are arranged at random Write down the sample space.



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**60.** Suppose that two letters of the words "MATHS" are arranged at random. Let  $A$  be the event that in the arrangement  $A$  occupies first position and  $B$  be the event that in the arrangement  $M$  occupies the second position. Write  $A$  and  $B$  as sets.



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**61.** Suppose that two letters of the words "MATHS" are arranged at random. Let  $A$  be the event that in the arrangement  $A$  occupies first position and  $B$  be the event that in the arrangement  $M$  occupies the second position. Write  $A$  and  $B$  as sets.



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**62.** Suppose that a group of students consists of 3 boys namely  $G_1$ ,  $G_2$  and  $G_3$ . If two students are selected at random from the group, write the sample space.

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**63.** Suppose that a group of students consists of 3 boys namely  $B_1$ ,  $B_2$  and  $B_3$  and 3 girls namely  $G_1$ ,  $G_2$  and  $G_3$ . If two students of the group are arranged at random, write the sample space.

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**64.** Consider the sample space  $S = \{1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Are A and B mutually exclusive? Are A and B exhaustive? Justify your answer.

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**65.** Consider the sample space  $S = \{1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Write down the following event as sets -The events that A occurs but B does not occur

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**66.** Consider the sample space  $S = \{ 1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Write down the following event as sets- The event that either A or B occurs.



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**67.** Consider the sample space  $S = \{ 1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Write down the following event as sets -The event that both A and B occur together.



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**68.** Consider the sample space  $S = \{ 1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Write down the following events as sets The event that neither A nor B occurs



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**69.** Consider the sample space  $S = \{ 1,2,3,4,5,6,7\}$  of a random experiment. Let A and B be two events given by  $A = \{1,2,3,4\}$  and  $B = \{3,4,5,6,7\}$  Write down the following event as sets- The event that A occurs or B does not occur.



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70. Consider the random experiment of tossing two coins together Write down the sample space



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71. Consider the random experiment of tossing two together which of the following events is a sure event and which is an impossible event? The event that the first coin shows head



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**72.** Consider the random experiment of tossing two together which of the following events is a sure event and which is an impossible event? The event that at least one coin shows head.



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**73.** Consider the random experiment of tossing two together which of the following events is a sure event and which is an impossible event? The event that the first coin shows head



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**74.** Consider the random experiment of tossing two coins together which of the following events is a sure event and which is an impossible event? The event that the each coin shows either a head or a tail.



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**75.** Consider the random experiment of tossing two together which of the following events is a sure event and which is an impossible event? The event that both coins can't show head together.



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76. Suppose a coin is tossed at random. Find probability for getting head.



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77. Suppose a coin is tossed at random. Find probability for getting tail.



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78. A fair die is thrown Write down the sample space



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**79.** A fair die is thrown Let A be the event that the number thrown is less than 4. Write A as a set. Hence , find  $P(A)$



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**80.** A fair die is thrown, find the probability that the number thrown is not less than 4.



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**81.** Suppose that two coins are tossed simultaneously  
Write down the sample space



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**82.** Suppose that two coins are tossed simultaneously

Let A be the event that the first coin shows head and B

be the event that both coin show tail. Write A and B as

sets. Hence, find  $P(A)$  and  $P(B)$



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**83.** Suppose that two coins are tossed simultaneously

Let A be the event that the first coin shows head and B

be the event that both coin show tail. Write A and B as

sets. Hence, find  $P(A)$  and  $P(B)$



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**84.** Consider the random experiment of throwing two dice together Write the sample space of the experiment



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**85.** Consider the random experiment of throwing two dice together What is the probability of "getting a sum 12"?



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**86.** Consider the random experiment of throwing two dice together Write any two events which are mutually

exclusive and exhaustive from the above experiment



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**87.** Three unbiased coins are tossed simultaneously

Write down the sample space.



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**88.** Three unbiased coins are tossed simultaneously Find

the probability of getting one tail.



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**89.** Three unbiased coins are tossed simultaneously Find the probability of getting more heads than tails.

