



Aberdare Community School  
Mathematics Department

WJEC GCSE

**Higher – Calculator**

Algebra

# Simultaneous equations

Name: .....

Set: .....

Date: .....

Teacher: .....

12. Solve the following simultaneous equations by an algebraic (not graphical) method.  
Show all your working.

$$\begin{aligned}2x + 5y &= 14 \\8x + 3y &= 5\end{aligned}$$

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14. Solve the following simultaneous equations by an algebraic (not graphical) method.

$$5x + 4y = -6$$

$$2x + 6y = 13$$

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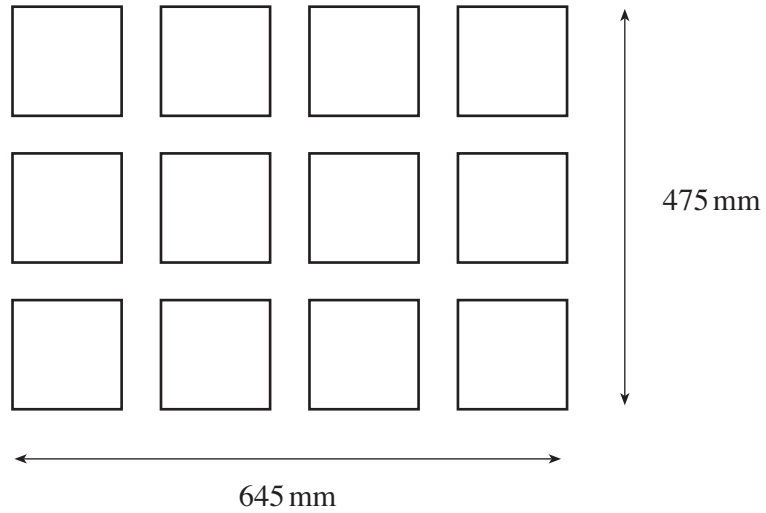
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[4]

13. A rectangular shape is made using 12 square tiles placed with equal gaps between them.  
The overall length of the rectangle is 645 mm and the overall width is 475 mm.



*Diagram not drawn to scale.*

Find the dimensions of the tiles and the width of the gap in mm.

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7.

(b) Solve the following simultaneous equations by an algebraic (not graphical) method. Show **all** your working.

$$\begin{aligned} 2x + y &= 13 \\ 3x - y &= 27 \end{aligned}$$

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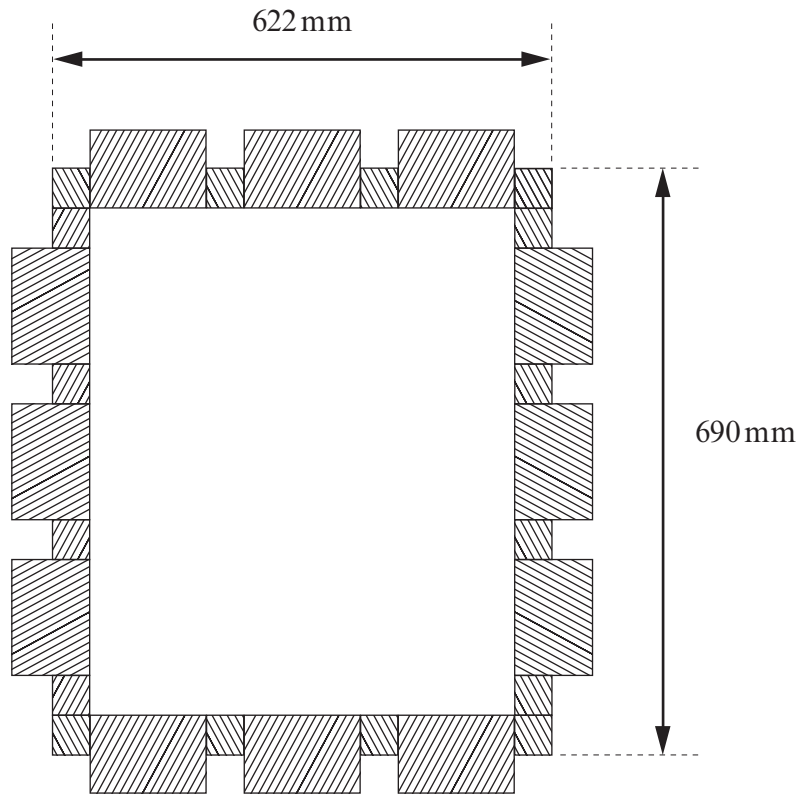
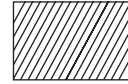
[3]

11. A surround for a mirror is made using

small square tiles



and large rectangular tiles



*Diagram not drawn to scale*

Find the length of the large rectangular tile.

