Aberdare Community School

Mathematics Department

WJEC GCSE

Higher – Non Calculator

Algebra

Simultaneous equations

Name: ....

Set: ....

Date: ....

Teacher: ....

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

$$7x + 5y = 20$$
$$2x - 3y = 19$$

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[4]

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

$$6x + 5y = 23$$
$$4x + 3y = 18$$

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[4]

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

$$2x + 5y = 4$$
$$3x + 4y = 13$$

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[4]

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

$$3x + 4y = -7$$
$$2x + 6y = -3$$

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[4]

Turn over.

17. Mrs. Jones is buying bottles of still and sparkling water. She buys x bottles of still water and y bottles of sparkling water. Altogether she buys 23 bottles of water.

Still water costs 50p per bottle and sparkling water costs 65p per bottle. Altogether she spends £13.15.

Write down a pair of simultaneous equations and solve them to find out how many bottles of still water and sparkling water Mrs. Jones buys.

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[4]

12.

(c) Solve, using an algebraic method, the following simultaneous equations.

$$x + y = 7$$
$$x + 3y = 1$$

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[3]

11. Sara calculates that five times her age and three times her brother's age gives a total of 100.
The sum of Sara's age and her brother's age is 22.
Find Sara's age and her brother's age.

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[4]

11. Three geese and two ducks weigh 32 kg.
Four geese and three ducks weigh 44 kg.
All the geese weigh the same.
All the ducks weigh the same.
What is the total weight of two geese and one duck?

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[6]

Turn over.

7. *(a)* Three bananas and one apple cost a total of 65p.
Seven bananas and two apples cost a total of £1.49.
How much does one apple cost?

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[4]

8. *(a)* Solve the following simultaneous equations by an algebraic method. Show all your working.

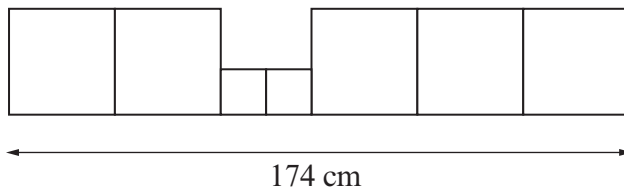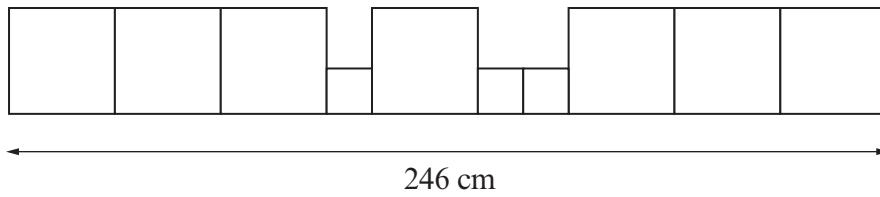$$3x + 4y = 19$$
$$4x + 5y = 23$$

[4]

11. Two sizes of square tiles are used to make these 2 patterns.

246 cm

174 cm

What would be the length of a pattern made using 2 large and 2 small tiles?

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[6]

Turn over.

10. Solve the following simultaneous equations using an algebraic (not graphical) method.

$$3x + 5y = 9$$
$$4x + 3y = 23$$

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[4]

(b)   Solve the following simultaneous equations.

$$5x + 2y = 5$$
$$7x + 3y = 9$$

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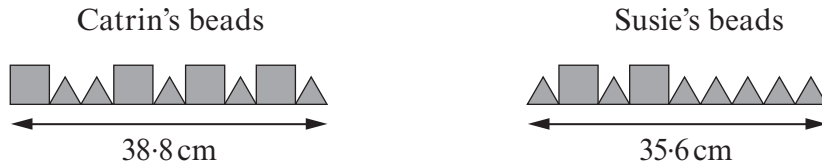..

[4]

8.

Diagram not drawn to scale

Calculate the values of *x* and *y*.

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$x = $ .... ° $y = $ .... °

[6]

7. Catrin and Susie both have necklaces with chunky beads.
They notice that they have the same types of beads, but different numbers of each bead.
The beads are either cubes or square based pyramids.
All the cubes are identical.
All the square based pyramids are identical.