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**90.** Three unbiased coins are tossed simultaneously Find the probability of getting at most one head

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**91.** There are 100 students in a college class of which 36 are boys studying statistics and 13 girls not studying statistics. There are 55 girls in all. Suppose a student is

picked up at random from the class. Then match the following

Column : A	Column : B
$P$ (the student picked up is a boy)	$\frac{42}{100}$
$P$ (the student picked up is a boy studying statistics)	$\frac{45}{100}$
$P$ (the student picked up is a girl studying statistics)	$\frac{22}{100}$

$P$ (the student picked up is not studying statistics)	$\frac{36}{100}$
	$\frac{55}{100}$
	$\frac{13}{100}$

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92. The letters of the word "SOCIETY" are placed at random in a row. Find the number of ways in which all the letters of given word can be permuted in a row.





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**93.** The letters of the word "SOCIETY" are placed at random in a row Find the number of arrangements of the letters of the given word in a row so that the three vowels come together.



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**94.** The letters of the word "SOCIETY" are placed at random in a row What is the probability that in the random arrangement of the letters of the given word the three vowels come together?



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**95.** Thirteen persons take their places at a round table.

In how many ways the 13 persons can be arranged ?



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**96.** Thirteen persons take their places at a round table.

In how many arrangements two particular person sitting together?



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**97.** Thirteen persons take their places at a round table.

Show that it is five to one against two particular prssons



sitting together.



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**98.** Suppose  $A$  and  $B$  are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and  $P(A \cap B) = 0.2$

Find  $P(A \cup B)$



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**99.** Suppose  $A$  and  $B$  are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and

$$P(A \cap B) = 0.2$$

$$P(\bar{A}) \text{ and } P(\bar{B})$$



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**100.** Suppose A and B are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and

$$P(A \cap B) = 0.2$$

$$P(A \cap \bar{B})$$



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**101.** Suppose A and B are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and

$$P(A \cap B) = 0.2$$

P (exactly one of A and B occurs)



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**102.** Suppose A and B are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and

$$P(A \cap B) = 0.2$$

P(none of A and B occurs)



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**103.** Suppose A and B are two events associated with a random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and

$$P(A \cap B) = 0.2$$

$$P(\bar{A} \cup B)$$



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**104.** The probability that a student passes in a physics test is  $\frac{2}{3}$  and the probability that he passes both the physics and English test is  $\frac{14}{45}$ . If the probability that he passes at least one test is  $\frac{4}{5}$ , find the probability that the student doesn't pass the physics test



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**105.** The probability that a student passes in a physics test is  $\frac{2}{3}$  and the probability that he passes both the physics and English test is  $\frac{14}{45}$ . If the probability that he passes at least one test is  $\frac{4}{5}$ , find the probability that the student passes English test.



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**106.** The probability that a student passes in a physics test is  $\frac{2}{3}$  and the probability that he passes both the physics and English test is  $\frac{14}{45}$ . If the probability that he passes at least one test is  $\frac{4}{5}$ , find the probability that the student passes exactly one of the two tests



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**107.** The probability that a student passes in a physics test is  $\frac{2}{3}$  and the probability that he passes both the physics and English test is  $\frac{14}{45}$ . If the probability that he passes at least one test is  $\frac{4}{5}$ , find the probability that the student passes neither the Physics test nor the English test.



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**108.** Which of the following can not be valid assignment of probabilities for outcomes of sample space

$$S = \{w_1, w_2, w_3, w_4, w_5, w_6, w_7\}$$

Assignment	$w_1$	$w_2$	$w_3$	$w_4$	$w_5$	$w_6$	$w_7$
(a)	0.1	0.01	0.05	0.03	0.01	0.2	0.6
(b)	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$
(c)	0.1	0.2	0.3	0.4	0.5	0.6	0.7
(d)	-0.1	0.2	0.3	0.4	-0.2	0.1	0.3
(e)	$\frac{1}{14}$	$\frac{2}{14}$	$\frac{3}{14}$	$\frac{4}{14}$	$\frac{5}{14}$	$\frac{6}{14}$	$\frac{15}{14}$



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**109.** A coin is tossed twice. What is the probability that at least one tail occurs?



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**110.** A die is rolled, find the probability of following event:  
A prime number will appear.



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**111.** A die is rolled, find the probability of following event:

A number greater than or equal to 3 will appear.



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**112.** A die is rolled, find the probability of following event:

A number less than or equal to one will appear.



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**113.** A die is rolled, find the probability of following event:

A number more than 6 will appear.



