Lesson 12

GCSE Mathematics
Probability

12.1 Revision

Marks available: 50

Question 1

One letter is chosen at random from the word R E V I V E R.

(a) What is the probability that it is;

(i) R

(ii) not V

(iii) Z

(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 ?

[5 marks]

Question 2

A fair octahedral die, with faces numbered 1, 2, 3, 4, 5, 6, 7, 8, is rolled.

(a) What is;

(i) p (3)

(ii) p (< 4)

(iii) p (prime)

(b) If this die were rolled 200 times, how many 7s would you expect ?

[4 marks]

Question 3
In a bag of "maths shapes" are

- 5 hexagons
- 8 octagons
- 7 squares

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

(i) hexagon

(ii) octagon

(iii) square

(b) What should the three answers of part **(a)** add up to ?

[4 marks]

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 (%)	12%	28%		15%	17%	13 %

State the percentage probability that the score obtained is a

(i) 5

(ii) an even number

(iii) 2 *or* 5

(iv) 3

(v) not 2

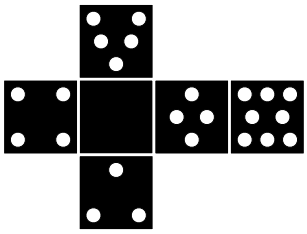
[5 marks]

Question 5
The probability that it will rain tomorrow is 24%.
What is the percentage probability that it will not rain tomorrow ?

[1 mark]

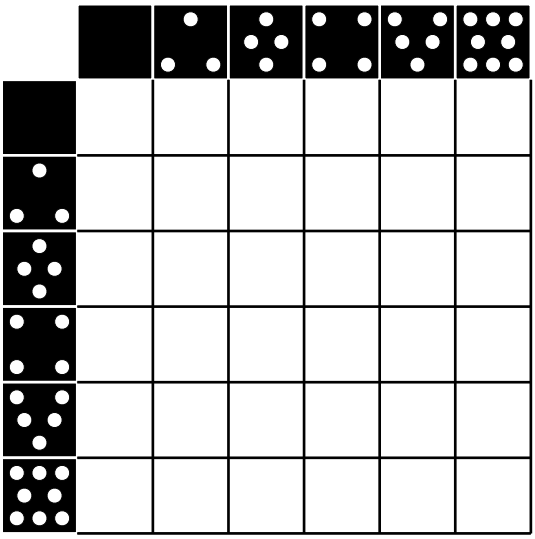
Question 6

The net of a *Racey Roller Dice*™ is shown :

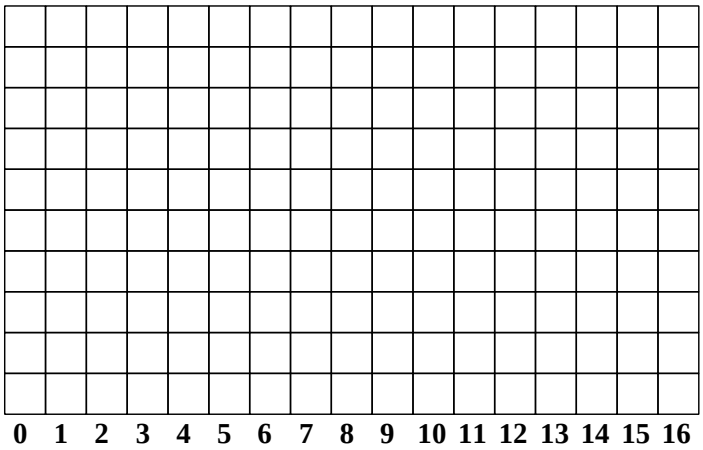


One red and one green *Racey Roller Dice*™ are rolled.
The pips showing are added together.

(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 ?

[5 marks]

Question 7

Each weekend Henry has used a tetrahedral (four faced) die to decide if he should;

- ◇ **Canoe**
- ◇ **Hillwalk**
- ◇ **Rock Climb**
- ◇ **Mountain Bike**

However, he thinks the die may be *biased* (not fair) and so rolls it 80 times.
Here are the results with the Mountain Bike rolls missed out.

