

Number Problems (H)

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

Name:	mel@justmaths.co.uk
Total Marks:	

1. Ann picks a 4-digit number.

The first digit is not zero.

The 4-digit number is a multiple of 5

How many different 4-digit numbers could she pick?

9 ways 10 ways 10 ways 2 ways

$$9 \times 10 \times 10 \times 2$$

$$9 \times 2 \times 10 \times 10$$

$$18 \times 100 = 1800 \text{ ways}$$

[3]

2. Tick whether each statement is true or false.

Give a reason for your answer.

a) When $x^2 = 16$ the only value that x can be is 4

True

☐

False

☒

[1]

Reason it could also be -4

b) When n is a positive integer, the value of $2n$ is always a factor of the value of $20n$.

True

☒

False

☐

[1]

Reason $\frac{20n}{2n} = 10$

c) When y is positive, the value of y^2 is always greater than the value of y .

True ☐ False ☒

[1]

Reason if y is between 0 and 1. i.e. $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$
which is smaller than $\frac{1}{2}$

3. Becky has some marbles.

Chris has two times as many marbles as Becky.

Dan has seven more marbles than Chris.

They have a total of 57 marbles.

Dan says:

"If I give some marbles to Becky, each of us will have the same number of marbles."

Is Dan correct?

You must show how you get your answer.

$$57 \div 3 = 19$$

B	C	D
x	$2x$	$2x+7$
$5x+7 = 57$		
$5x = 50$		
$x = 10$		

B C D
10 20 27

For them to have the same amount Chris would have to give her 1 marble too. [3]

4. Tomas ran a Lucky Dip stall.

ending in 5
5
15
25
35
45
55
65
75
85
95
= 10 per 100
5 per 50
 75×1.50
112.50

★ **LUCKY DIP** ★

Tickets 50p

Tickets ending 00 win £12

Tickets ending 5 win £1.50

winning tickets
100
200
300
400
500
600
700
 $7 \times 12 = 84$

There were 750 tickets, numbered 1 to 750

Tomas sold all the winning tickets, and some of the losing tickets.

He made a profit of £163 $+ 112.50 + 84 = 359.50$
 $359.50 \div 0.5 = 719$ tickets

How many losing tickets did he sell?

$$719 - (75 + 7) = 637$$

[6]

5. Jack works out the answer to $\frac{\sqrt{98.5} - 12.1}{-0.8}$

He says the answer is negative.

Is he correct?

You must show your working.

$$\frac{\sqrt{100} - 12}{-0.8}$$

$$\frac{10 - 12}{-0.8} = \frac{-2}{-0.8}$$

he is incorrect $- \div -$ will be positive

[2]

6. w, x and y are three integers.

w is 2 less than x

y is 2 more than x

Prove that $wy + 4 = x^2$

[3]

$$\begin{array}{ccc} w & x & y \\ x - 2 & x & x + 2 \end{array}$$

LHS

$$\begin{aligned} & (x - 2)(x + 2) + 4 \\ & x^2 + 2x - 2x - 4 + 4 \\ & = x^2 \end{aligned}$$

$$\therefore LHS = RHS.$$

CREDITS AND NOTES

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