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**114.** A die is rolled, find the probability of following event:

A number less than 6 will appear.



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**115.** A card is selected from a pack of 52 cards

How many points are there in the sample space?



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**116.** A card is selected from a pack of 52 cards , Calculate the probability that the card is an ace of spades.

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**117.** A card is selected from a pack of 52 cards  
Calculate the probability that the card is an ace

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**118.** A card is selected from a pack of 52 cards  
Calculate the probability that the card is black card



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**119.** A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed, find the probability that the sum of the numbers that turn up is 12



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**120.** A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed, find the probability that the sum of the numbers that turn up is 12



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**121.** A fair coin is tossed four times and a person win Rs. 1 for each head and lose Rs. 1.50 for each tail that turns up.

From the sample space calculate how many different amounts of money you can have after four tosses and the probability of having each of these amounts.



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**122.** Three coins are tossed once. Find the probability of getting  
3 heads



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**123.** Three coins are tossed once. Find the probability of getting

2 heads



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**124.** Three coins are tossed once. Find the probability of getting atleast two heads.



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**125.** Three coins are tossed once. Find the probability of getting

atmost 2 heads



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**126.** Three coins are tossed once. Find the probability of getting no head.



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**127.** Three coins are tossed once. Find the probability of getting  
3 tails



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**128.** Three coins are tossed once. Find the probability of getting exactly two tails



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**129.** Three coins are tossed once. Find the probability of getting no tails



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**130.** Three coins are tossed once. Find the probability of getting  
at most two tails



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**131.** If  $\frac{2}{11}$  is the probability of an event A, then what is the probability of the event 'not A'?



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**132.** A letter of the word *ASSASSINATION* are randomly chosen. Find the probability that letter is a



vowel.



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**133.** A letter of the word *ASSASSINATION* are randomly chosen. Find the probability that letter is a consonant.



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**134.** In a lottery, a person chosen six different natural numbers from 1 to 20 and if these six number match with six numbers already fixed by the lottery committee, he wins the prize. What is the probability of winning the

prize in the game (order of the numbers is not important)

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**135.** Check whether the following probabilities  $P(A)$  and  $P(B)$  are consistently defined.

$$P(A) = 0.5, P(B) = 0.7, P(A \cap B) = 0.6$$

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**136.** Check whether the following probabilities  $P(A)$  and  $P(B)$  are consistently defined.

$$P(A) = 0.5, P(B) = 0.4, P(A \cup B) = 0.8$$



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137. Fill in the blanks in the following table

	$P(A)$	$P(B)$	$P(A \cap B)$	$P(A \cup B)$
(i)	$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{15}$	---
(ii)	0.35	---	0.25	0.6
(iii)	0.5	0.35	---	0.7

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138. Given  $P(A) = \frac{3}{5}$  and  $P(B) = \frac{1}{5}$

Find  $P(A \text{ or } B)$ , if  $A$  and  $B$  are mutually exclusive events.

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139. If  $E$  and  $F$  are events such that  $P(E) = \frac{1}{4}$ ,  $P(F) = \frac{1}{2}$ , and  $p(E \text{ and } F) = \frac{1}{8}$ . find  $P(E \text{ or } F)$ .



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140. If  $E$  and  $F$  are events such that  $P(E)=1/4$ ,  $P(F)=1/2$  and  $P(E \text{ and } F)=1/8$ , find  $P(\text{not } E \text{ and not } F)$



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**141.** Events E and F are such that  $P(\text{not } E \text{ or not } F)=0.25$ .

State whether E and F are mutually exclusive.



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**142.** A and B are events such that  $P(A)=0.42$ ,  $P(B)=0.48$

and  $P(A \text{ and } B)=0.16$ . Determine  $P(\text{not } A)$



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**143.** A and B are events such that  $P(A)=0.42$ ,  $P(B)=0.48$

and  $P(A \text{ and } B)=0.16$ . Determine  $P(\text{not } B)$



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**144.** A and B are events such that  $P(A)=0.42$ ,  $P(B)=0.48$  and  $P(A \text{ and } B)=0.16$ . Determine  $P(A \text{ or } B)$



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**145.** In class XI of a school 40% of the students study Mathematics and 30% study Biology, 10% of the class study both Mathematics and Biology. If a student is selected at random from the class, find the probability that he will be studying mathematics or Biology.



