Probability- Likelihood of a particular event happening.

Words:

Many words are used to describe chance, and these include:

possible, likely, impossible, unlikely, maybe, certain, uncertain, no chance, little chance, good chance, highly probable, probable, improbable, doubtful, often, rarely and '50 - 50' chance.

Example 1

Describe by using a word or phrase the chance of the following happening:

a A woman will be playing netball at the age of 60.

b Sam, who is now 13, will be alive in 12 months time.

c The next person to enter the room at a co-educational school will be female.

a highly unlikely b highly likely c a '50 - 50' chance

EXERCISE 14A

1 Describe by using a word or phrase the chance of the following happening:

a A person will live to the age of 100 years.

b There will be a public holiday on the 1st day of January.

c A gigantic meteorite will strike the earth in your lifetime.

d You will win a prize in Lotto in your lifetime.

e Your birthday in three years' time will fall on a weekend day.

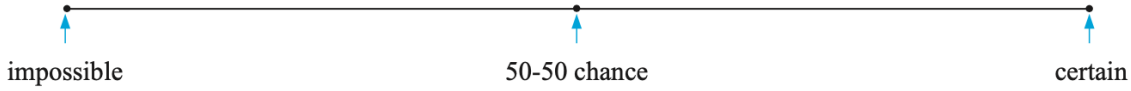
f You will get homework in at least one subject tonight.

g You will be struck by lightning next January.

h The sun will rise tomorrow.

i You could do 10 laps around the school grounds in 24 hours.

2 Below is a chance line. Copy it and add the following words to it using arrows where necessary:



a doubtful **b** very rarely **c** almost certain **d** highly likely
e unlikely **f** a little more than even chance

3 A bag contains 100 marbles, of which 99 are white and one is black. A marble is randomly chosen from the bag.

a How likely is the marble to be white?
b Is it certain that the marble is going to be white?
c True or false: "There is a 1 in 99 chance it could be white."

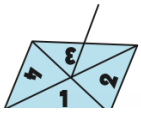
4 A tin contains 8 blue and 9 white discs and one disc is randomly selected from the tin.

a Is it more likely that the disc is blue than it is white? Explain.
b What colour is more likely to be selected?
c True or false: "There is a 9 in 17 chance that the disc is white"?

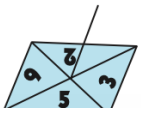
5 Describe the following events as either *certain*, *possible* or *impossible*:

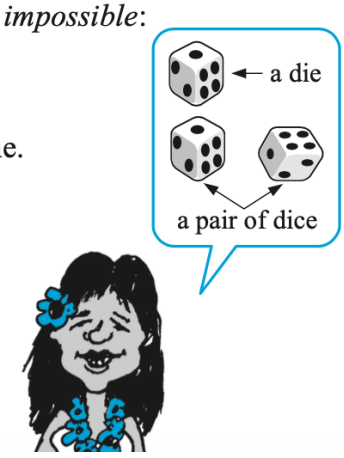
a When tossing a coin, it falls heads uppermost.
b When tossing a coin, it falls on its edge.
c When tossing a coin ten times, it falls heads every time.
d When rolling a die, a 4 results.
e When rolling a die, a 9 results.
f When rolling a pair of dice a sum of 13 results.
g When twirling a square spinner a 4 results:

i



ii





B ASSIGNING NUMBERS TO CHANCE

If an event **cannot occur**, i.e., it has no chance of occurring, we assign the number 0 or 0%.
If an event is **certain to occur** we assign the number 1 or 100%.

Because of this, we would hope to assign numbers between 0 and 1 (or 0% and 100%) to any event which we consider.

The chance of any event occurring must appear between the two extremes of impossible and certain. So, the probability of any event occurring lies between 0 and 1 (inclusive).

Events which may or may not occur with equal chance are assigned the probability number 0.5 or $\frac{1}{2}$. These events both have a 1 in 2 chance of occurring.

Example 2

Assign the probabilities 0, 0.5 or 1 to best describe:

a the chance of a new born baby being a boy
b the chance of man being 4 m tall
c the chance that the sun emits light tomorrow.

a Girls and boys occur equally often (roughly so anyway)
∴ the chance of a boy is 0.5.

b Historical records indicate that no human has ever reached 4 m in height
∴ the chance is 0.

c The sun will emit light tomorrow
∴ the chance of light from the sun is 1.

EXERCISE 14B

1 A container has 6 red and 6 blue balls and one ball is randomly selected from it.

a What is the probability of selecting a red ball?
b If all blue balls are now removed, what is the probability of selecting:
i a red ball ii a blue ball?

2 Given is a probability number line:

Draw your own probability line and mark on it the approximate probabilities of:

a the sun not rising tomorrow
b a holiday on December 25th
c being born on a Monday
d being born on a weekend.

3 State whether the possible outcomes of the following events are equally likely or not:

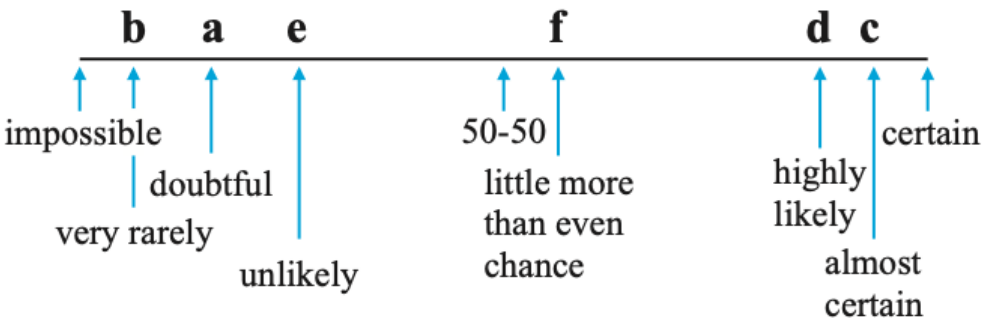
a selecting any card from a deck of 52 playing cards
b getting a result of 1, 2, 3, 4, 5 or 6 when a die is rolled
c selecting the winning bull from the 'best bull competition' at the Show
d a particular team winning the netball competition

Answers

EXERCISE 14A

1 **a** highly unlikely **b** certain **c** highly unlikely
d highly unlikely **e** unlikely **f** highly likely
g highly unlikely **h** certain **i** certain

2



3 **a** 99 in 100 **b** No **c** False

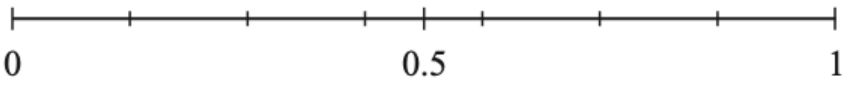
4 **a** No, there are fewer blue discs than white discs.
b white **c** true

5 **a** possible **b** possible **c** possible **d** possible
e impossible **f** impossible
g **i** possible **ii** impossible

EXERCISE 14B

1 **a** $\frac{1}{2}$ **b** **i** 1 **ii** 0

2 **a** **c** **d** **b**



3 **a** equally likely **b** equally likely
c not equally likely **d** not equally likely