where students come first!

Year 12-General Mathematics


## Probability

## Practice Questions

## 1) Probability of an event:

1. (3 marks)

A die is rolled twice and the sum of the two uppermost faces is noted.
i) find probability that sum is greater than 9
ii) it is known that first dice gives 5 , using this find probability that sum is greater than 9.
2. (2 marks)

A die is biased so that the face showing 1 is likely to come up with a probability of 0.5 and the other 5 faces $(2,3,4,5,6)$ are equally likely to appear. Find the probability of:
i) a 6 appearing
ii) an odd number appearing
3. (3 marks)

Find the probability that a card drawn from a deck of 52 cards is:
i)red
ii) a club
iii) less than 10
4. (1 marks)

Find the probaiblity of me picking a blue or yellow ball from a bag containing 10 yellow, 3 blue, 4 green and 2 black.
(1 marks)
You have a notebook of 23 sheets of paper; and 3 of them are black. A page falls from your notebook; what is the probability is was a black sheet?
6. (1 marks)

A box contains 3 black ticket numbered 1, 2, 3; and 3 red tickets numbered 1, 2, and 3 . One ticket will be drawn at random and you have to guess the number on the ticket. What is the probability it is a '2'?
(1 marks)
what is probability of a coin coming up heads 10 times?

## 2) complimentary events:

1. (3 marks)

A bag has 3 red, 4 blue and 5 yellow marbles. Find the proability (if marbles drawn one at a time) that:
i) it is red
ii)it is not red
iii) it is not blue
2. (3 marks)
a red die and a blue die are thrown, what is the probability that the pair of dice show:
i) at least one six
ii) a total of 7
3. (3 marks)
it is found that $2 \%$ of eggs sampled at a farm are underweight. Find the probability that in a sample of 3 eggs:
i)one egg is underweight
ii) no eggs are underweight
4. (5 marks)

I have a $20 \%$ chance of winning blackjack and a 30\% chance of winning poker at a casino. Find the probability that i:
i) win both games
ii)not win both games
iii) win only one game
5. (3 marks)

Find the probability that a card drawn from a deck of 52 cards is:
i) not red
ii) not a club
iii) not a picture card
6. (2 marks)

In a random prize competition with one prize, abhi buys 10 tickets and girgis buys 5 tickets out of 600 tickets sold. Find the probabilty that:
i) girgis does not win
ii) abhi does not win
7. (3 marks)

A man can hit a target once in 4 shots. If he fires 4 shots in succession, what is the probability that he will hit his target?

## 3) Bias:

## 1. (2 marks)

A die is biased so that a 6 is 3 times as likely to be shown as any other number. What is the probability of throwing a 6 ?
2. (2 marks)

A coin is biased so that a tail is twice as likely to be shown as a head. Find the probability of tossing a head with this coin?

## 4) Multistage events:

1. (4 marks)

A die is thrown and a coin is tossed, what is the probability of getting:
a) a 5 or a head or both?
b) a number less than 3 and a tail?
c) a tail and an odd number?
2. (4 marks)

Two dice are thrown, find the probabilty that the sum of the two numbers is:
a)6,
b) even,
c) odd,
d) a multiple of 4,
e)any double

## 5) The sum and product thereoms of probabilty:

## 1. (2 marks)

What is the probability that two dice (with 6 faces) both show 4 on the uppermost face?
2. (3 marks)

8 black and 5 yellow discs are placed in a bag and 12 black and 10 yellow discs in a second bag. A disc is drawn from each bag. What is the probability of:
i)a black disc being drawn from the first bag
ii) a yellow disc being drawn from the second bag
iii) a black and a yellow disc being drawn
3. (2 marks)

Abhi plays a game where he must spin a dial over a circle split into 5
sectors. In this game he must pick 2 sectors and if one of these two are spun he moves on to pick a side on a dice and roll it. Find the probabilty that Abhi wins both parts of the game.
4. (2 marks)

In a bag their are 6 identical cubes except for their colour, where 2 are red and 4 are green. If two cubes are drawn at the same time, find the probability that they are differnt colours.
5. (2 marks)

Three cards are chosen at random from a deck without replacement.
What is the probability of getting a jack, a ten and a nine in order?
6. (2 marks)

A city survey found that $47 \%$ of teenagers have a part time job. The same survey found that $78 \%$ plan to attend college. If a teenager is chosen at random, what is the probability that the teenager has a part time job and plans to attend college?
7. (2 marks)

In a shipment of 100 televisions, 6 are defective. If a person buys two televisions from that shipment, what is the probability that both are defective?

## 6) Venn diagrams

## 1. (4 marks)

In a sample of 70 students, 35 take chemistry, 25 take physics and 10 take both. Find the probability that a student chosen at random:
i) takes chemistry or physics
ii) doesnt take either chemistry of physics.

## 2. (4 marks)

in a town of 3000 people, 900 are lebanese, 1100 are chinese and 1500 are neither. If one person is chosen at andom, find the probability that this person is:
i) both lebanese and chinese
ii) chinese only
3. (4 marks)

Out of forty students, 14 are taking English and 29 are taking Chemistry. If five students are in both classes, Find the probability of a student:
a) doing neither,
b) doing chemistry,
c) doing english

## 7) Independant and dependant events and replacement/non-replacement:

1. (3 marks)

Abhi had 4 similar keys in his pocket. To open the front door he tried the keys at random and did not try the same key twice and stopped when the door opened. Find the probability that:
i) the door opened on the first key
ii) he tried all 4 keys before the door opened
2. (2 marks)

Two cards are chosen from 7 cards labeled: $-2,-1,1,2,3,4,5$ with out replacement. Find the probability that the Product of the two numbers is not negative.
3. (4 marks)
a bag contains 4 blue balls, 3 red balls, 2 yellow balls and 1 green ball. three balls are selected at random without replacement from the bad. Find the probabililty that:
i) three balls are blue
ii) three balls are same colour
iii) exactly two of balls are blue
4. (2 marks)

A box contains 6 blue, 3 red and 5 green cards and the cards are selected at random with three selected at a time without replacement. Find the probability that:
i) all the cards are red
ii) none of the cards are blue

## 5. (2 marks)

there are 5 blue and 4 green lollies in a bag. two balls are draw after eachother, Find the probability that both lollies are blue if:
i) the first lollie drawn is replaced before the second one is drawn
ii) the first lollie drawn is not replaced before the second one is drawn
6. (3 marks)

In a deck of 52 cards, you select 4 cards and put them aside. Find the probability that the 2 card is a queen of hearts and the third card is a black jack.
7. (2 marks)

In a deck of 52 cards, you select 3 cards and put them aside. Find the probability that the third card is a black jack.
8. (2 marks)

In a deck of 52 cards, you select 4 cards and put them aside. Find the probability that the 2 nd card is a queen of hearts.
9. (2 marks)

A box contains 3 tickets: coloured red, white and blue, two tickets will be drawn at random without replacement. What is the chance of drawing the red ticket and then the white?

## 8) Ordered selections (Permutations) and unordered selections (combinations):

1. (2 marks)
a group of 3 marbles are chosen from 9 marbles. How many ways can this be done if order is not important?
2. (2 marks)
there are 10 runners in a race. Find the probability that a runner comes first or second.
order does not matter:
(2 marks)
a committee of 4 people is to be chosen from a group of 8 . How many different committees can be formed?
order does not matter:
3. (4 marks)
a committee of 3 people is to be chosen from a group of 5 . Find the probabilty that Abhi (who is in the group of 5 ) will be chosen.
4. (4 marks)

A photographer is arranging a family of 5 for a photo and the family will stand in a row.
a) Find the possible ways they can be arranged,
b) Abhi is one of the family members, find the probability that Abhi will be in the middle of the row.
6. (4 marks)

10 runners will run a marathon, with 3 from the same country.
a) what is the probabilty of all three runners from the same country to come 1st, 2nd, 3rd in that order?
b) what is the probability that the runners come 1st,2nd, in any order?
7.
(3 marks)
There are 5 doors to a lecture room. What is the number of ways that a student enters the room and leaves it by different doors?

