Lesson 13

GCSE Mathematics
Probability

13.1 Test

Marks Available : 50

Question 1

One letter is chosen at random from the word R O T A T O R.

(a) What is the probability that it is;

(i) A

(ii) not R

(iii) T

(iv) a consonant

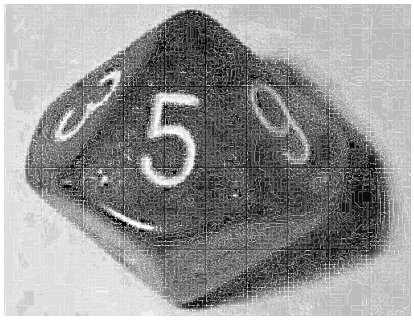
(b) This word reads the same when read

- from left to right
- from right to left

What is such a word called ?

[5 marks]

Question 2



A decahedral die, with faces numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 is rolled.

(a) What is the percentage probability that the number rolled is;

(i) 3

(ii) $\geqslant 4$

(iii) prime

(b) If this die were rolled 400 times, how many 9s are expected ?

[4 marks]

Question 3

In a bag of "maths shapes" are

- 12 decagons
- 8 pentagons
- 4 squares

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

(i) decagon

(ii) pentagon

(iii) square

(b) What should the three part **(a)** answers 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 (%)	15%	25%		15%	17%	16 %

State the percentage probability that the score obtained is a

(i) 2

(ii) an even number

(iii) 2 *or* 5

(iv) 3

(v) not 2

[5 marks]

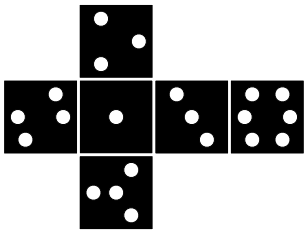
Question 5

The probability that it will rain tomorrow is 28.6%.
What is the percentage probability that it will not rain tomorrow ?

[1 mark]

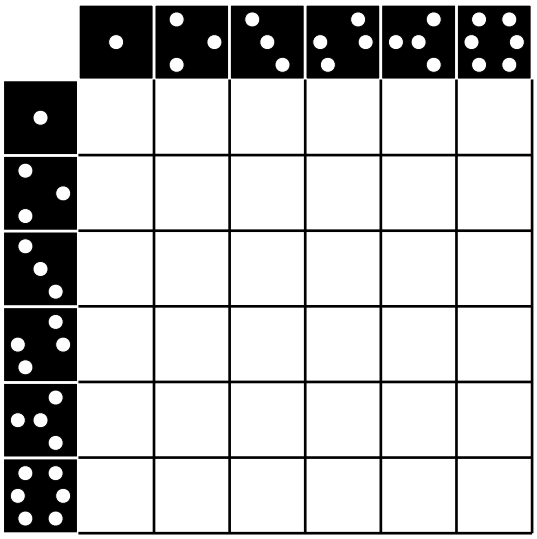
Question 6

The net of a *Lot-O-Luck Dice*™ is shown :

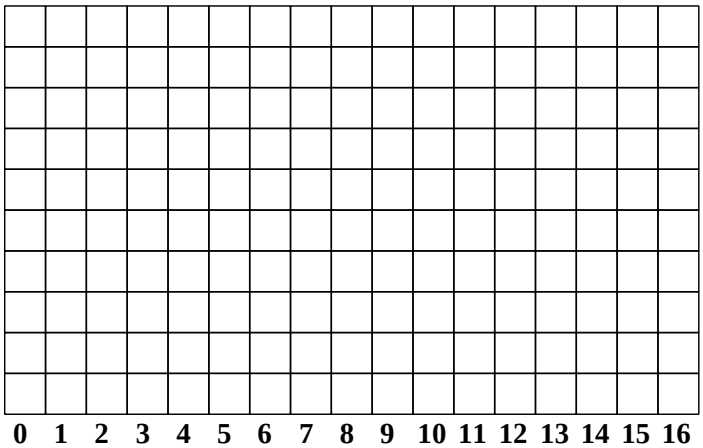


One pink and one green *Lot-O-Luck Dice*™ are rolled.
The pips showing are added together.

(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 even number ?

[5 marks]

Question 7

Every Friday evening Cedric uses a tetrahedral (four faced) die to decide if he should;

- ◇ Watch **TV**
- ◇ Go to **Bingo**
- ◇ Surf the **Web**
- ◇ Go night **Clubbing**

However, he thinks the die may be *biased* (not fair) and so rolls it 60 times.
Here are the results with the Clubbing rolls missed out.

TV	TV	TV	Bingo	TV
Bingo	Web	Bingo	TV	TV
TV	Bingo	TV	TV	Bingo
Web	TV	Web	TV	TV
TV	TV	Bingo	Bingo	Bingo
TV	Bingo	TV	TV	Bingo
Bingo	TV	Bingo	Bingo	TV
TV	TV	Bingo	TV	TV
TV	Bingo			

Complete the following tables;

Table of the experiment's frequencies.

Roll	TV	Bingo	Web	Clubbing
Frequency				

Table of the experiment's probabilities.

Roll	TV	Bingo	Web	Clubbing
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) **S** *and* **S**

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

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

(iii) **U** *and* **U**

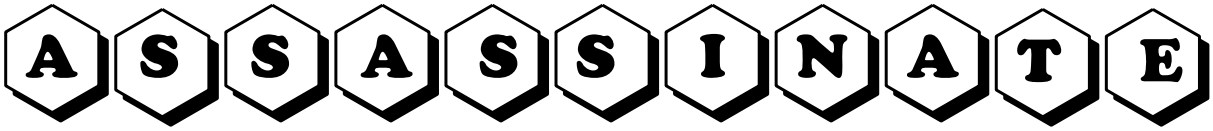
(iv) **L** *and* **L**

(iv) The same letter is picked twice.

HINT : S *and* S *or* K *and* K *or* U *and* U *or* L *and* L

[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) **A** first, *and* then **T**

(ii) **A** *and* **T**

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

(iv) vowel first, *and* then consonant

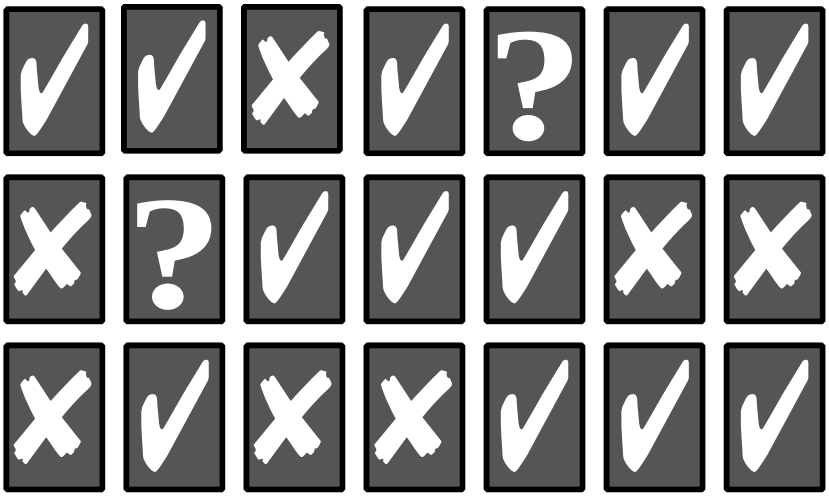
(v) vowel *and* consonant

(vi) two vowels

[6 marks]