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**146.** In an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing at least one of them is 0.95. What is the probability of passing both?



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**147.** The probability that Ramu pass the examination in both mathematics and Physics is 0.5, the probability of passing neither Mathematics nor Physics is 0.1, the probability of passing Mathematics is 0.75 What is probability of passing Physics?



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**148.** In a class of 60 students, 30 selected for NCC, 32 selected for NSS and 24 selected for both NCC and NSS. If one of these students is selected at random, find the probability that: the students has selected neither NCC nor NSS.



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**149.** In a class of 60 students, 30 selected for NCC, 32 selected for NSS and 24 selected for both NCC and NSS . If one of these students is selected at random, find the probability that: the students selected for NCC or NSS.





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**150.** Suppose  $A$ ,  $B$  and  $C$  are three mutually exclusive and exhaustive events. What is  $A \cup B \cup C$ ?



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**151.** Suppose  $A$ ,  $B$  and  $C$  are three mutually exclusive and exhaustive events

Prove that  $P(A)+P(B)+P(C)=1$



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**152.** Suppose A, B and C are three mutually exclusive and exhaustive events. If in addition  $\frac{1}{3} P(C) = \frac{1}{2} P(A) = P(B)$ , find  $P(A)$ ,  $P(C)$



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**153.** A bag contains 5 red balls, 3 black balls and 4 white balls. A ball is drawn out of the bag at random  
What is the probability that the ball drawn is white?  
Hence find the probability that the ball drawn is either red or white



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**154.** A bag contains 5 red balls, 3 black balls and 4 white balls. A ball is drawn out of the bag at random

What is the probability that the ball drawn is white?

Hence find the probability that the ball drawn is either red or white. find the probability that the ball drawn is either red or black.



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**155.** Two dice are rolled once. Let A be the event that the first die shows an odd number and B be the event that the sum of the numbers on the dice is 8.

Complete the following table

Column : A	Column : B
$P(A)$	-----
$P(B)$	-----
$P(A \cap B)$	-----



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**156.** Two dice are rolled once. Let A be the event that the first die shows an odd number and B be the event that the sum of the numbers on the dice is 8.

Find the probability that either the first die shows an odd number or the sum of numbers on the dice is 8.



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157. Two dice are thrown at random. Match the following

Column : A	Column : B
$P$ (sum of the face numbers thrown is 5)	$2/9$
$P$ (the number on one die is double the number on the other)	$5/36$
$P$ (one die gives the number 5 and the other a number less than 5)	$1/9$
$P$ (both dice show the same number other than 6)	$1/6$ $7/36$

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158. Suppose that four coins are tossed together write the event of getting at least three heads as a set.

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**159.** Suppose that four coins are tossed together. Find the probability of getting at least three heads.



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**160.** The letters of the word "SOCIETY" are placed at random in a row. Find the number of ways in which all the letters of given word can be permuted in a row.



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**161.** Suppose that the letters of the word "INSTITUTION" are arranged together at random. Find the number of

arrangements of the letters so that the three T's are together.



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**162.** The letters of the word "SOCIETY" are placed at random in a row. What is the probability that in the random arrangement of the letters of the given word the three vowels come together?



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**163.** A bag contains 5 white and 3 black balls. Two balls are drawn at random one after the other without

replacement. Find in how many ways the two balls can be drawn.



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**164.** A bag contains 5 white and 3 black balls. Two balls are drawn at random one after the other without replacement. Find in how many ways the two balls can be drawn.



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**165.** A bag contains 5 white and 3 black balls. Two balls are drawn at random one after the other without



replacement. Find the probability that both balls drawn from the bag are black.

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**166.** Tickets numbered from 1 to 20 are mixed up together and then a ticket is drawn at random.

In how many ways one ticket can be drawn.

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**167.** Tickets numbered from 1 to 20 are mixed up together and then a ticket is drawn at random. Find the

probability that the ticket drawn has a number which is a multiple of 3 or 7.

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**168.** Tickets numbered from 1 to 20 are mixed up together and then a ticket is drawn at random. Find the probability that the ticket drawn has a number which is a multiple of 3 or 7.

