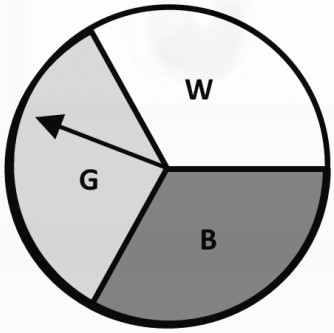
Name:

1

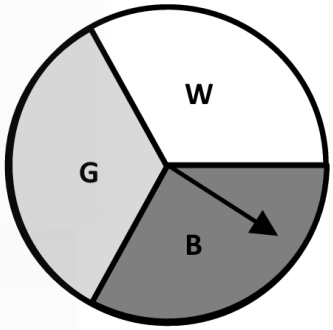
Question 3 **(25 marks)**

Two identical fair spinners are divided into three equal sections as shown.
The sections are coloured Black (B), Grey (G) and White (W).
The spinners are spun at the same time and the colours in which the pointers end up are noted.

First Spinner



Second Spinner



(a) **(i)** Complete the table below to list all the possible outcomes.
One is already done and G, B means Grey on the first spinner and Black on the second spinner.

		First Spinner		
		Black	**Grey**	**White**
Second Spinner	**Black**		G, B	
	Grey			
	White			

(ii) Find the probability of getting the same colour on each spinner.

(iii) Find the probability that the colour on one of the spinners is black and the colour on the other spinner is white.

(b) Gráinne is choosing her activities for Transition Year.
She must choose 1 activity from each of the groups below.
For example, she might choose Swimming, Bridge, and Art.

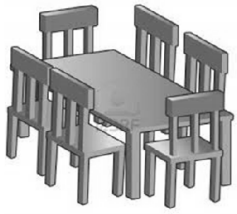
Activities		
Group 1	**Group 2**	**Group 3**
Swimming	Chess	Creative Writing
Basketball	Bridge	Drama
Hurling		Art

(i) How many different combinations of activities does Gráinne have?

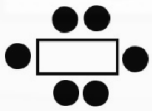
(ii) Because of an injury, Gráinne cannot take part in basketball or hurling.
How many different combinations of activities does she have now?

The following diagram shows an arrangement of tables and chairs in a sequence of patterns.

