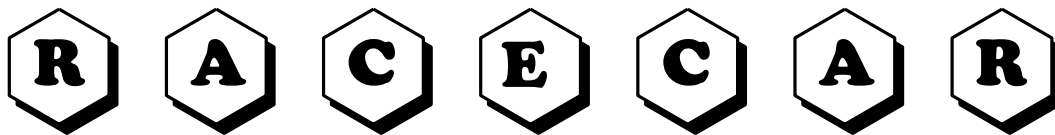


11.1 Homework (Revision)

Question 1



One letter is chosen at random from the word R A C E C A R.

- (a) What is the probability that it is;
- (i) C
 - (ii) not E
 - (iii) Q
 - (iv) a vowel
- (b) This word reads the same when read
- from left to right
 - from right to left

What is such a word called ?

Question 2

An icosahedral die is rolled.

Its twenty faces are numbered as would be expected.

i.e. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

- (a) What is the percentage probability that the number rolled is;
- (i) 13
 - (ii) > 14
 - (iii) prime
- (b) If this die were rolled 400 times, how many 9s are expected ?

Question 3

In a bag of "maths shapes" are

- 15 septagons
- 5 nonagons
- 5 triangles

(a) What is the percentage probability that a shape picked at random is a

(i) septagon

(ii) nonagon

(iii) not a triangle

(b) How many sides has a septagon ?

Question 4

A *biased* die rolls scores of 1, 2, 3, 4, 5, 6 with these percentage probabilities;

Score	1	2	3	4	5	6
Probability (%)	21%	24%	19%		11%	17 %

State the percentage probability that the score obtained is a

(i) 3

(ii) an odd number

(iii) 2 or 5

(iv) 4

(v) not 1

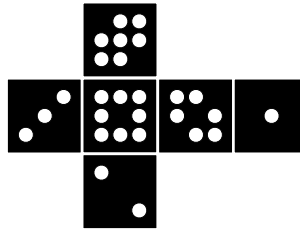
Question 5

The probability that it will rain tomorrow is 13.7%.

What is the percentage probability that it will not rain tomorrow ?

Question 6

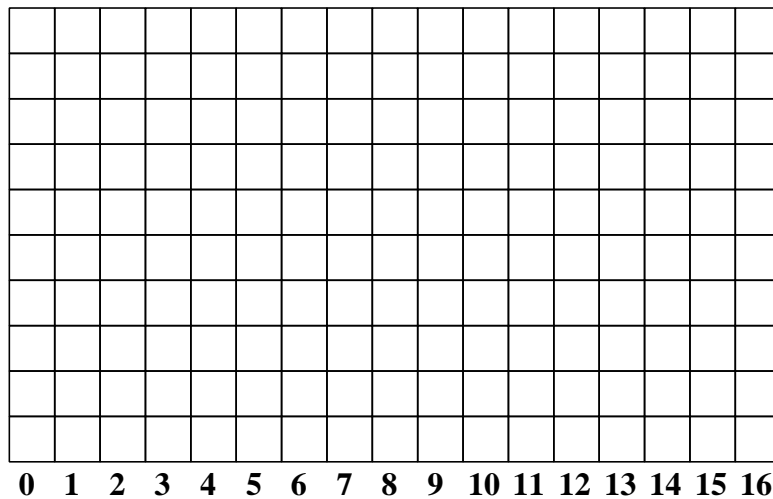
The net of a *Lucky-Strike Dice*TM is shown :



One orange and one blue *Lucky-Strike Dice*TM are rolled.
The pips showing are added together.

(a) Complete this possibility space diagram to show the thirty-six possible results.

(b) Plot a bar chart of the probabilities.



- (c) (i) Which score occurs most often ?
- (ii) Of the possible scores rolled, which are least likely ?
- (iii) What is the probability of rolling an odd number ?

Question 7

Michael is trying to decide what to buy his mum for Mothers' day.

Unable to decide, he uses a tetrahedral (four faced) die.

The possibilities are;

- ◇ **Perfume**
- ◇ **Jewellery**
- ◇ **Flowers**
- ◇ **Chocolate**

However, he thinks the die may be *biased* (not fair) and so rolls it 40 times.

Here are the results with the Chocolate rolls missed out.

Jewellery	Jewellery	Perfume	Jewellery	Flowers
Jewellery	Perfume	Flowers	Jewellery	Flowers
Perfume	Jewellery	Perfume	Perfume	Jewellery
Flowers	Perfume	Jewellery	Perfume	Perfume
Jewellery	Perfume	Flowers	Jewellery	Perfume

Complete the following tables;

Table of the experiment's frequencies.

Roll	Perfume	Jewellery	Flowers	Chocolate
Frequency				

Table of the experiment's probabilities.

Roll	Perfume	Jewellery	Flowers	Chocolate
Probability (%)				

What can you say about this tetrahedral die ?

Question 8

In this question, don't cancel down any fractions.



One letter is chosen at random from the letter tiles.

It is replaced.

Then a second letter is chosen at random.