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**169.** Three dice are thrown simultaneously. Find the sample space





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**170.** Three dice are thrown simultaneously. write the event that all the three dice show the same number as a set.



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**171.** Three dice are thrown simultaneously. Find the probability that all the three dice show the same number.



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**172.** A word consists of 9 letters: 5 consonants and 4 vowels. Three letters are chosen at random. In how many ways can these 3 letters be chosen.

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**173.** A word consists of 9 letters: 5 consonants and 4 vowels. Three letters are chosen at random. In how many ways more than one vowel can be selected.

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**174.** A word consists of 9 letters: 5 consonants and 4 vowels. Three letters are chosen at random. Find the probability that the selection of the three letters contains more than one vowel.



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**175.** From a group of 3 boys  $B_1, B_2, B_3$  and 2 girls  $G_1, G_2$ , 2 are selected at random. write the sample space.



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**176.** From a group of 3 boys  $B_1, B_2, B_3$  and 2 girls  $G_1, G_2$ , 2 are selected at random. In how many ways the 2 persons can be selected from the group



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**177.** From a group of 3 boys  $B_1, B_2, B_3$  and 2 girls  $G_1, G_2$ , 2 are selected at random. In how many ways 2 boys can be selected from the group



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**178.** From a group of 3 boys  $B_1, B_2, B_3$  and 2 girls  $G_1, G_2$ , 2 are selected at random. Find the probability that the two selected persons are boys.



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**179.** How many days are there in a non-leap year?



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**180.** How many complete weeks are there in a non-leap year?



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**181.** What is the probability that a non-leap year selected at random will contain 53 Mondays?



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**182.** Given the digits 1,2,3 and 8 How many two digit numbers can be formed using the given digits?



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**183.** A five digit number is formed at random by using the digits 1, 2, 3, 4, 5, 6 and 7. How many five digit numbers formed will have distinct digits?





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**184.** A five digit number is formed at random by using the digits 1, 2, 3, 4, 5, 6 and 7. Find the chance that the number formed has none of its digits is repeated.

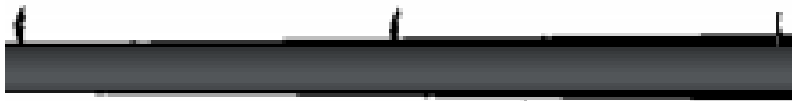


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**185.** Given that A and B are two events associated with a random experiment such that  $P(A)=0.5$ ,  $P(B)=0.4$  and

$P(A \cup B) = 0.7$ . Then match the following

Column : I	Column : II
$P(A \cap B)$	0.3
$P(\bar{A} \cap \bar{B})$	0.2
$P(\bar{A} \cup B)$	0.8



$P(\bar{A} \cup \bar{B})$	0.7
	0.4
	0.5



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**186.** Will the following statement be consistent? why?  
for two events A and B,  $P(A) = 0.4$ ,  $P(B) = 0.5$  and  
 $P(A \cup B)$  is 0.8.

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**187.** Will the following statement be consistent? why?  
for two events A and B  $P(A) = 0.3$ ,  $P(B) = 0.2$  and  $P(A \cap B)$   
is 0.1

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**188.** Will the following statement be consistent? why?  
for two events A and B  $P(A \cap B) = 0.4$   $P(A)=0.3$  and  
 $P(B)=0.1$

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**189.** The probability that a contractor will get a plumbing contract is  $\frac{2}{3}$  and the probability that he will not get an electric contract is  $\frac{5}{9}$ . The probability that he will get at least one contract is  $\frac{4}{5}$ . suppose A is the event that the contractor will get plumbing contract and B is the event that the contractor will get electric contract.  $P(A)=\dots\dots\dots$ ,  $P(B)=\dots\dots\dots$ ,  $P(A \cup B)=\dots\dots\dots$

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**190.** The probability that a contractor will get a plumbing contract is  $\frac{2}{3}$  and the probability that he will not get an electric contract is  $\frac{5}{9}$ . The probability that he will get at least one contract is  $\frac{4}{5}$ . Suppose A is the event that the contractor will get plumbing contract and B is the event that the contractor will get electric contract. Using addition theorem of probability find the probability that the contractor will get both the contracts.



