1 Daniel has five bags of coloured sweets.
He picks at random a sweet from each bag.
The table shows the probability that the sweet he picks from each bag is red.

Bag	A	B	C	D	E
Probability of red	0.7	0.9	0.5	1	0.2

(a) From which bag is Daniel least likely to pick a red sweet?

.....

(1)

(b) Which bag contains only red sweets?

.....

(1)

(c) From which bag is Daniel equally likely to pick a red sweet as a sweet of another colour?

.....

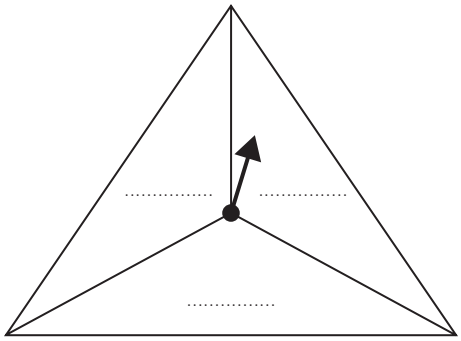
(1)

(Total for Question 1 is 3 marks)

2 Sandeep is designing some 3-sided spinners.

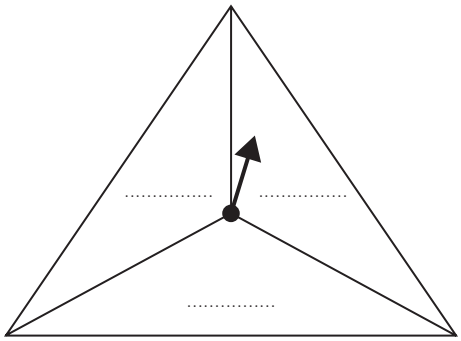
He is going to spin each spinner once.

(a) (i) Write a different number on each dotted line so that when the spinner is spun it is **impossible** that the spinner will land on a number greater than 9



(1)

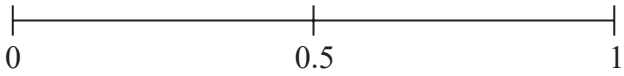
(ii) Write a different number on each dotted line so that when the spinner is spun it is **certain** that the spinner will land on a multiple of 10



(1)

The likelihood of an outcome is **evens**.

(b) On the probability scale, mark with a cross (×) the probability of this outcome.



(1)

(Total for Question 2 is 3 marks)

3 Caroline has a bag containing 10 counters.

In the bag there are

7 red counters
2 blue counters
1 green counter

Caroline is going to choose at random a counter from the bag.

impossible	unlikely	evens	likely	certain

(a) Write down the word from the box that best describes the likelihood that Caroline will take

(i) a red counter,

.....

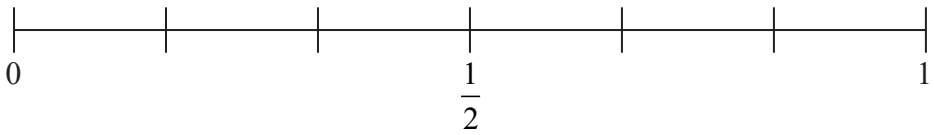
(ii) a yellow counter.

.....

(2)

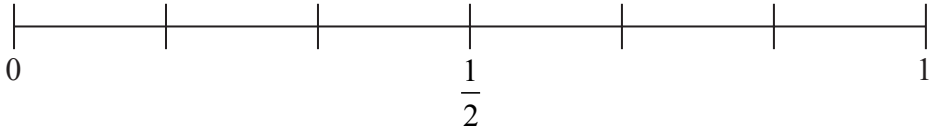
Jamil is going to roll a fair six-sided dice.

(b) On the probability scale, mark with a cross (×) the probability that the dice will land on an odd number.



(1)

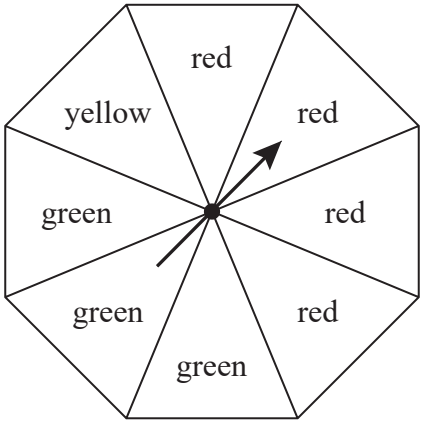
(c) On the probability scale, mark with a cross (×) the probability that the dice will land on 2



(1)

(Total for Question 3 is 4 marks)

4 The diagram shows a fair 8-sided spinner.



Hollie is going to spin the spinner once.

impossible	unlikely	evens	likely	certain

(a) Write down the word from the box above that best describes the likelihood that the spinner will land on

(i) yellow

.....