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8.

- (b) Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$$\begin{aligned}7x + 2y &= 2 \\ 2x - 5y &= 34\end{aligned}$$

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8. A shop sells thin edging strips to place around rectangular tiles.  
The cost of edging a tile on display is £10.  
The cost of edging a tile that is three times as long and twice as wide as the tile on display is £27.  
Calculate the cost of the edging along each length and along each width of the tile on display.  
You must use an algebraic method.

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Cost of edging each length £ .....

Cost of edging each width £ .....

[6]

10. (a) Solve the following simultaneous equations using an algebraic method.

$$\begin{aligned}3x + 2y &= 27 \\2x - 5y &= 37\end{aligned}$$

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[4]

Examiner  
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8. David is a scientist.  
As a result of an experiment, he finds connections between two variables  $f$  and  $g$ .  
In order to write the conclusion he needs to find the values of  $f$  and  $g$ .

These are the connections that David finds:

- Twice  $f$  added to three times  $g$  gives a total of 5
- Three times  $f$  added to four times  $g$  gives a total of 4

Form a pair of simultaneous equations and solve them to find the values of  $f$  and  $g$ .

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- (c) Each of the chefs uses their own special soup recipe.  
On a different day, they both buy the same variety of carrots and swede from the same market stall.



Osian buys 2 kg of carrots and 4.5 kg of swede.  
It costs him £3.69 to buy these ingredients.  
Robyn buys 5 kg of carrots and 7.5 kg of swede.  
It costs her £6.90 to buy these ingredients.

Use an algebraic method to calculate the cost of 1 kg of carrots and the cost of 1 kg of swede.

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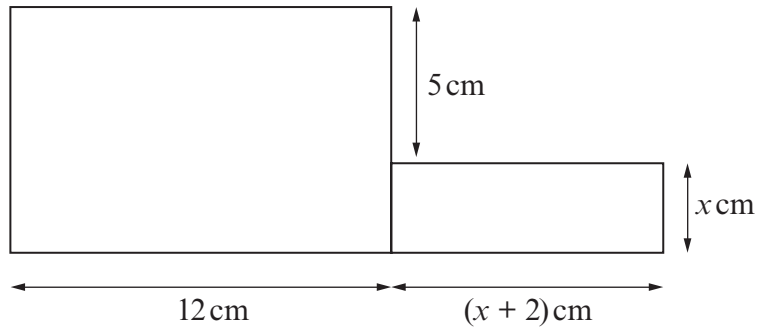
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[6]

16. The diagram below shows a composite shape formed by joining two rectangles.



*Diagram not drawn to scale*

The area of the larger rectangle is  $4y$   $\text{cm}^2$ .  
The area of the smaller rectangle is  $y$   $\text{cm}^2$ .

Form and solve simultaneous equations to calculate the dimensions of the smaller rectangle.  
Give your answers correct to 1 decimal place.

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[8]

13. (a) Solve the simultaneous equations below using an algebraic method.  
Show all your working.

[4]

Examiner  
only

$$\begin{aligned}5x + 2y &= -5 \\4x + 3y &= 3\end{aligned}$$

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8. Evan is an assistant engineer.

(b) Evan is out with his boss taking measurements.  
These measurements lead to a pair of simultaneous equations.

$$\begin{aligned} 3g + 4h &= 8 \\ 5g - 6h &= 7 \end{aligned}$$

Evan is asked by his boss to solve these equations.

Solve the simultaneous equations shown above using an algebraic method. [4]

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6. Levi owns a snack bar.  
All the sandwiches are the same price and all the drinks are the same price.



During the first hour of the day, Levi sells 3 sandwiches and 2 drinks costing £7.20 altogether.  
During the second hour of the day, Levi sells 2 sandwiches and 5 drinks costing £8.10 altogether.

Levi writes down the following simultaneous equations:

$$\begin{aligned} 3x + 2y &= 720 \\ 2x + 5y &= 810. \end{aligned}$$

- (a) What do the  $x$  and  $y$  represent in Levi's equations? [2]

$x$  represents .....

$y$  represents .....

- (b) Solve the simultaneous equations using an algebraic method. [4]

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11. (a) Solve the following simultaneous equations using an algebraic method.

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Examiner  
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$$\begin{aligned}6x + 5y &= 33 \\10x - 3y &= -13\end{aligned}$$

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