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**191.** The probability that a contractor will get a plumbing contract is  $\frac{2}{3}$  and the probability that he will not get an electric contract is  $\frac{5}{9}$ . The probability that he will get at least one contract is  $\frac{4}{5}$ . Suppose A is the event that the contractor will get a plumbing contract and B is the event that the contractor will get an electric contract. Also find the probability that the contractor will get both the contracts.

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**192.** Two dice thrown at random find the probability that the sum of the numbers thrown is 7.

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**193.** Two dice thrown at random find the probability that the sum of the numbers thrown is 11.



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**194.** Two dice thrown at random Using addition theorem of probability find the probability that the sum of the numbers thrown is neither 7 nor 11.



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**195.** Two dice thrown at random By counting directly the number of elementary cases favourable to the event of getting a sum=7, or a sum=11 find the probability that the sum of the numbers thrown is neither 7 nor 11.



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**196.** A box contains 10 red marbles, 20 blue marbles and 30 green marbles.

5 marbles are drawn from the box, what is the probability that all will be blue.



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**197.** A box contains 10 red marbles, 20 blue marbles and 30 green marbles.

5 marbles are drawn from the box, what is the probability that at least one will be green.



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**198.** 4 cards are drawn from a well shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade?



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**199.** A die has two faces each with number 1, three faces with number 2 and one face with number 3. If the die is rolled once, determine  $P(2)$ .

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**200.** A die has two faces each with number 1, three faces with number 2 and one face with number 3. If the die is rolled once, determine  $P(1 \text{ or } 3)$ .

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**201.** A die has two faces each with number 1, three faces with number 2 and one face with number 3. If the die is

rolled once, determine  $P(\text{not } 3)$ .



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**202.** In a certain lottery ticket 10000 tickets are sold and

10 equal prizes are awarded

.What is the probability of not getting a prize, if you buy

1 ticket.



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**203.** In a certain lottery ticket 10000 tickets are sold and

10 equal prizes are awarded.

What is the probability of not getting a prize,if you buy 2 tickets.



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**204.** In a certain lottery ticket 10000 tickets are sold and 10 equal prizes are awarded.

What is the probability of not getting a prize,if you buy 10 tickets.



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**205.** Out of 100 students,two sections of 40 and 60 are formed.If you and your friend are among the 100

students, what is the probability that you both enter the same section?

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**206.** Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that you both enter the different section?

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**207.** Three letters are dictated to three persons and an envelope is addressed to each of them. The letters are

inserted into the envelopes at random so that each envelope contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

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**208.** A and B are two events such that  $P(A) = 0.54$ ,  $P(B) = 0.69$ , and  $P(A \cap B) = 0.35$  find  $P(A \cup B)$

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**209.** A and B are two events such that  $P(A) = 0.54$ ,  $P(B) = 0.69$ , and  $P(A \cap B) = 0.35$  find  $P(A' \cap B')$

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**210.** A and B are two events such that  $P(A) = 0.54$  ,  
 $P(B) = 0.69$  , and  $P(A \cap B) = 0.35$  find  $P(A \cap B')$



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**211.** Suppose A and B are two events associated with a  
random experiment so that  $P(A)=0.5$ ,  $P(B)=0.3$  and  
 $P(A \cap B) = 0.2$

$P(A \cap \bar{B})$



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**212.** From the employees of a company 5 persons are selected to represent them in the managing committee of the company. particulars of five persons are as follows:

Sl. No.	Name	Sex	Age in years
1.	Harish	M	30
2.	Rohan	M	33
3.	Sheetal	F	46
4.	Alis	F	28
5.	Salim	M	41

A person is selected at random from this group to act as a spokesperson. What is the probability that the spokesperson will be either male or over 35 years.



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**213.** IF 4 digit numbers greater than or equal to 5000 are randomly formed from the digits 0,1,3,5 and 7 what



is the probability of forming a number divisible by 5 when the repetition of digit is not allowed?

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**214.** IF 4 digit numbers greater than or equal to 5000 are randomly formed from the digits 0,1,3,5 and 7 what is the probability of forming a number divisible by 5 when the repetition of digit is allowed?

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**215.** The number lock of a suit case has 4 wheels each labelled with ten digits from 0 to 9 . the lock opens with

a sequence of four digits with no repeats. what is the probability of a person getting the right sequence to open the suitcase.



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