Canoe	Rock	Rock	Hillwalk	Hillwalk
Rock	Canoe	Canoe	Rock	Hillwalk
Hillwalk	Canoe	Canoe	Hillwalk	Canoe
Canoe	Hillwalk	Rock	Canoe	Canoe
Hillwalk	Canoe	Rock	Canoe	Hillwalk
Canoe	Canoe	Canoe	Hillwalk	Hillwalk
Canoe	Hillwalk	Rock	Canoe	Canoe
Rock	Hillwalk	Hillwalk	Canoe	Hillwalk
Canoe	Hillwalk	Hillwalk	Canoe	

Complete the following tables;

Table of the experiment's frequencies.

Roll	Canoe	Hillwalk	Rock Climb	Mountain Bike
Frequency				

Table of the experiment's probabilities.

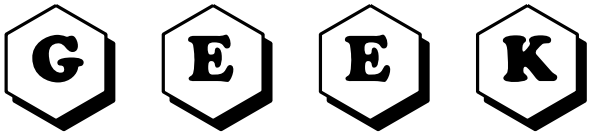
Roll	Canoe	Hillwalk	Rock Climb	Mountain Bike
Probability (%)				

What can you say about this tetrahedral die ?

[5 marks]

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) **G** *and* **G**

HINT : G *and* G
and means *multiply*
$p(\text{G}) \times p(\text{G})$

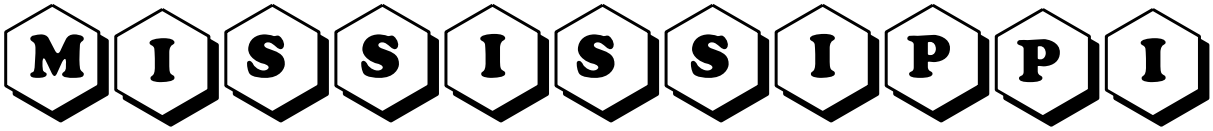
(ii) **K** *and* **K**

(iii) **E** *and* **E**

(iv) The same letter is picked twice.

[5 marks]

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) **M** first, *and* then **S**

(ii) **M** *and* **S**

(iii) **P** *and* **P**

(iv) vowel first, *and* then consonant

(v) vowel *and* consonant

(vi) two vowels

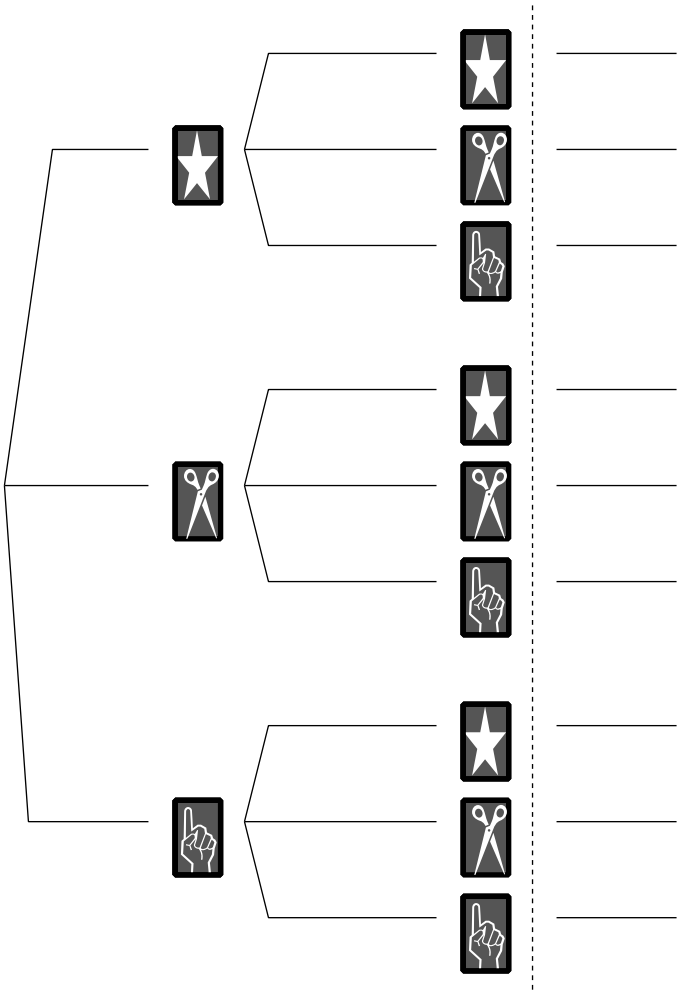
[6 marks]

Question 10

A pack of children's "snap" playing cards are shown below.

The cards are shuffled and then first one is placed face up on the table, then a second.

(i) Complete this tree diagram to show all possible outcomes.

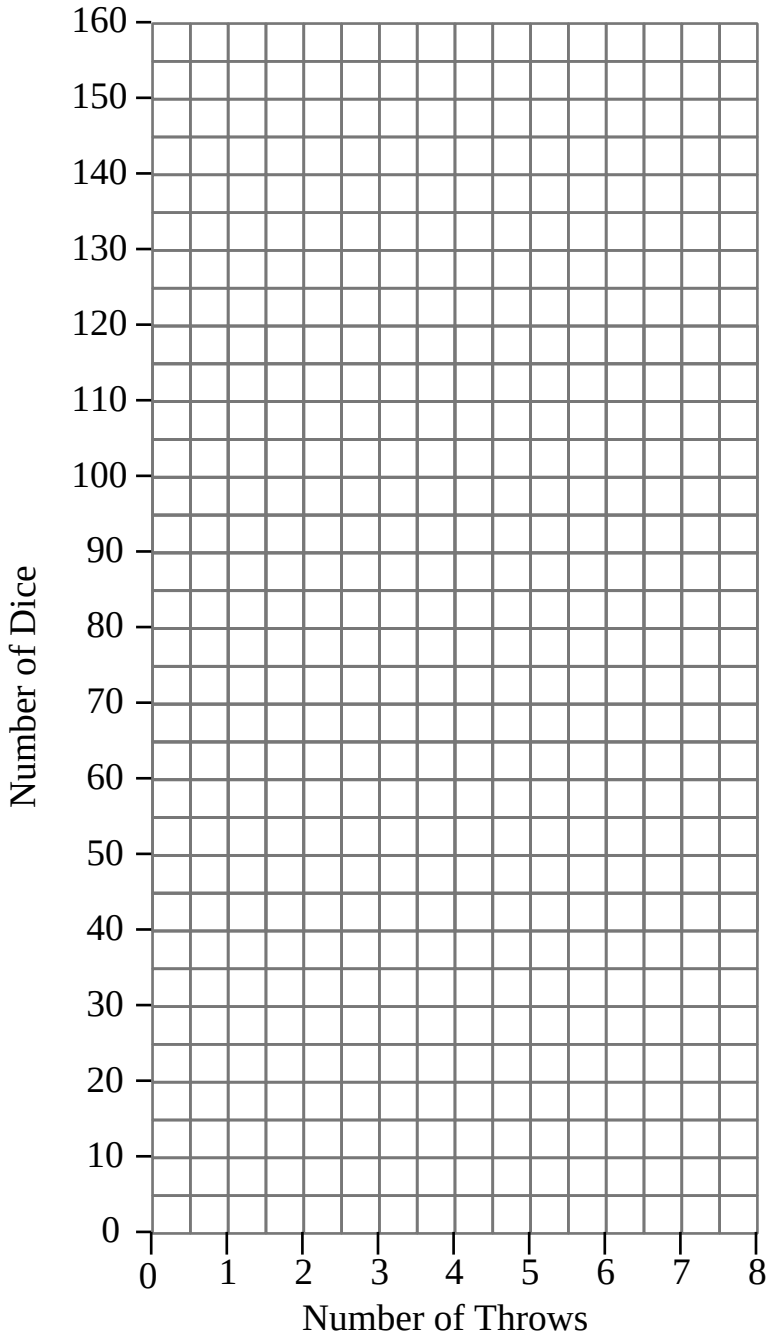


(ii) Use your tree diagram to determine the probability of a "snap".

[5 marks]

Question 11

Imagine that you've got 48 cubical (six-sided) dice.
You are going to roll them eight times.
Each time you roll all the dice, you add one die extra for every "6" that is showing.
Plot a graph of the "number of dice" against the "number of throws".



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

[5 marks]