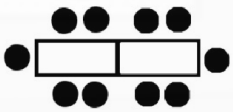
Note: ▭ = table, and ● = chair



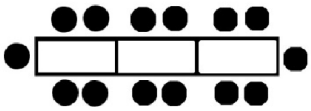
1st Pattern



2nd Pattern



3rd Pattern

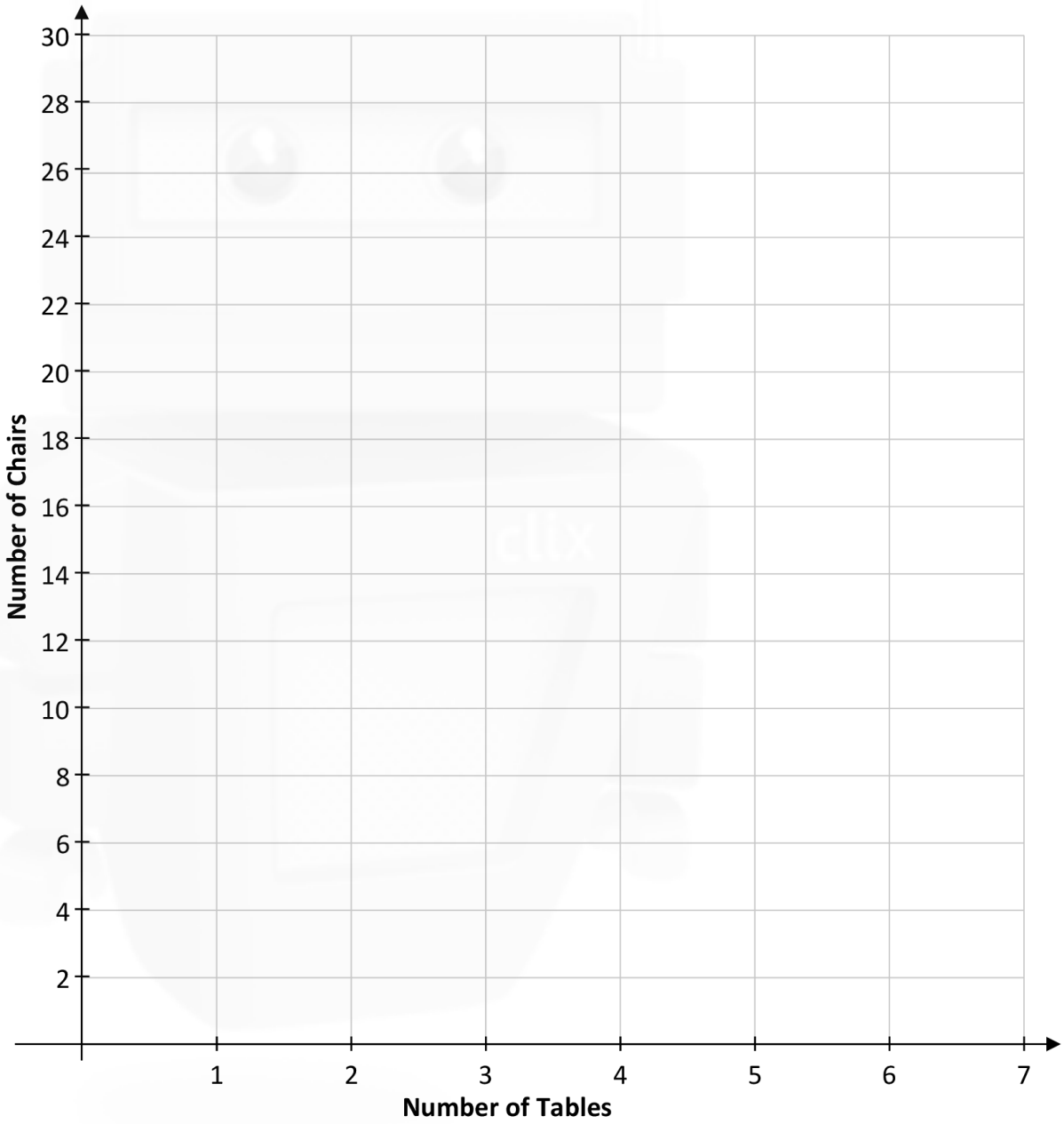


(a) Draw the 4th pattern in the sequence.

(b) Complete the table below to show the number of chairs in each of the first 6 patterns.

Number of Tables	Number of Chairs
1	6
2	
3	
4	
5	
6	

(c) Use your data from **part (b)** to graph the relationship between the number of tables and the number of chairs.



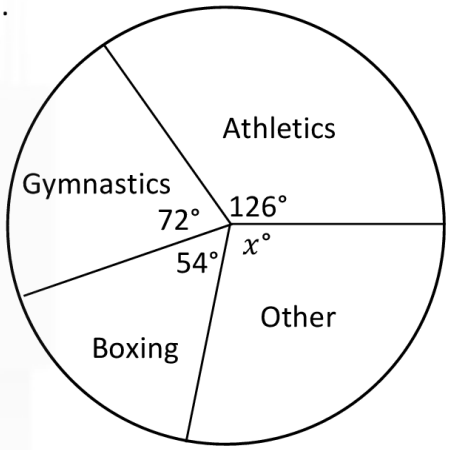
(d) How many chairs are there in the 10^{th} pattern?

(e) There are exactly 54 chairs in one of the patterns. How many tables are in that pattern?

(f) How many chairs, in total, are there in the first 7 patterns?

(g) Write a formula (in words) that shows the relationship between the number of chairs and the number of tables in any given pattern.

(a) Shane surveyed 240 people.
He asked them what their favourite Olympic sport was.
He then drew the pie chart shown, based on his results.