Find the probability that the letters picked are;

(i) **B and B**

HINT : B and B
and means *multiply*
 $p(B) \times p(B)$

(ii) **L and L**

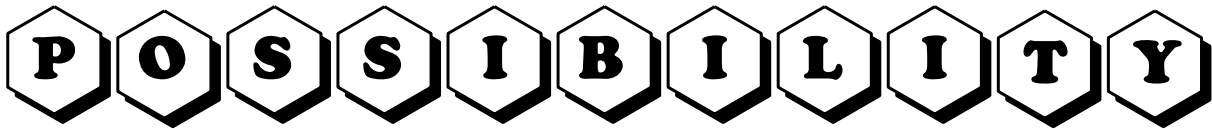
(iii) **O and O**

(iv) **D and D**

(iv) The same letter is picked twice.

HINT : B and B or L and L or O and O or D and D

Question 9



One letter is chosen at random from the letter tiles.

It is replaced.

Then a second letter is chosen at random.

Find the probability that the letters picked are;

(i) S first, *and* then T

(ii) S *and* T

(iii) I *and* I

(iv) vowel first, *and* then consonant

(v) vowel *and* consonant

(vi) two vowels

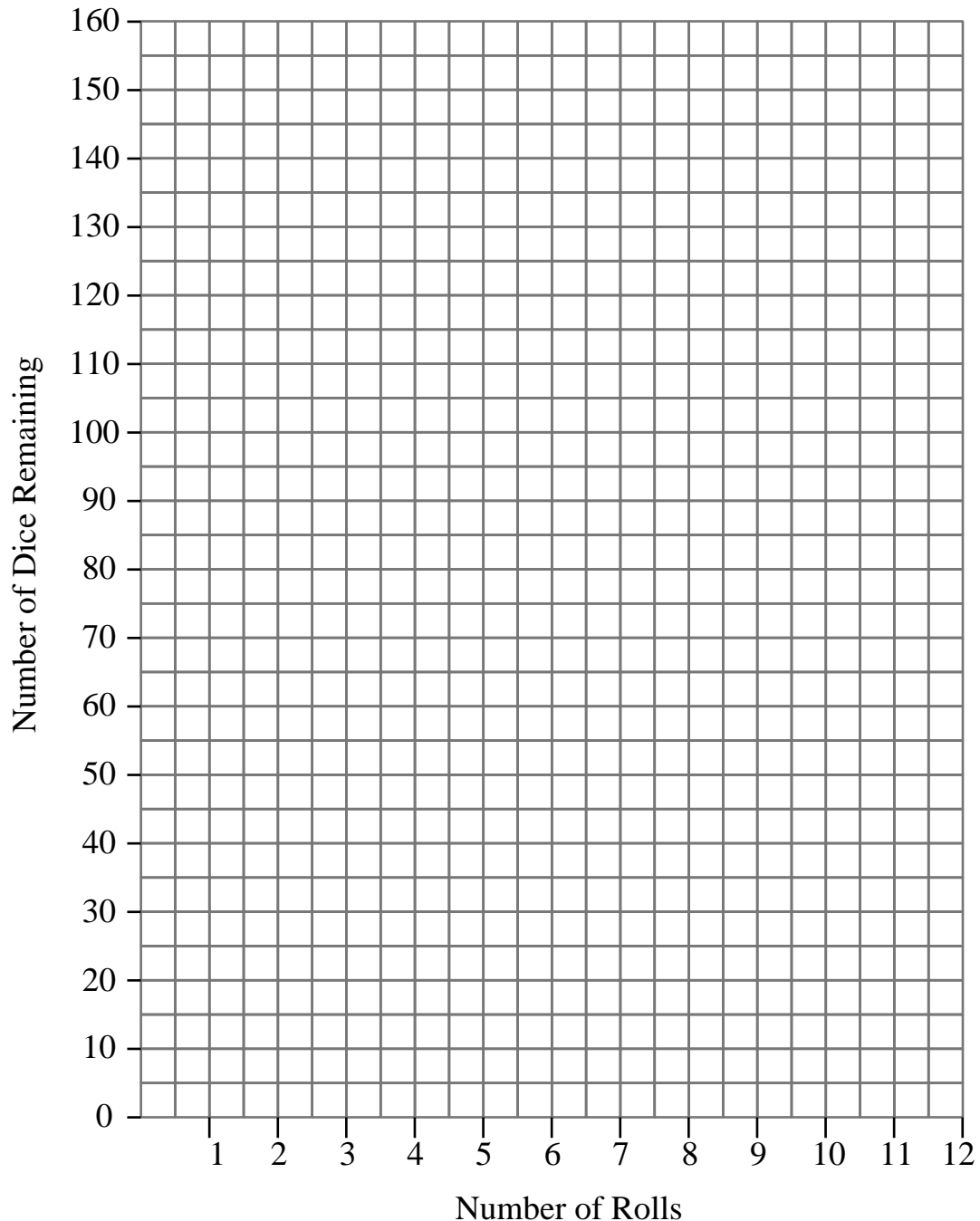
Question 10

Imagine that you've got 144 cubical (six-sided) dice.

You are going to roll them twelve times.

Each time you roll the dice, remove any that show a "6".

Plot a graph of the "Number of Dice Remaining" against the "Number of Rolls".



From your graph, after how many throws is the number of dice left less than half of what you started with ?

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In October 2020, Shrewsbury School was voted "**Independent School of the Year 2020**"

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk