

Exercise 1

Chance



	1	2	3	...	...
1	2	3	4	...	...
2	3	4	...	...	...
3	4	...	...	...	...

Two six sided dice, numbered 1 to 6, are rolled.

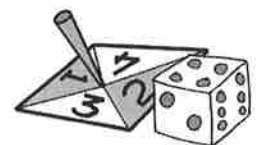
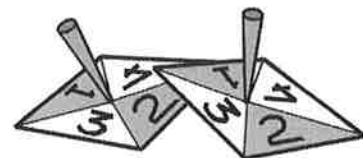
- List all the possible combinations for throwing both dice.
- Have you a better chance of throwing a total of 7 or a total of 12? *Explain.*
- State for each of the following which has the better chance and explain your answer.
 - Rolling any double or scoring a total of seven.
 - Throwing an odd total or an even total.
 - Scoring higher than a seven or rolling a total which is a prime number.

Exercise 2

Probability Expressed in Ratio Form



- A bag has 2 yellow, 5 green and 4 black marbles in it.
If a marble is chosen at random, find the probability of :-
 - $P(\text{yellow})$
 - $P(\text{black})$
 - $P(\text{green})$
 - $P(\text{orange})$.
- In a crate of juice, there are 3 bottles of cola, 2 of orange and 5 of water.
 - One is chosen at random. Find in simplest form :-
 - $P(\text{orange})$
 - $P(\text{cola})$
 - $P(\text{cherry})$
 - $P(\text{water})$.
 - If, when I choose one of the bottles I always put it back each time, how many times would I expect to get :-
 - orange from 10 picks
 - cola from 20 picks
 - cherry from 100 picks
 - water from 1000 picks?
- Two four sided spinners numbered 1 to 4 are spun.
 - List all the possible **totals** for the 2 spinners.
 - What is the probability of throwing :-
 - a seven
 - a double
 - a prime
 - higher than an 8?
- A four-sided spinner is spun and a six-sided dice rolled.
 - Write down all possible combinations of pairings.
 - Construct a table to show all the possible **totals** of the combinations.
 - What is the probability, (*simplify fully*), of scoring a total of :-
 - 5
 - 6
 - 8
 - 9
 - 10?



Exercise 3

Probability as a Fraction



1. A bag contains 4 white balls and 8 black balls. A ball is chosen at random.
What is the probability that it will be black ?

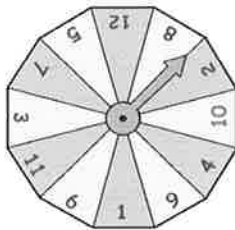
2. A box of chocolates has 8 strawberry creams and 12 coffee creams.
If a chocolate is chosen at random, what is $P(\text{coffee cream})$?



3. A six sided dice numbered 1 to 6 is rolled. Find :-
a $P(2)$ b $P(\text{even})$ c $P(\text{prime})$ d $P(> 3)$.

4. The names of 15 men and 25 women are put into the office raffle.
If a name is chosen at random, what is the probability that it will be a :-
a man b woman c neither a man nor a woman ?

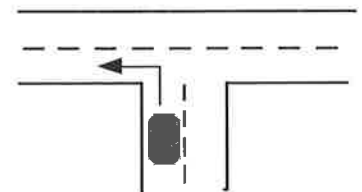
5.




A 12 sided spinner is spun until it stops on a number.
Find the following probabilities :-

- a $P(8)$ b $P(\text{odd})$
c $P(\text{multiple of } 3)$ d $P(\text{one digit number})$.
6. In a word game, letters are chosen at random from the word ONOMATOPOEIA.
Work out the following probabilities :-
a $P(O)$ b $P(E)$ c $P(\text{vowel})$ d $P(\text{not a vowel})$.
7. A pack of standard playing cards contains 52 cards.
A card is chosen at random. What is the probability that it will be :-
a a black card b a club c a four
d a red queen e smaller than 5 f a face card ?