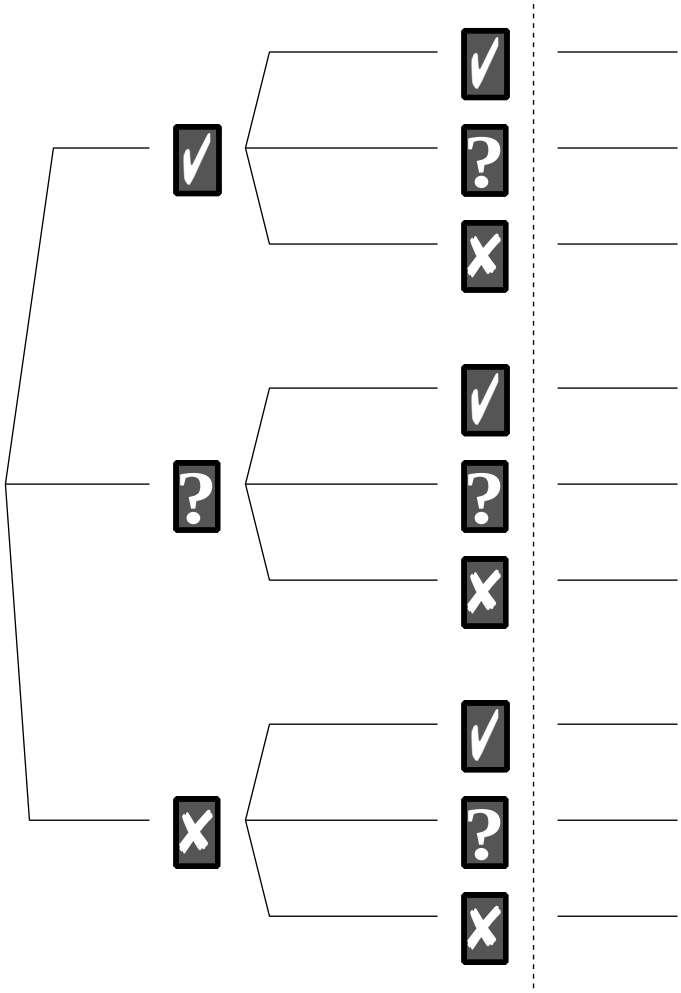
Question 10

A pack of children's "snap" playing cards is 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]

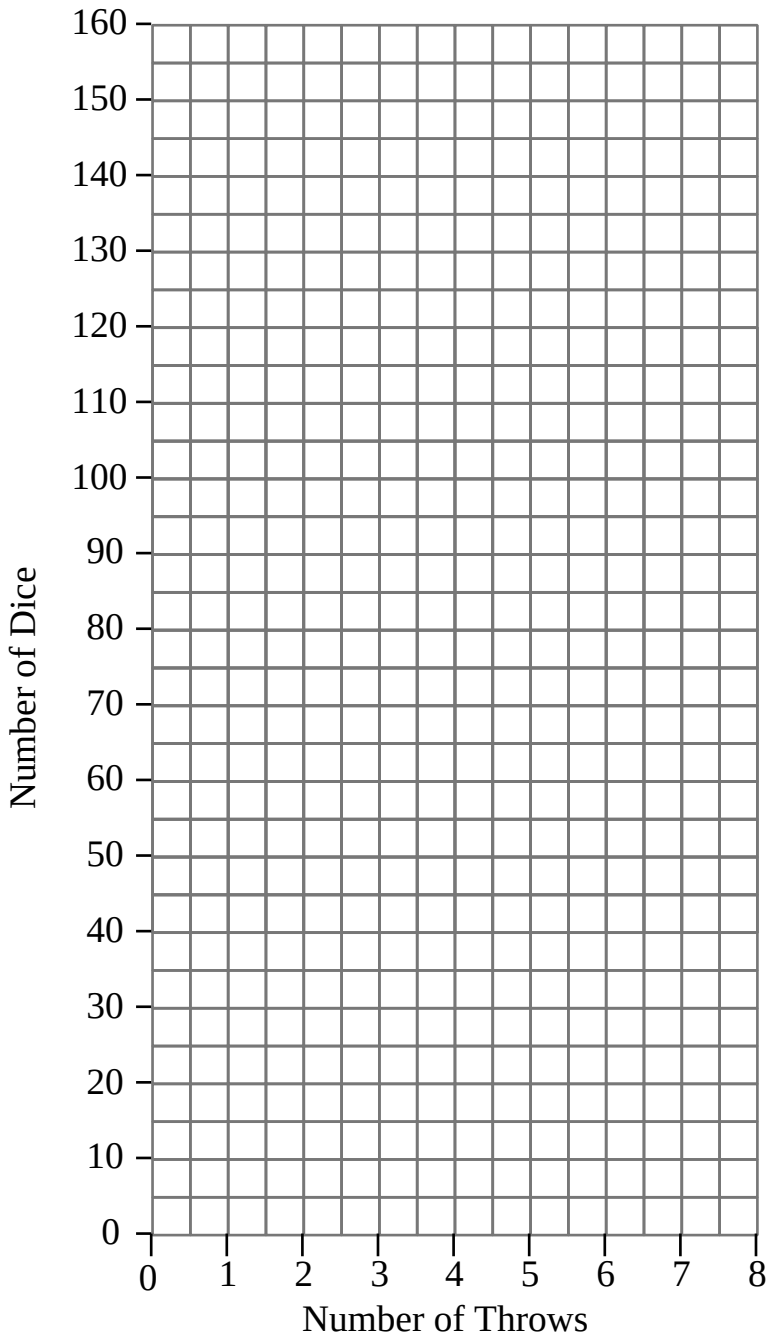
Question 11

Imagine that you've got 160 octagonal (eight-sided) dice.

You are going to roll them eight times.

Each time you roll the dice, remove any that show an "8".

(i) Plot a graph of the "Number of Dice" against the "Number of Throws".



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

[5 marks]