Catrin's necklace   Susie's necklace
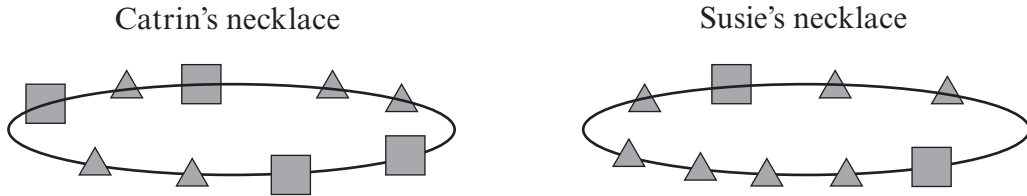
The girls both take the beads off their necklaces and place them in straight lines.

Catrin's beads   Susie's beads

$\xleftarrow{\hspace{1cm}}$ 38·8 cm $\xrightarrow{\hspace{1cm}}$ $\xleftarrow{\hspace{1cm}}$ 35·6 cm $\xrightarrow{\hspace{1cm}}$

Diagrams not drawn to scale

(a) Calculate the length of an edge of the base of a pyramid and the length of an edge of a cube.
You must use an algebraic method.

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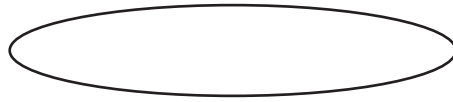
[5]

(b)   Catrin's necklace string is 80 cm long.

How many extra cubic beads can Catrin place on her necklace?

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[2]

11. The diagrams show how 12 small identical rectangles can be placed to form a larger rectangle in two different ways.
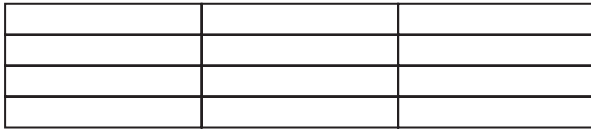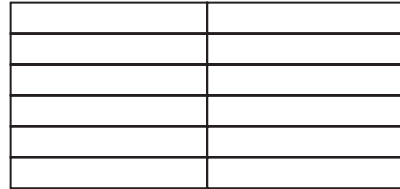
Diagram 1   Diagram 2

Diagrams not drawn to scale

The perimeter of each of these diagrams is measured.
The perimeter of diagram 1 is 55 cm.
The perimeter of diagram 2 is 50 cm.

Find the dimensions of one of the 12 small identical rectangles.

[5]

(4370-05)

Turn over.

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

$$2x + 6y = 7$$
$$5x - 4y = 8$$

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[4]

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11. The Barrett family want to buy new seating for their living room.
Their local Sofa Bargain Centre sells the sofas and armchairs they have chosen.

The price of two large sofas and three armchairs is £2550.
The price of one large sofa and five armchairs is £2500.

How much would two large sofas and one armchair cost?
You must use an algebraic method and you must show all your working. [5]

11. Simon and Syra are on holiday in Devon.
They buy some holiday souvenirs for their friends.
Simon pays £2.05 for 2 key rings and 3 pencils.
Syra pays £3.20 for 3 key rings and 5 pencils.
All the key rings are the same price and all the pencils are the same price.

Find the individual prices of a key ring and a pencil.
You must use an algebraic method. [5]

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Price of a key ring = ...

Price of a pencil = ...

11. Iona and Dafydd went shopping.
They each bought some bottles of the same blackcurrant cordial and the same soda water.
Iona bought 2 bottles of blackcurrant cordial and 3 bottles of soda water.
Dafydd bought 4 bottles of blackcurrant cordial and 1 bottle of soda water.
Iona spent £2.04 and Dafydd spent £2.48.
Use an algebraic method to calculate the cost of a bottle of blackcurrant cordial and the cost of a bottle of soda water. [5]

Cost of a bottle of blackcurrant cordial is ....

Cost of a bottle of soda water is ....

9. The Evans and Smith families go to the cinema.
The Evans family buys two adult tickets and three child tickets for £31.60.
The Smith family buys one adult ticket and two child tickets for £18.60.

Find the cost of an adult ticket and the cost of a child ticket.
You must use an algebraic method. [4]

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9. Solve the following simultaneous equations using an algebraic method.
You must show all your working. [4]

$$6x - 3y = 21$$
$$4x + 5y = 7$$