S083 Probability

Q1.

A scout group has a raffle to raise money for charity.
There is 1 prize to be won in the raffle.

Laura buys 12 raffle tickets.
A total of 350 raffle tickets are sold.

Find the probability that Laura does **not** win the prize.

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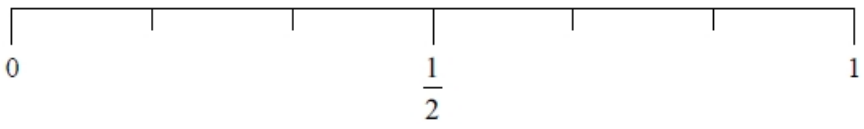
(Total for question = 2 marks)

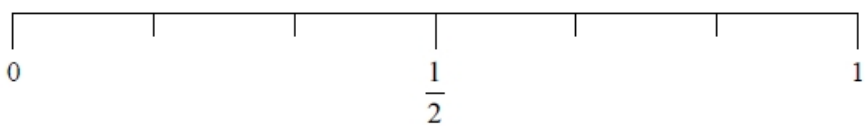
Q2.

Greg rolls a fair ordinary dice once.

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



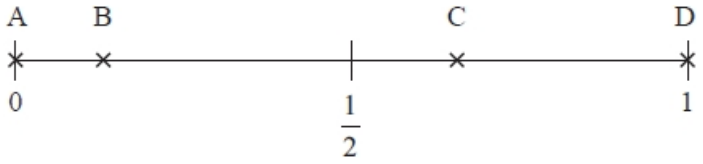
(ii) On the probability scale, mark with a cross (×) the probability that the dice will land on a number less than 5



(Total for question = 2 marks)

Q3.

Here is a probability scale.
It shows the probability of each of the events A, B, C and D.



(a) Write down the letter of the event that is certain.

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(1)

(b) Write down the letter of the event that is unlikely.

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(1)

There are 12 counters in a bag.

3 of the counters are red.
1 of the counters is blue.
2 of the counters are yellow.
The rest of the counters are green.

Caitlin takes at random a counter from the bag.

(c) Show that the probability that this counter is yellow or green is $\frac{2}{3}$.

(3)

(Total for question = 5 marks)

Q4.

There are only blue cubes, red cubes and yellow cubes in a box.
The table shows the probability of taking at random a blue cube from the box.

Colour	blue	red	yellow
Probability	0.2		

The number of red cubes in the box is the same as the number of yellow cubes in the box.
(a) Complete the table.

(2)

There are 12 blue cubes in the box.
(b) Work out the total number of cubes in the box.

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(2)

(Total for question = 4 marks)

Q5.

The table shows the probabilities that a biased dice will land on 2, on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability		0.17	0.18	0.09	0.15	0.1

Neymar rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 1 or on 3

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(Total for question = 3 marks)

Q6.

In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	red	blue	green	yellow
Probability	0.4	.....	.....	0.25

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

(Total for question = 4 marks)

Q7.

Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.33
B	0.033
C	$\frac{1}{3}$
D	30%

(a) (i) Which coin is least likely to land on Heads?

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(1)

(ii) Which coin is most likely to land on Heads?

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(1)

Julie says,

"The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails."

(b) Is she correct?
Give a reason for your answer.

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(1)

Coin B is going to be thrown 4000 times.

(c) Work out an estimate for the number of times coin B will land on Heads.

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(2)

(Total for question = 5 marks)

Q8.

There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

Colour	red	white	blue	yellow
Probability			0.45	0.25

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

(a) Work out the number of red counters in the bag.

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(4)

A marble is going to be taken at random from a box of marbles.
The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(b) Explain why.

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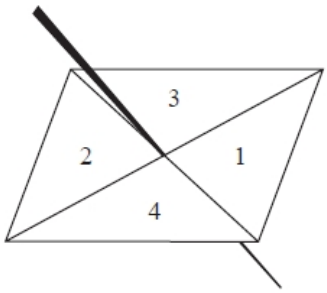
(1)

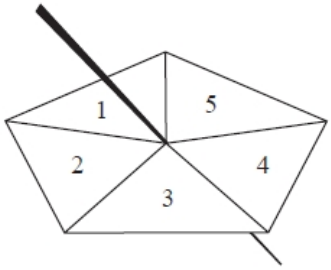
(Total for question = 5 marks)

Q9.

Here are a 4–sided spinner and a 5–sided spinner.

The spinners are fair.





Jeff is going to spin each spinner once.
Each spinner will land on a number.
Jeff will get his score by adding these two numbers together.

(a) Complete the possibility space diagram for each possible score.

4-sided spinner \ 5-sided spinner	**1**	**2**	**3**	**4**	**5**
1	2	3	4	5	6
2	3				
3	4				
4	5				

(1)

Jeff spins each spinner once.

(b) Find the probability that Jeff gets

(i) a score of 3

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(ii) a score of 5 or more.

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(2)

(Total for question = 3 marks)

Q10.

When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom
point down	31	53	16
point up	14	27	9

Rachael is going to drop the drawing pin once.

(a) Whose results will give the best estimate for the probability that the drawing pin will land point up?

Give a reason for your answer.

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(1)

Stuart is going to drop the drawing pin twice.

(b) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

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(2)

(Total for question = 3 marks)

Q11.

Four friends each throw a biased coin a number of times.
The table shows the number of heads and the number of tails each friend got.

	Ben	Helen	Paul	Sharif
heads	34	66	80	120
tails	8	12	40	40

The coin is to be thrown one more time.

(a) Which of the four friends' results will give the best estimate for the probability that the coin will land heads?
Justify your answer.

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(1)

Paul says,

"With this coin you are twice as likely to get heads as to get tails."

(b) Is Paul correct?
Justify your answer.

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(2)

The coin is to be thrown twice.

(c) Use all the results in the table to work out an estimate for the probability that the coin will land heads both times.

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(2)

(Total for question is 5 marks)

Q12.

Stuart throws a biased coin 10 times.
He gets 7 Tails.

Maxine throws the same coin 50 times.
She gets 30 Tails.

Prasha is going to throw the coin once.

(i) Whose results will give the better estimate for the probability that she will get Tails, Stuart's or Maxine's?
You must give a reason for your answer.

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(1)

(ii) Use Stuart's and Maxine's results to work out an estimate for the probability that Prasha will get Tails.

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(1)

(Total for question = 2 marks)

Q13.

There are only red counters, blue counters and purple counters in a bag.
The ratio of the number of red counters to the number of blue counters is 3 : 17

Sam takes at random a counter from the bag.
The probability that the counter is purple is 0.2

Work out the probability that Sam takes a red counter.

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(Total for question = 3 marks)

Q14.

There are 300 seeds in a packet of flower seeds.
Each seed will grow into a white flower or a yellow flower or a red flower.

The probability of a seed growing into a white flower is 0.62
45 of the seeds are expected to grow into yellow flowers.

One of the seeds is chosen at random from the packet.

What is the probability that this seed will grow into a red flower?

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(Total for question = 3 marks)

Q15.

When a biased coin is thrown 4 times, the probability of getting 4 heads is $\frac{16}{81}$

Work out the probability of getting 4 tails when the coin is thrown 4 times.

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(Total for question = 2 marks)