Probability 1 (H & F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

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Total Marks:	

1. A coin is rolled onto a grid of squares.

   It lands randomly on the grid.

   To win, the coin must land completely within one of the squares.

   Meera and John each roll the coin a number of times and record their results.

	Number of wins	Number of losses
Meera	6	44
John	28	72

(a) Work out two different estimates for the probability of winning.

Answer 6/50 and 28/100 [2]

(b) Which of your estimates is the better estimate for the probability of winning?

Give a reason for your answer.

Answer: 28/100

Reason: There were a greater number of trials carried out.

[1]

2. Abi, Ben and Carl each drop a number of identical drawing pins, and count how many land with the pin upwards. The table shows some of their results.

	Number of pins dropped	Number landing 'pin up'
Abi	10	4
Ben	30	9
Carl	100	35

(a) Abi says

As a drawing pin can only land with its pin up or with its pin down, the probability of a drawing pin landing 'pin up' is ½

Criticise her statement.

Probability of ½ is for equally likely events. The results show landing pin up or down are not equally likely. [1]

(b) Carl's results give the best estimate of the probability of a drawing pin landing 'pin up'.

Explain why.

He has repeated the experiment a greater number of times. [1]

(c) Two pins are dropped.

Estimate the probability that both pins land 'pin up'.

Using all results:

$\frac{48}{140} \times \frac{48}{140} = \frac{2304}{19600} =$ 0·12 (2dp)

Could also use Carl's results.

(c) ..... [2]

3. There are only red counters, blue counters, green counters and yellow counters in a bag.

The table shows the probabilities of picking at random a red counter and picking a random a yellow counter.

Colour	red	blue	green	yellow
Probability	0.24	0·22	0·22	0.32

The probability of picking a blue counter is the same as the probability of picking a green counter.

0·24 1-0·56-0·44
0·32 0·44 - 0·22
0·56 2

Complete the table.

[2]

4. Here is an ordinary dice.

(a) Ali is going to throw the dice six times.

He says, *"I will get one of each number."*

Give a reason why he could be wrong.

He hasn't rolled the dice enough times for the results to be very close to the theoretical probability.

[1]

(b) Lucy throws the dice 50 times.

Her results are shown.

Number thrown	1	2	3	4	5	6
Frequency	7	4	12	5	9	13

Work out the relative frequency of throwing an odd number.

28/50 (= 14/25)

[2]

5. Bag A contains 10 blue balls and 20 red balls.

Bag B contains 8 blue balls and 12 red balls.

A ball is chosen at random from each bag.

Jo says,

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

Is she correct? You must show your working.

Bag A: P(blue) = 10/30 = 1/3
Bag B: P(blue) = 8/20 = 2/5
1/3 = 33.3%. 2/5 = 40%.

She is wrong as the probability of choosing a blue ball is greater for bag B, as 2/5 > 1/3.

[3]

6. A doctor claims that the probability of having regular illness is doubled if you have poor sleep rather than good sleep.

In a survey, 16% of people with poor sleep had regular illness.

Here are the results for people with good sleep.

Good Sleep

	Number of people
Regular illness	24
Not regular illness	276

Comment on the doctor's claim. You must show your working.

Good sleep: $\frac{24}{300} = \frac{8}{100} = 8\%$

The doctors claim is correct from these results as probability of regular illness for good sleepers is 8% but for bad sleep is 16%.

[3]

7. John chooses a number at random from the digits 1 to 4

Matt also chooses a number at random from the digits 1 to 4

a) Write down the probability that the sum of the two numbers chosen is a two-digit number.

0

[1]

b) Work out the probability that the product of the two numbers chosen is a two-digit number.

	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16

$\frac{3}{16}$.

[3]

CREDITS AND NOTES

Question	Awarding Body	Question	Awarding Body
1	AQA	5	AQA
2	OCR	6	AQA
3	Pearson Edexcel	7	AQA
4	AQA		

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material