(i) Find the value of $x°$, the missing angle.
Show all your working out.

(ii) How many people said that gymnastics was their favourite sport?

(iii) What percentage of people said boxing was their favourite sport?

(b) Lena is three years older than Rory. In 5 years' time their ages added together will be 49 years.
What age is Rory now?

Aisling has a stack of 10 cards with a number printed on one side of each card.
The numbers used are

1 2 2 2 3 4 4 5 5 6.

She shuffles the cards, places them on a table with the number side down, and asks Joe to pick a card at random.

(a) Find the probability that the number Joe picks is a **2**.

(b) Find the probability that the number Joe picks is an even number.

(c) Find the probability that the number Joe picks is a **4** or a **5**.

(d) Aisling says: "The probability of picking an odd number is greater than the probability of picking an even number." Do you agree with Aisling? Give a reason for your answer.

Answer:

Reason:

(e) A card is picked from the stack and not put back. It is a **4**.
A second card is then picked at random from the remaining cards.
What is the probability that this second card is a **4**?

(a) A bag contains 6 yellow discs, 7 blue discs and 14 red discs.

(i) What is the total number of discs in the bag?

(ii) A disc is picked at random from the bag. What is the probability that the disc is red?

(iii) A disc is picked at random from the bag.
What is the probability that the disc is yellow or blue?

(b) There are girls and boys in a class.
16 of the students in the class are girls.
9 of these girls play hockey.

(i) A girl is selected at random from the class.
What is the probability that this girl plays hockey?

(ii) There are 28 students in the class. The remaining students are boys and 8 of these boys play hockey. A boy is selected at random from the class.
What is the probability that this boy plays hockey?

(iii) A student is selected at random from the class.
What is the probability that this student does **not** play hockey?

All of the digits 5, 3, 6, and 1 are used to write down a four-digit whole number.
Each digit is used only once.

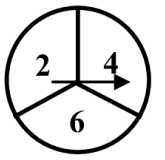
(a) **(i)** What is the biggest four-digit number that can be written?

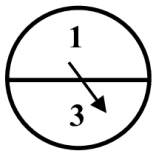
Answer: _____

(ii) What is the smallest four-digit number that can be written?

Answer: _____

Each of two fair spinners is divided into sections as shown. The spinners are spun at the same time and the scores are then added.





(a) Complete the table below to show all possible outcomes.

		First spinner		
		2	**4**	**6**
Second spinner	**1**			
	3		7	

(b) Find the probability of getting the following outcomes:

(i) 3

(ii) 3 or 9.

(c) Caleb says "An outcome of 5 is as likely as an outcome of 7". Is he correct?
Give a reason for your answer.

Answer:

Reason:

Question 1 **(25 marks)**

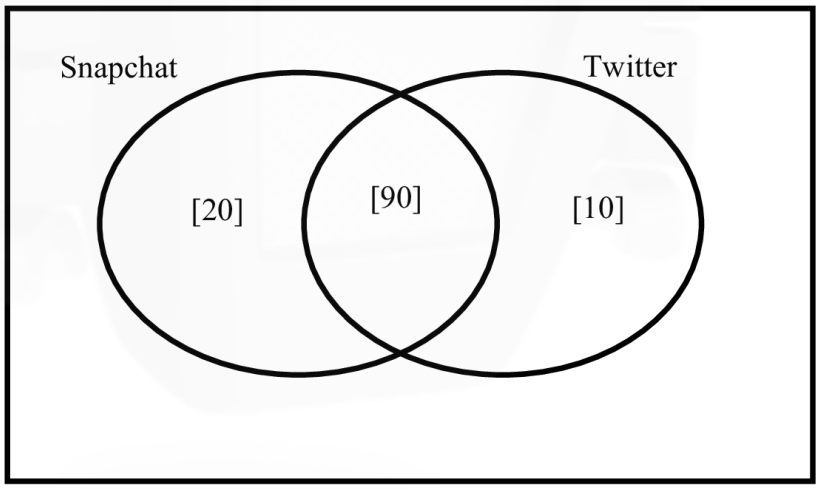
(a) In an experiment, a number is chosen at random from the set of numbers

$$\{2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 28, 30\}.$$

Some possible outcomes are listed in the table below.
Find the probability of each outcome and write your answers in the table.