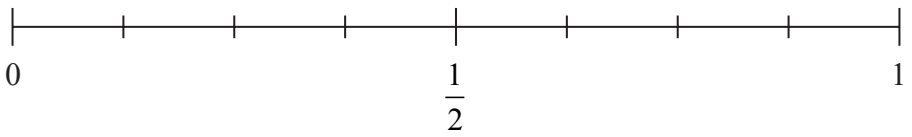
(1)

(ii) red.

.....

(1)

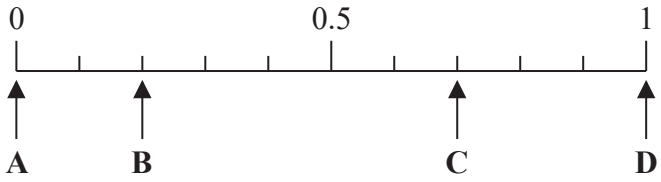
(b) On the probability scale below, mark with a cross (×) the probability that the spinner will land on blue.



(1)

(Total for Question 4 is 3 marks)

5 Here is a probability scale.



In a fruit bowl, there are only

3 bananas
7 pears

Shimon is going to take at random one of the fruits from the bowl.

(a) Write down the letter of the arrow that points to the probability that Shimon takes

(i) a pear,

.....

(1)

(ii) a grape.

.....

(1)

Emma has some carrots, some potatoes and some onions in a bag.
She says that the probability of taking at random a carrot from the bag is 1.4

Emma is not correct.

(b) Explain why.

.....

.....

(1)

(Total for Question 5 is 3 marks)

6 There are 12 beads in a bag.

6 of the beads are green
4 of the beads are blue
2 of the beads are pink

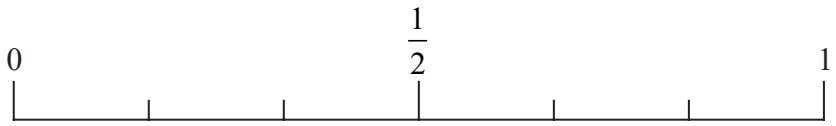
Peter takes at random a bead from the bag.

(a) Circle the word in the list below that best describes the likelihood that the bead is green.

impossible unlikely evens likely certain

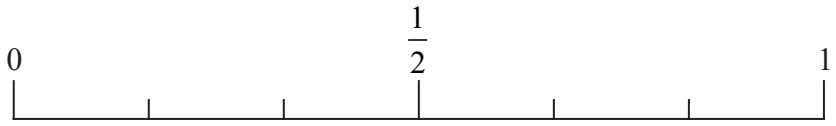
(1)

(b) On the probability scale, mark with a cross (×) the probability that the bead is orange.



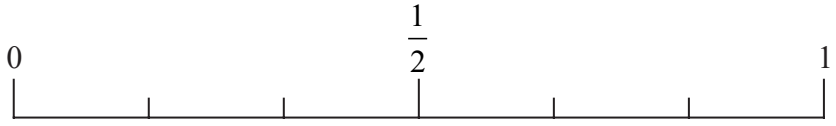
(1)

(c) On the probability scale, mark with a cross (×) the probability that the bead is blue.



(1)

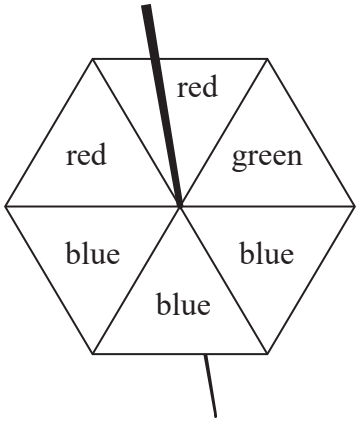
(d) On the probability scale, mark with a cross (×) the probability that the bead is green or pink.



(1)

(Total for Question 6 is 4 marks)

7 The diagram shows a fair 6-sided spinner.



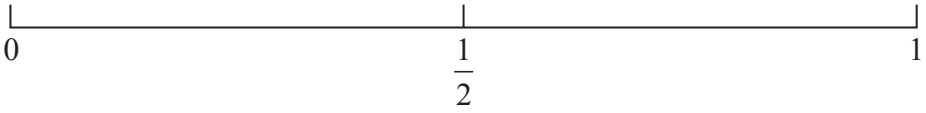
Rami is going to spin the spinner once.

(a) Circle the word in the box below that best describes the likelihood that the spinner will land on green.

impossible	unlikely	evens	likely	certain

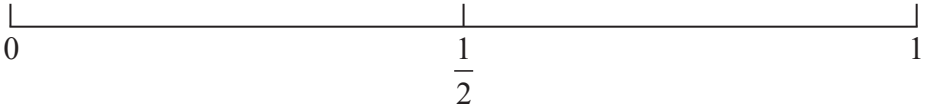
(1)

(b) On the probability scale below, mark with a cross (×) the probability that the spinner will land on blue.



(1)

(c) On the probability scale below, mark with a cross (×) the probability that the spinner will land on yellow.



(1)

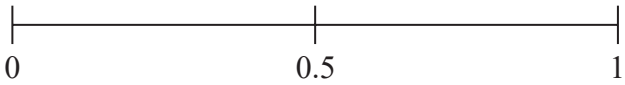
(Total for Question 7 is 3 marks)

8 Adam has 8 packets of noodles.
Here is the flavour of noodles in each packet.

Hot and Spicy	Curry	Vegetarian	Hot and Spicy
Curry	Hot and Spicy	Curry	Hot and Spicy

Adam takes at random a packet of noodles.

(a) (i) On the probability scale, mark with a cross (×) the probability that Adam takes a packet of Hot and Spicy noodles.



(1)

(ii) Circle the word that best describes the likelihood that Adam takes a packet of Vegetarian noodles.

impossible	unlikely	even	likely	certain

(1)

Belinda asks 20 people to name the type of rice that they each like the best.

Here are her results.

arborio	jasmine	basmati	jasmine	basmati
basmati	arborio	wild	jasmine	jasmine
jasmine	jasmine	arborio	basmati	basmati
wild	basmati	jasmine	wild	arborio

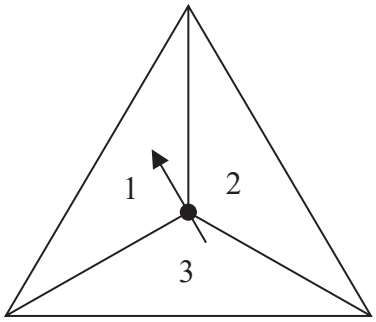
(b) Complete the frequency table for Belinda's results.

Type of rice	Tally	Frequency
arborio		
basmati		
jasmine		
wild		

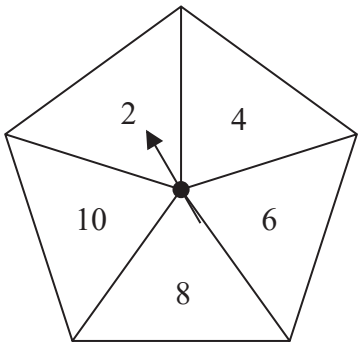
(2)

(Total for Question 8 is 4 marks)

9 Jian has two fair spinners.
Spinner **A** is 3-sided and can land on 1, 2 or 3
Spinner **B** is 5-sided and can land on 2, 4, 6, 8 or 10



Spinner **A**



Spinner **B**

Jian spins each spinner once.

He adds together the number that spinner **A** lands on and the number that spinner **B** lands on to get his total score.

(a) Complete the table to show all possible total scores.
Five of the total scores have been done for you.

Spinner **A**

Spinner **B**		**1**	**2**	**3**
	2	3		
	4			7
	6	7		
	8		10	
	10		12	

(2)

(b) Find the probability that

(i) Jian's total score is an odd number

.....

(1)

(ii) Jian's total score is less than 9

.....

(1)

(Total for Question 9 is 4 marks)

10 Mohsen is going to a party.
He will choose at random one shirt from the three shirts and one pair of trousers from the three pairs of trousers in the list below.

Shirts	**Trousers**
Blue (B)	Green (G)
Red (R)	Orange (O)
Yellow (Y)	Purple (P)

(a) Write down all the possible combinations that Mohsen can choose.

.....

.....

.....

(2)

(b) Find the probability that Mohsen chooses the red shirt to wear to the party.

.....

(1)

There are 20 counters in a bag.

4 of the counters are pink.
9 of the counters are white.
The rest of the counters are black.

Jean takes at random one counter from the bag.

(c) Work out the probability that Jean takes a black counter.

.....

(2)

(Total for Question 10 is 5 marks)

11 There are 150 people at an international conference.
These 150 people were each asked to say what their main method of transport was to get to the conference.
The two-way table shows some information about these people and their answers.

	bus	**train**	**plane**	**total**
men		15		80
women	17			
total	29	43		150

(a) Complete the two-way table.

(3)

One of the men from these 150 people is selected at random.

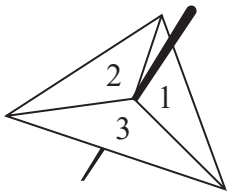
(b) Write down the probability that this man's main method of transport was train.

.....

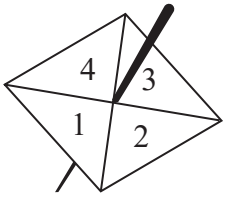
(1)

(Total for Question 11 is 4 marks)

12 Avner has two fair spinners.



Spinner A



Spinner B

Spinner **A** can land on 1, 2 or 3
Spinner **B** can land on 1, 2, 3 or 4

Avner **multiplies** the number on which spinner **A** lands by the number on which spinner **B** lands to find his score.

(a) Complete the table to show all possible scores.
Seven of the scores have been completed for you.

		Spinner A		
		1	**2**	**3**
Spinner B	**1**	1	2	3
	2	2	4	
	3	3		
	4	4		

(2)

Avner spins spinner **A** once and spinner **B** once.

(b) Find the probability that his score is an odd number.

.....

(1)

(Total for Question 12 is 3 marks)

13 Anjali wants to go on a boat at the seaside.

At the seaside there are 20 boats.

Of these boats
- 2 are white
- 5 are blue
- 7 are green
- 6 are yellow

Anjali selects at random one of these boats.

Write down the probability that she selects

(i) a green boat,

.....

(1)

(ii) a white boat or a yellow boat.

.....

(2)

(Total for Question 13 is 3 marks)

14 All the teachers at a school are either left footed or right footed.
At the school

the number of left footed teachers : the number of right footed teachers = 3 : 13

A teacher at the school is picked at random.

(a) Find the probability that this teacher is left footed.

(1)

At the school, there are 18 left footed teachers.

(b) How many right footed teachers are there?

(2)

(Total for Question 14 is 3 marks)

15 The table gives information about the number of gold stars won by each of 25 students in class 7T last week.

Number of gold stars	Number of students
0	6
1	5
2	4
3	7
4	3

(a) Work out the mean number of gold stars won.

.....

(3)

A student in class 8R is to be chosen at random.

The probability that this student won at least one gold star last week is 0.39

(b) Work out the probability that this student did **not** win at least one gold star last week.

.....

(1)

(Total for Question 15 is 4 marks)

16 There are 20 counters in bag **X**.

7 of the counters are green.
10 of the counters are red.
The rest of the counters are blue.

Ruth takes at random a counter from bag **X**.

(a) Write down the probability that the counter is red.

.....

(1)

(b) Work out the probability that the counter is blue.

.....

(1)

Ruth puts the counter back into bag **X**.

Bag **Y** only contains green counters, red counters and blue counters.

In bag **Y** there are,

2 more green counters than in bag **X**
1 more red counter than in bag **X**
2 more blue counters than in bag **X**

Adam takes at random a counter from bag **Y**.
Ruth takes at random a counter from bag **X**.

(c) Who has the greater probability of taking a green counter, Adam or Ruth?
Show your working clearly.

(3)

(Total for Question 16 is 5 marks)

17 A bag of 11 counters contains

3 purple counters
2 orange counters
6 white counters

A counter is going to be taken at random from the bag.

(a) Find the probability that the counter will be

(i) orange

.....

(ii) not white

.....

(iii) green

.....

(3)

A box of 12 toy cars contains

3 red cars
4 blue cars
5 yellow cars

Some extra **red** cars are put in the box.
When a car is taken at random from the box, the probability that the car is yellow is $\frac{1}{6}$

(b) Work out the number of extra red cars that are put in the box.

.....

(2)

(Total for Question 17 is 5 marks)

18 Mario is going to play two games on Saturday.
He will play one game on Saturday morning and one game on Saturday afternoon.

The following table shows the games from which he is going to choose.

Morning	Afternoon
Bridge (B) Chess (C) Draughts (D)	Ludo (L) Mahjong (M) Snakes and ladders (S)

(a) Write down all the possible combinations of games that Mario can play on Saturday.

.....

.....

.....

(2)

Mario asked 100 students in his school to name their favourite card game.

His results are shown in the two-way table below.

	Solitaire	Rummy	Whist	Total
Year 10	30	19	4	53
Year 11	17	18	12	47
Total	47	37	16	100

One of the students Mario asked is picked at random.

(b) Write down the probability that this student is in Year 11

.....

(1)

One of the Year 10 students is picked at random.

(c) Work out the probability that this student did **not** answer Whist.

.....

(2)

(Total for Question 18 is 5 marks)

19 A bag contains 30 coloured counters.
The table gives the number of counters of each colour.

Colour	**Red**	**Green**	**Yellow**	**Blue**
Number of counters	7	13	4	6

One of the counters is taken at random from the bag.

(a) Write down the probability that this counter is green.

.....

(1)

(b) Write down the probability that this counter is **not** red.

.....

(2)

(Total for Question 19 is 3 marks)

20 There are 20 beads in a box.

7 of the beads are red.
11 of the beads are green.
The rest of the beads are yellow.

Jan takes at random a bead from the box.

(a) Write down the probability that she takes a red bead.

(1)

(b) Find the probability that she takes a red bead or a yellow bead.

(2)

There are 26 counters in a bag.

5 of the counters are pink.
10 of the counters are blue.
The rest of the counters are white.

Jan puts some more pink counters into the bag.
She then takes some blue counters out of the bag.
After she has done this there are still 26 counters in the bag.

Jan then takes at random a counter from the bag.

The probability that she takes a pink counter is $\frac{1}{2}$

(c) What is the probability that she takes a blue counter?

(3)

(Total for Question 20 is 6 marks)

21 Each time John plays a game, the probability that he wins the game is 0.65

John is going to play the game 300 times.

Work out an estimate for the number of games that John wins.

.....

(Total for Question 21 is 2 marks)

22 There are some counters in a bag.

7 of the counters are blue.
5 of the counters are green.
The rest of the counters are yellow.

One counter is going to be taken at random from the bag.

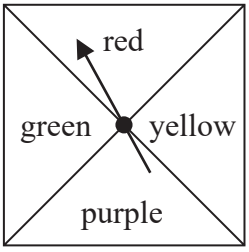
The probability that the counter is blue or is green is $\frac{6}{13}$

Work out how many yellow counters there are in the bag.

.....

(Total for Question 22 is 3 marks)

23 Here is a biased spinner.



When the spinner is spun once, the probabilities that it lands on red or on yellow or on green are given in the table.

Colour	red	yellow	purple	green
Probability	0.25	0.2		0.2

(a) Work out the probability that the spinner lands on red or on yellow.

.....

(1)

Yang is going to spin the spinner 300 times.

(b) Work out an estimate for the number of times the spinner will land on purple.

.....

(3)

(Total for Question 23 is 4 marks)

24 Toy cars are made in a factory.
The toy cars are made for 15 hours each day.
5 toy cars are made every 12 seconds.

For the toy cars made each day, the probability of a toy car being faulty is 0.002

Work out an estimate of the number of faulty toy cars that are made each day.

.....

(Total for Question 24 is 4 marks)

25 A tin contains tea bags with a choice of four different flavours of tea.
The four flavours of tea are Assam or Darjeeling or Nilgiri or Rize.

Sara takes at random a tea bag from the tin.

The table shows each of the probabilities that the flavour of the tea Sara takes is Assam or Darjeeling or Rize.

Flavour of tea	Assam	Darjeeling	Nilgiri	Rize
Probability	0.38	0.24		0.16

(a) Work out the probability that the flavour of the tea Sara takes is Nilgiri.

.....

(2)

(b) Work out the probability that the flavour of the tea Sara takes is either Darjeeling or Rize.

.....

(2)

(Total for Question 25 is 4 marks)

26 Some members of a library were asked to name the type of book that they each liked to read the best.

One of the members is chosen at random.
The table shows information about the probability of the type of book that this member answered.

Type of book	comedy	romance	mystery	thriller
Probability	0.24	0.40	$3x$	x

48 members answered comedy books.

Work out how many of the members answered mystery books.

.....

(Total for Question 26 is 4 marks)

27 In a bag, there are only red counters, blue counters, green counters and yellow counters.

The total number of counters in the bag is 80

In the bag

the number of red counters is $x + 7$
the number of blue counters is $x - 11$
the number of green counters is $3x$

Jude takes at random a counter from the bag.

The probability that he takes a red counter is $\frac{1}{4}$

Work out the probability that Jude takes a yellow counter.

.....

(Total for Question 27 is 4 marks)