Name

Key to Five

Unit 9: Probability

The PiXL Ladder to Success

- Problem solving
- Combined probabilities
- Relative Frequency
- Use two way tables to calculate probabilities
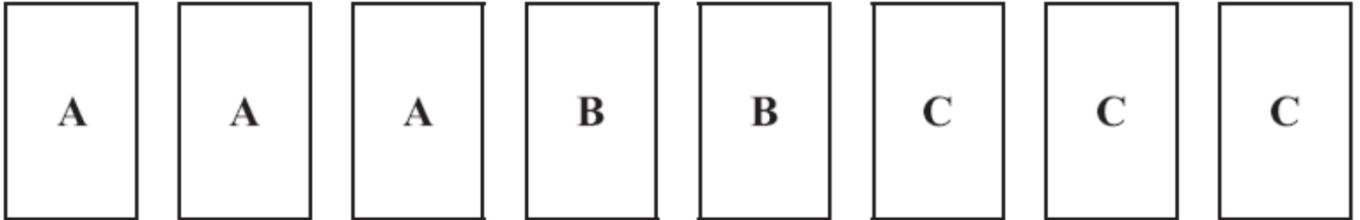- The probability scale

Section A

Question 1.
Here are some tiles.

Each tile has a letter on it.

| A | A | A | B | B | C | C | C |

Jeremy is going to take one of the tiles at random.

(*a*) Write down the probability that the tile he takes will have a C on it.

....
(2)

(*b*) Write down the probability that the tile he takes will **not** have an A on it.

....
(2)
(Total 4 marks)

Question 2

A bag contains

3 yellow counters,

2 blue counters,

4 red counters.
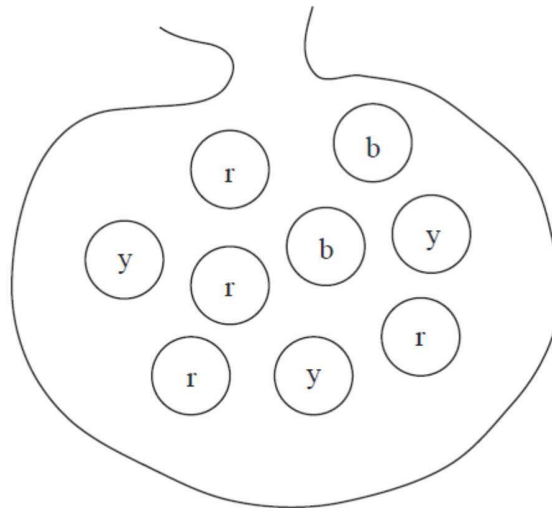
Jeff takes a counter at random   from the bag.

(*a*) Write down the probability that the counter will be red.

....
(2)

(*b*) Write down the probability that the counter will be yellow or blue or red.

....
(1)

(Total 3 marks)

Question 3.

Meela has a fair 6-sided spinner.

The sides of the spinner are numbered 2, 2, 2, 3, 3, 5.
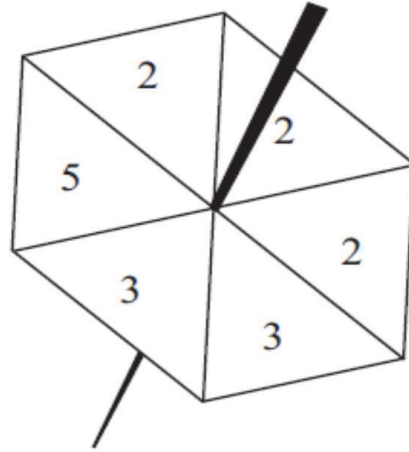
Meela spins the spinner once.

(*a*) Write down the probability that the spinner will land on a 3.

....
(1)

(*b*) Write down the probability that the spinner will land on a prime number.

....
(2)

(Total 3 marks)

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(*a*) I have a 20p coin, a 10p coin and a 2p coin.

Use this table below to help you to list all the possible outcomes of heads and tails for the three coins.

(You may not need all the rows in the table).

20p coin	10p coin	2p coin

(2)

(*b*) What is the probability of getting two tails and a head in any order?

....

(1)
(Total 3 marks)

Question 5.

Ron and Sarah play a game. They roll two normal fair dice and multiply the numbers to get their score.

(*a*) Complete the sample space diagram below to show all possible outcomes when they roll the dice.

		First die					
Multiply		**1**	**2**	**3**	**4**	**5**	**6**
	1						
	2					10	
Second die	**3**			9			
	4						
	5						
	6						

(3)

(*b*) Use the table to find (write fractions in their simplest form):

   (*i*) The probability of scoring 12.

....
(2)

   (*ii*) The probability of scoring more than 15.

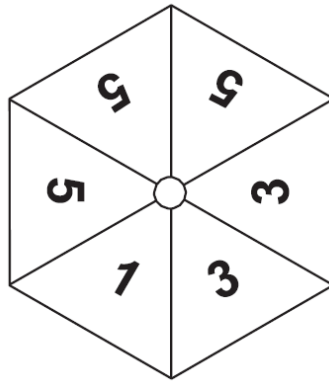..
(2)
(Total 7 marks)

Section C

Question 6.

An unbiased spinner is shown below.

(*a*) Write a number to make each sentence true.

　　(*i*) The probability that the spinner lands on the number .... is 0.5.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(1)

　　(*ii*) There is a probability of $\frac{1}{6}$ that the spinner will land on the number ....

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(1)

　　(*iii*) It is impossible that the spinner will land on number ....

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(1)

(*b*) The spinner **shown** has the following properties.

• There are eight equal sections, each showing one number.

• There are four different numbers on the spinner.

• The probability of the spinner landing on an odd number is greater than the probability of it landing on an even number.

• It is more likely that the spinner will land on a 3 than any of the other numbers.

Complete the spinner to show one possible arrangement of numbers.
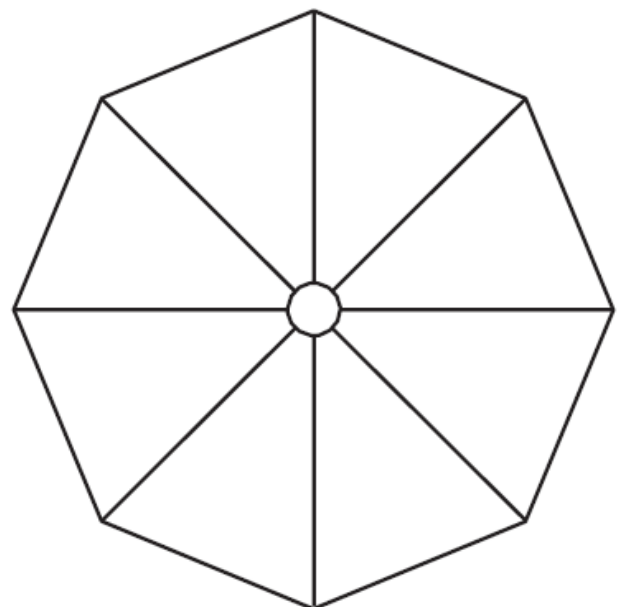
　　　　　　　　　　(3)
　　　　　(Total 6 marks)

Question 7.

(*a*) Lucy has a bag containing marbles.

2 are red, 4 are yellow and 6 are green.

She takes one of the marbles at random.

What is the probability that the marble is yellow?

....
(1)

(*b*) Andrew has a bag containing red counters and blue counters.

The ratio of red to blue counters is 1 : 3.

Andrew takes one of these counters at random.

What is the probability that it is red?

....
(1)

(*c*) Jemimah has a bag containing 28 counters.

The probability that a counter taken from the bag at random is white is $\frac{1}{4}$.
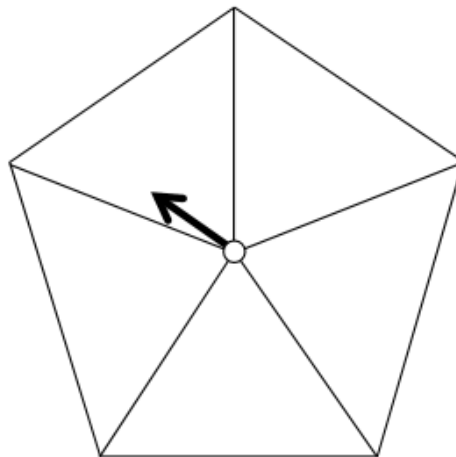
How many of the 28 counters are white?

....
(2)
(Total 4 marks)

Question 8.

This fair spinner has five equal sections.

Write a number on each   section so that :

- The probability that the   arrow lands on a 5 is $\frac{2}{5}$.

- The range of the   numbers is 4.

- The sum of the numbers is 28.

(2)
(Total 2 marks)

Question 9.

Nicole has a bag containing 7 red counters and 9 blue counters.

(*a*) Nicole picks a counter.

Write the probability that the counter is red.

....
(1)

(*b*) Nicole adds red counters to the bag so that the probability of picking a blue counter is now $\frac{1}{2}$.

How many red counters did she add?

....
(2)
(Total 3 marks)

Question 10

Bag A contains 8 white balls and 12 black balls.

Bag B contains 5 white balls and 5 black balls.

A ball is chosen at random from each bag.

Elaine says,

"It is more likely that a white ball is chosen from Bag A than Bag B because there are more white balls in Bag A."

Is she correct? You must show your working.

(3)

(Total 3 marks)

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Question 11.

A fair 6-sided die has the following properties.

- It has one number on each side.

- It has four different numbers.

- It has more sides with an even number on.

- It has a probability of $\frac{1}{3}$ of rolling a 2.

What could be a possible set of numbers?

....

(2)
(Total 2 marks)

Question 12.
Grace has a packet of ten hyacinth bulbs. They all look the same.

Seven of the bulbs will produce pink flowers and three will produce blue flowers.

A bulb is taken at random and planted then a second bulb is taken at random and planted.

Calculate the probability that the two bulbs will produce at least one blue flower.

....

(3)
(Total 3 marks)

Question 13.

There are twenty students in a class. Fourteen of the students are girls.

Two students are randomly selected from the class, what is the probability that a boy and a girl are chosen?

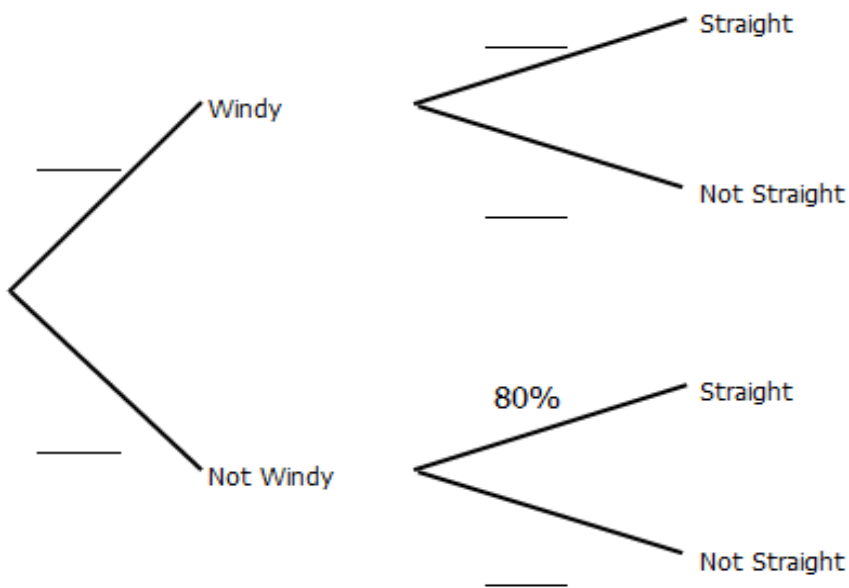...

(2)

(Total 2 marks)

Question 14.

A golfer observes that, when playing a particular hole at his local course, he hits a straight drive on 80% of the occasions when the weather is not windy but only 30% of the occasions when the weather is windy. Local records suggest that the weather is windy on 55% of all days.

a) Complete the tree diagram.

....
(2)

(*b*) Find the probability that the golfer hits a straight drive.

....
(3)

(Total 5 marks)

Question 15.

A fairground game is won when a hoop is thrown and lands on the red coloured pole.

Paul claims that the probability of winning on any go is $\frac{1}{4}$.

He charges 30p per go and awards a prize of 50p to winning throws.

(*a*) Paul expects 300 people to play in a day.
    Assuming his claim is true, how much profit will he make each day?

£..

(4)

(*b*) Chloe thinks that Paul is wrong.

She decides to conduct an experiment.

The table show the results.

	Blue	Red	Green	White
Frequency	60	12	85	24

Estimate the probability of winning from this experiment.

....

(3)

(Total 7 marks)

Question 16.

A machine used to pack crisps had 200 bags tested for weight.

10 of the bags were underweight.

(*a*) Estimate the probability that the next bag of crisps from the machine is underweight.

……

……

(1)

(*b*) The machine packs 500 bags.

How many would you expect to be underweight?

……

……

(1)

(Total 2 marks)

Question 17.

A car manufacturer wants to work out an estimate for the number of cars of each colour that will be bought next year.

The Managing Director says to record the colours of the next 100 cars sold.

The Assistant Director says to record the colours of the next 1000 cars sold.

Who is more likely to get the better estimate?

Give a reason for your answer.

……

……

(1)

(Total 1 mark)