

**1** There are 9 counters in a bag.

7 of the counters are green.

2 of the counters are blue.

Ria takes at random two counters from the bag.

Work out the probability that Ria takes one counter of each colour.

You must show your working.

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(Total for Question is 4 marks)

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

<b>Number on dice</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Probability</b>		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 is 3 marks)

- 3 There are only blue cubes, yellow cubes and green cubes in a bag.

There are

twice as many blue cubes as yellow cubes  
and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

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(Total for Question is 3 marks)

- 4 There are 12 counters in a bag.  
There is an equal number of red counters, blue counters and yellow counters in the bag.  
There are no other counters in the bag.
- 3 counters are taken at random from the bag.
- (a) Work out the probability of taking 3 red counters.

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(2)

The 3 counters are put back into the bag.

Some more counters are now put into the bag.

There is still an equal number of red counters, blue counters and yellow counters in the bag.

There are no counters of any other colour in the bag.

3 counters are taken at random from the bag.

- (b) Is it now less likely or equally likely or more likely that the 3 counters will be red?  
You must show how you get your answer.

(2)

**(Total for Question is 4 marks)**

- 5 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 is 3 marks)**

- 6 There are only blue counters, yellow counters, green counters and red counters in a bag. A counter is taken at random from the bag.

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

<b>Colour</b>	blue	yellow	green	red
<b>Probability</b>	0.2	0.35	0.4	

- (a) Work out the probability of getting a red counter.

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(1)

- (b) What is the least possible number of counters in the bag?  
You must give a reason for your answer.

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.....  
(2)

**(Total for Question is 3 marks)**

- 7 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 is 3 marks)

- 8 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.

<b>Colour</b>	red	white	blue	yellow
<b>Probability</b>			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 is 5 marks)**



- 9 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.

<b>Colour</b>	blue	red	yellow
<b>Probability</b>	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 is 4 marks)**

10 Hannah is planning a day trip for 195 students.

She asks a sample of 30 students where they want to go.  
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	10
Theatre	5
Sports Centre	8
Seaside	7

(i) Work out how many of the 195 students you think will want to go to the Theme Park.

.....  
(2)

(ii) State any assumption you made **and** explain how this may affect your answer.

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.....  
.....  
(1)

(Total for Question is 3 marks)

- 11 There are  $p$  counters in a bag.  
12 of the counters are yellow.

Shafiq takes at random 30 counters from the bag.  
5 of these 30 counters are yellow.

Work out an estimate for the value of  $p$ .

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(Total for Question is 2 marks)

- 12 Marek has 9 cards.  
There is a number on each card.



Marek takes at random two of the cards.  
He works out the product of the numbers on the two cards.

Work out the probability that the product is an even number.

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(Total for Question is 3 marks)

- 13 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 is 2 marks)

- 14 Sally plays two games against Martin.  
In each game, Sally could win, draw or lose.  
In each game they play,  
the probability that Sally will win against Martin is 0.3  
the probability that Sally will draw against Martin is 0.1

Work out the probability that Sally will win **exactly** one of the two games against Martin.

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(Total for Question is 3 marks)

**15** There are only 3 red counters and 5 yellow counters in a bag.

Jude takes at random 3 counters from the bag.

Work out the probability that he takes exactly one red counter.

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(Total for Question is 4 marks)

16 In a village,

if it rains on one day, the probability that it will rain on the next day is 0.8

if it does **not** rain on one day, the probability that it will rain on the next day is 0.6

A weather forecaster says,

“There is a 70% chance that it will rain in the village on Monday.”

Work out an estimate for the probability that it will rain in the village on Wednesday.

You must show all your working.

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(Total for Question is 4 marks)

- 17 In a bag there are only red counters, blue counters, green counters and pink counters. A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

<b>Colour</b>	red	blue	green	pink
<b>Probability</b>	0.05	0.15	.....	.....

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

- (a) Complete the table.

(2)

There are 18 blue counters in the bag.

- (b) Work out the total number of counters in the bag.

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(2)

**(Total for Question is 4 marks)**

**18** Pat throws a fair coin  $n$  times.

Find an expression, in terms of  $n$ , for the probability that Pat gets at least 1 head and at least 1 tail.

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(Total for Question is 2 marks)