Outcome	Probability
The number is odd.	
The number is even.	
The number is 25.	
The number is less than 8.	

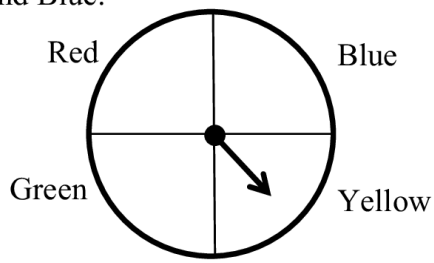
(b) Mary surveyed 150 students to find which social networking sites they use. Some of the results are shown in the Venn diagram below.



(i) Find the number of students who used neither of the two sites.

(ii) One student is chosen at random from those surveyed. Find the probability that the student used both sites.

(a) A fair spinner has four equal sectors, Red, Green, Yellow, and Blue.
The spinner is spun.



(i) What is the probability it stops on the yellow sector?

(ii) What is the probability it stops on the red or the green sector?

(iii) What is the probability it stops on any colour except blue?

(b) Joe plays a game with four coloured cards and a fair die. Each card is a different colour, as shown.

DIE

Joe picks a card at random and rolls the die. The table below shows some of the possible outcomes.

(i) Complete the table below.

	1	**2**	**3**	**4**	**5**	**6**
Black	B, 1					
White					W, 5	
Grey		G, 2				
Silver						

Find the probability that Joe will get:

(ii) A black card and a 6

(iii) A white or a grey card, and a 5

(iv) A silver card and an even number.

(a) **(i)** Answer each of the following:

What is the probability of an event that is certain to happen? _____.

What is the probability of an event that will never happen? _____.

What is the probability of an event that has a 50:50 chance of happening? _____.

(ii) In an experiment a standard fair die is tossed. In the context of that experiment give one example of each of the following:

an event that has a 50:50 chance of happening;

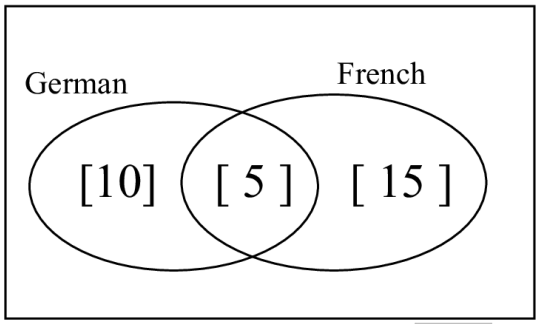
an event that will never happen;

an event that is certain to happen.

(b) The sets in the Venn diagram below represent the students in a class of 30 students who study German and French.

(i) How many students study both German and French?

Answer: _____



A student is picked at random from the class.

(ii) Find the probability that the student studies both German and French.

(iii) Find the probability that the student studies French but not German.

Sarah has a three-course lunch at a restaurant. She selects a starter, a main course and a dessert from the menu below.

Starters	Main course	Dessert
Melon	Roast beef	Fruit salad
Soup	Fish of the day	Chocolate brownie
Goats cheese salad	Vegetation curry	Apple crumble
Smoked salmon		Pear flan
		Ice cream

(a) Write one three-course lunch that Sarah could select.

(b) How many possible different selections can Sarah make?

(c) Assuming that each selection is equally likely, what is the probability that she selects:

- smoked salmon for her starter

Answer:_____

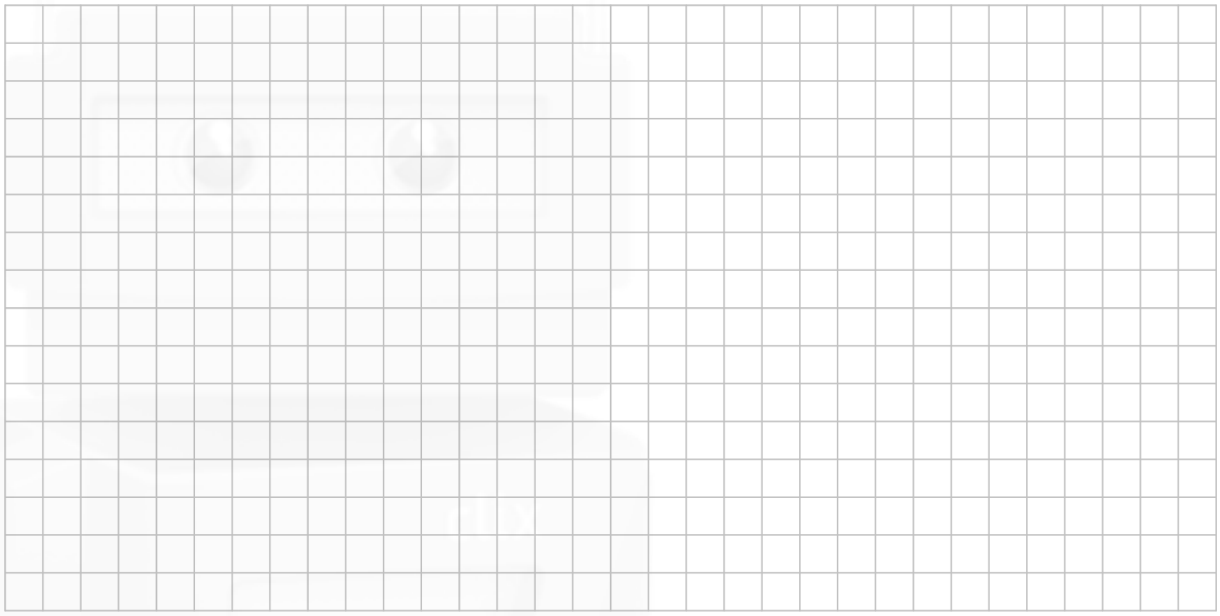
- smoked salmon for her starter followed by roast beef for her main course

Answer:_____

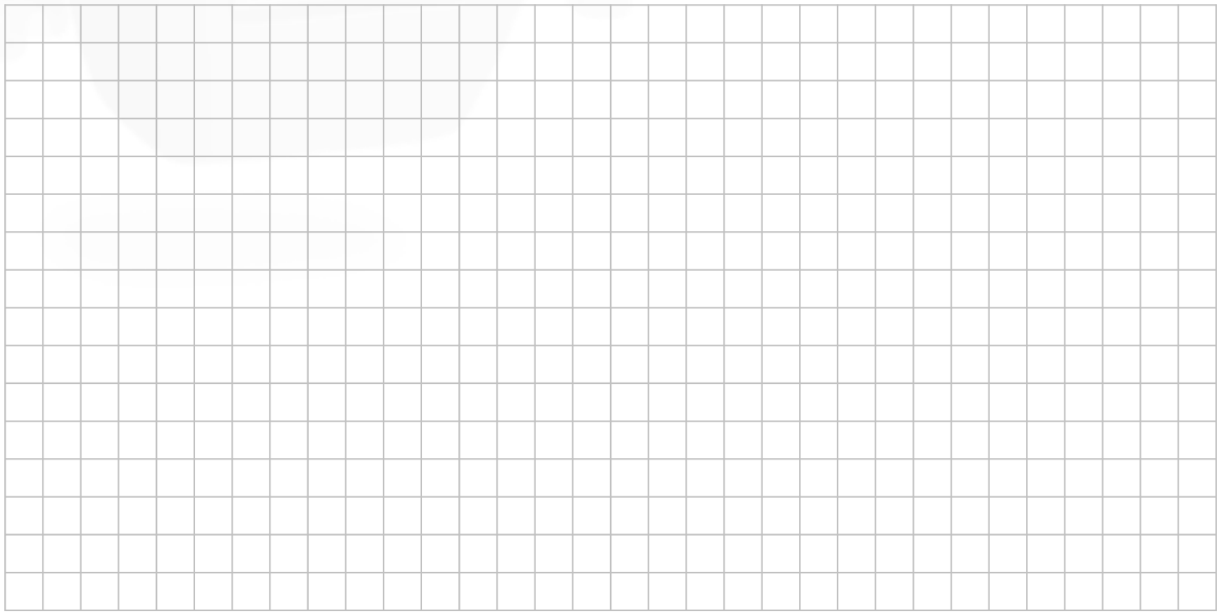
- smoked salmon for her starter followed by roast beef followed by fruit salad or ice cream for her dessert?

Answer:_____

(a) Give an example of an experiment with two outcomes that are *equally likely*, stating clearly what the two outcomes are.



(b) Give an example of an experiment with two outcomes that are **not** equally likely, stating clearly what the two outcomes are.



A girl and a boy are each asked to think of a whole number from 1 to 10. The outcome of this experiment is recorded as a pair of numbers. For example, if the girl picks 3 and the boy picks 1, this is recorded as (3, 1).

(a) Write out **three** possible outcomes of this experiment.

(b) How many different possible outcomes are there?

(c) Write out all of the outcomes in which the two children pick the same number.

(d) Suppose that all numbers are equally likely, and that one child's choice has no effect on the other's choice. What is the probability that the two children will pick the same number?

(a) A school canteen has the "lunch special" shown.
The following sandwiches and drinks are available.

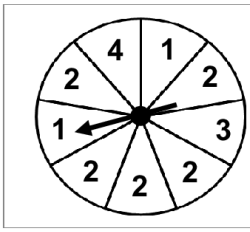
Sandwich	**Drink**
chicken	tea
cheese	hot chocolate
tuna	fruit drink
salad	
egg	

Lunch special:
Any sandwich
& any drink
€3

(i) What is the total number of different options available?

(ii) Orla doesn't like tuna or tea. How many different options does she have?

(b) A fair spinner is divided into nine equal sections.
The sections are numbered as shown.



Michael says:
"There's a greater than even chance that you'll get a 2."

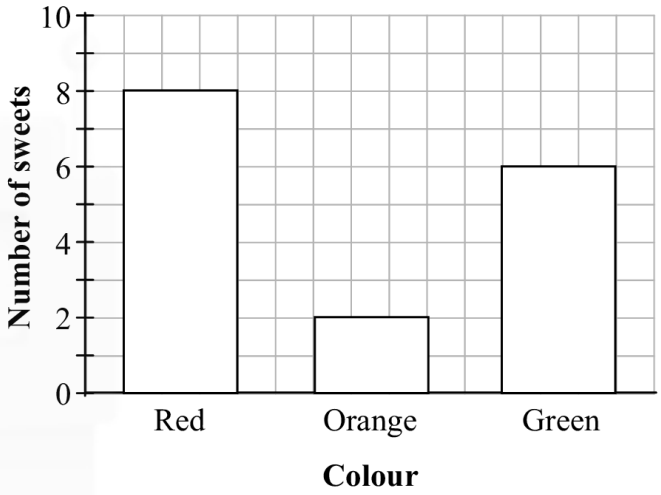
State whether Michael is correct and give a reason for your answer.

Answer: _____

Reason:

Robert has a bag of sweets.
The chart shows the number of red, orange and green sweets in the bag.

Robert picks one sweet at random from the bag.



(a) What is the probability that Robert picks a red sweet?

(b) What is the probability that Robert does not pick an orange sweet?

(c) The sweet that Robert picks is red. He eats it. He then picks another sweet at random from the bag. Is the probability that this second sweet is red *greater than*, *less than*, or *the same as* the original probability that the first sweet was red? Explain your answer.

Answer: _____

Explanation: