

# Substitution/Solving/Rearranging Equations (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. Kelly is trying to work out the two values of  $w$  for which  $3w - w^3 = 2$

Her values are 1 and -1

Are her values correct?

You must show your working.

If  $w = 1$ ,  $3 \times 1 - (1) = 2$

If  $w = -1$ ,  $3 \times (-1) - (-1) = -3 + 1 = -2$

**Therefore, only one of her values is correct**

[2]

2. Solve.

$$3x^2 = 75$$

$$x^2 = 25$$

$$x = \sqrt{25}$$

$$x = 5 \text{ or } -5$$

x = ..... [2]

3. Make  $t$  the subject of the formula  $w = 3t + 11$

$$w - 11 = 3t$$

$$t = \frac{w - 11}{3}$$

3

[2]

4. Make  $t$  the subject of the formula  $y = \frac{t}{3} - 2a$

$$y + 2a = \frac{t}{3}$$

3

$$t = 3(y + 2a)$$

..... [2]

5. This formula works out the tax you pay.

$$T = 0.2(E - 10\,600)$$

T is the tax you pay in pounds.

E is the amount you earn in pounds.

Alison pays £5200 tax.

Work out the amount she earns.

$$5200 = 0.2(E - 10600)$$

$$26000 = E - 10600$$

$$E = 36600$$

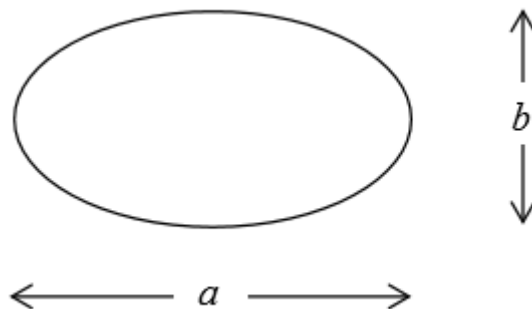
[3]

6. Solve  $x^2 = 30.25$

[2]

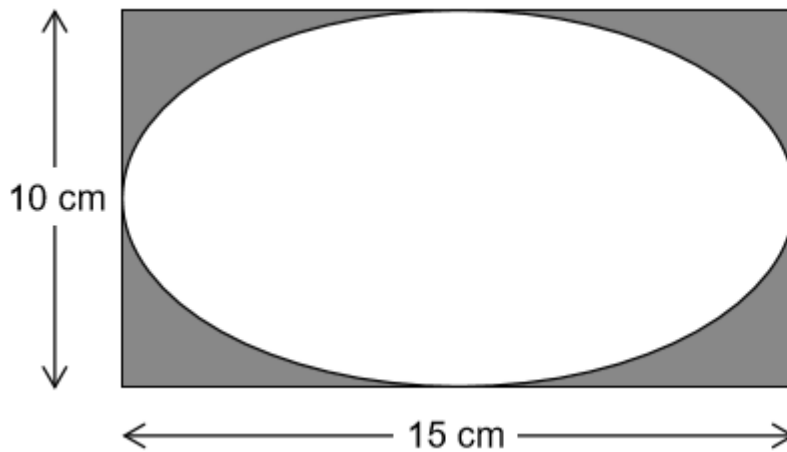
7. The area of an ellipse, width a and height b, is given by

$$\frac{\pi ab}{4}$$



A rectangular photograph measures 15 cm by 10 cm

It is put into a frame as shown.



Not drawn accurately

The part of the photograph that can be seen is an ellipse.

Work out the percentage of the photograph that can be seen.

[3]

$$\frac{\text{Ellipse}}{\text{Rectangle}} \times 100$$

$$\frac{0.25 \times \pi \times 10 \times 15}{10 \times 15} \times 100$$

$$= 78.5\%$$

## CREDITS AND NOTES

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

### 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