

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 |
| Total Marks: | |

1. Ann picks a 4-digit number.

The first digit is not zero. ✓

9 10 10 0,5 4 options

The 4-digit number is a multiple of 5

How many different 4-digit numbers could she pick?

$$9 \times 10 \times 10 \times 2 = 1800$$

[3]

2. Tick whether each statement is true or false.

Give a reason for your answer.

$$x^2 = \pm \sqrt{16} = \pm 4$$

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

True

☐

False

☒

[1]

Reason

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

$$n = 2 \quad 2n = 4 \\ 20n = 40 \checkmark$$

True

☒

False

☐

$$n = 5 \quad 2n = 10 \\ 20n = 100 \checkmark$$

$$2n(10)$$

[1]

Reason

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

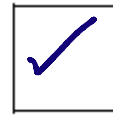
$$0.5 \times 0.5 = 0.25$$

$$0.25 < 0.5$$

True



False



[1]

Reason

if y is a value > 0 but < 1 y^2 will be $< y$

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. $57 \div 3 = \underline{\underline{29}}$

Dan says:

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

Is Dan correct?

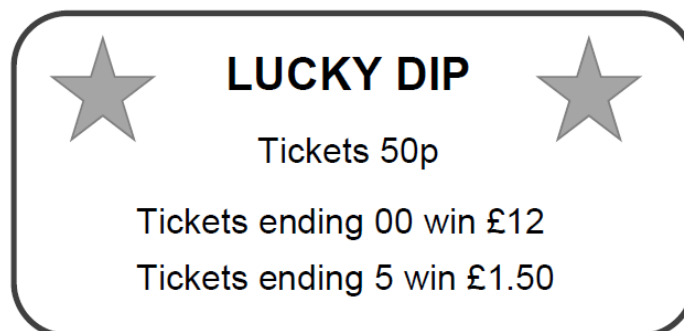
You must show how you get your answer.

$$\begin{array}{lcl} B = x & 10 & 5x + 7 = 57 \\ C = 2x & 20 & x = 10 \\ D = 2x + 7 & 27 & \end{array}$$

No he is wrong, Chris would also have to give her some marbles

[3]

4. Tomas ran a Lucky Dip stall.



$$\begin{array}{l} 100 \\ 200 \\ 300 \\ \vdots \\ 700 \end{array} = 7 \times 12 = \pounds 84$$

$$\begin{array}{l} 5 \\ 15 \\ 25 \\ \vdots \\ 75 \end{array} = 10 \times 7 + 5 = 75$$

$$75 \times 1.50 = 112.50$$

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

719 total sold less 7 'winners' = 712


How many losing tickets did he sell?

$$\begin{array}{r} \text{Costs} = 84 \\ 112.50 \\ \hline 196.50 \end{array}$$

$$\begin{array}{r} 196.50 \\ 163.00 \\ \hline 359.50 \end{array}$$

$$359.50 \div 0.5 = 719 \text{ tickets}$$

$$\begin{array}{r} 359.5 \\ 359.5 \\ \hline 7190 \end{array}$$

[6]

5. Jack works out the answer to $\frac{\sqrt{98.5} - 12.1}{-0.8} \approx \frac{10 - 12}{-1} = \frac{-2}{-1} = +2$

He says the answer is negative.

Is he correct?

No Jack is incorrect.

You must show your working.

[2]

6. w, x and y are three integers.

w is 2 less than x $w = x - 2$

y is 2 more than x $y = x + 2$

Prove that $wy + 4 = x^2$

RHS $wy = (x - 2)(x + 2) = x^2 - 4$

$$wy + 4 = x^2 - 4 + 4 = x^2$$

$$\therefore \text{RHS} = x^2 \text{ QED}$$

[3]

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