8. The probability of my turning left at a T-Junction is 0.35.
What is the probability of me not turning left ?



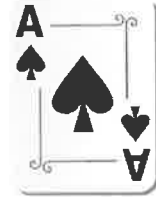
9.  The probability of choosing a caramel from a box of chocolates is 0.2.
When Bob counted, he discovered there were 6 caramels in the box.
How many chocolates were there in the box altogether ?

Exercise 4

Independent Events

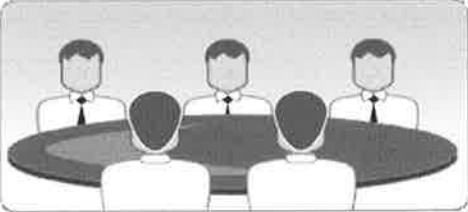
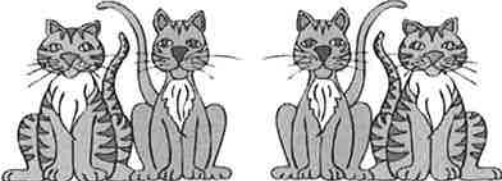


1. A coin is tossed and an 8-sided dice is rolled.
Find the probability of a :-
a head and then rolling a 6 b a tail and rolling an even number.
2. A card is chosen at random from a pack of 52 cards.
It is then replaced and a second card is chosen.
What is the probability of choosing a Queen and then an Ace ?
3. A bag contains 3 blue, 6 red, 2 green and 5 black balls.
A ball is chosen at random from the bag.
After replacing it, a second ball is chosen.
What is the probability of choosing a red followed by a black ball ?



Exercise 5

Dependent Events

1. Two cards are chosen at random from a pack of 52 cards without replacement.
What is the probability they are :- a both red b both Kings ?
2. Three cards are chosen at random from a pack without replacement.
What is the probability of choosing an ace, a King and a Queen in that order ?
3.  An office buys 40 PC's, but 4 are faulty.
Three PC's are randomly chosen and tested.
What is the probability all three are the ones which don't work if the first and second ones are not replaced after being tested ?
4. In a medical drug trial, 20 out of 100 people are given a placebo.
If three people are picked out at random without replacement,
what is the probability that all three got a placebo ?
5.  A survey found that 8 out of 10 cats prefer PussyCat Food.
If four cats are selected at random from a group of 10 cats, what is the probability that all four prefer PussyCat Food ?

Revisit - Review - Revise 13



1. A sack contains 6 grapefruit, 7 oranges and 13 tangerines.
 - a If one of these is picked at random, what is the probability it will be a tangerine ?
 - b If it is a tangerine and is **not** put back into the bag, what is the probability that the next item out will be an orange ?



2. A group of OAP's were asked how they stuck their teeth in. The results are shown in the table.

What is the probability, (simplest form), that an OAP chosen at random from this sample will :-

	<i>Method</i>	<i>Paste</i>	<i>Powder</i>
<i>Gender</i>			
<i>Female</i>		20	90
<i>Male</i>		60	30

- a use paste
- b be female and use powder ?

3. In a pie shop, the probability that a mince pie will remain in stock by the end of the day is known to be 0.15. One day, there were 6 mince pies left at closing time. How many must there have been in the shop that day to begin with ?



4. The probability of a lift breaking down is 0.002. If a lift makes 9000 trips per year, how many times should you expect it to break down ?



5. Two six-sided dice were thrown at the same time. By writing out **all** the combinations, calculate the probability of getting :-
 - a a double 2
 - b a total of 6 or less from both dice.

6. A bag contains 2 black balls, 4 red balls and a some blue balls. One of the balls is chosen at random. The probability of a red ball being chosen is $\frac{1}{4}$. How many blue balls must there be in the bag ?



7. A box contains 12 black, 20 blue, 8 red and 10 green counters. A counter is chosen at random from the box. After **replacing** it, a second counter is chosen. What is the probability of choosing a black and then a red counter ?