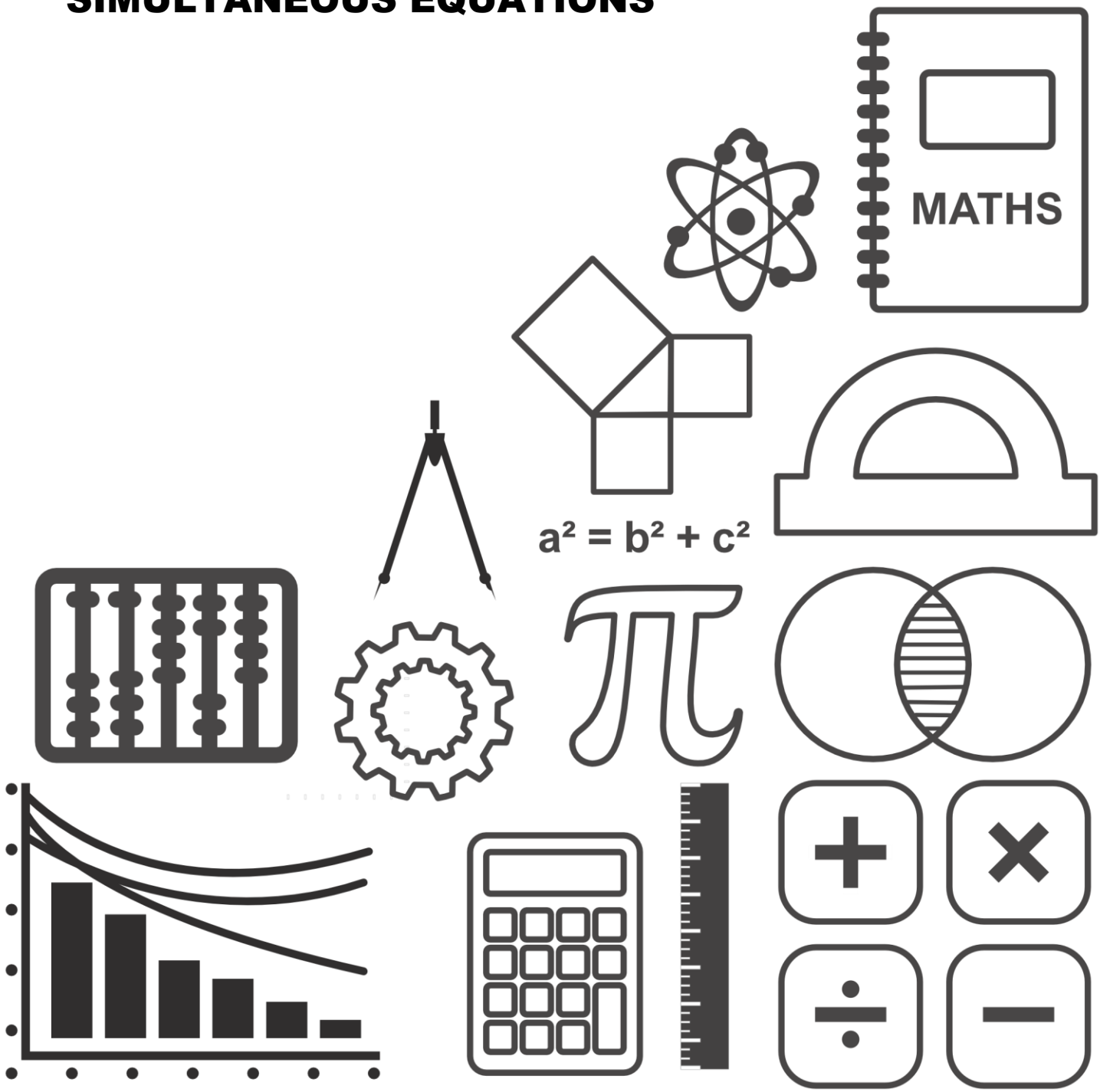
GCSE TOPIC BOOKLET
SIMULTANEOUS EQUATIONS



1. Use an algebraic method to solve the following simultaneous equations. [4]

$$5a + 7b = 63$$
$$10a - 4b = 18$$

2.

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

$$3x + 5y = 6{\cdot}5$$

$$2x - 2y = -9$$

3.

Solve the following simultaneous equations using an algebraic (not graphical) method.
You must show all your working. [4]

$$4x - 3y = 11$$

$$6x - 2y = 9$$

4.

Use an algebraic method to solve the following simultaneous equations. [5]

$3x + 2y = 1$ and $2x = 5(y - 10)$

5. Glyn employs two people, Ben and Ceri.
Ben and Ceri are paid at different hourly rates.

Glyn has recorded how many hours Ben and Ceri have worked on Monday and Tuesday.
He has also recorded the total amount he has paid out in wages.

Day	Number of hours worked		Total pay (£)
	Ben	Ceri	
Monday	6	5	116
Tuesday	4	8	138

Use an algebraic method to calculate how much Ben and Ceri are paid per hour. [6]

Ben is paid £ ..... per hour

Ceri is paid £ ..... per hour

6.

Tomos, Gwen and Jen visit the same fruit stall.
Tomos buys 4 kg of raspberries and 5 kg of blackcurrants for a total cost of £38.
Gwen buys 6 kg of raspberries and 3 kg of blackcurrants for a total cost of £39.
Use an algebraic method to find how much Jen pays **in total** for 5 kg of raspberries and 7 kg of blackcurrants. [6]

7.

Sumston Village School organised a concert to raise money for charity.

All of the 120 tickets were sold for a total of £1210.
The price of an adult's ticket was £12.
The price of a child's ticket was £7.

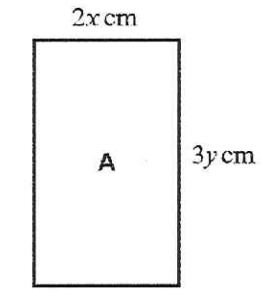
How many adult tickets and how many child tickets were sold?
You must use an algebraic method. [4]

Number of adult tickets = ...

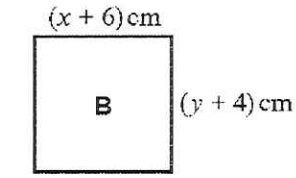
Number of child tickets = ...

8.

The rectangles **A** and **B** have perimeters of 94 cm and 56 cm as shown below.



Perimeter = 94 cm



Perimeter = 56 cm

Diagrams not drawn to scale

Use an algebraic method to calculate the area of each rectangle. [8]

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

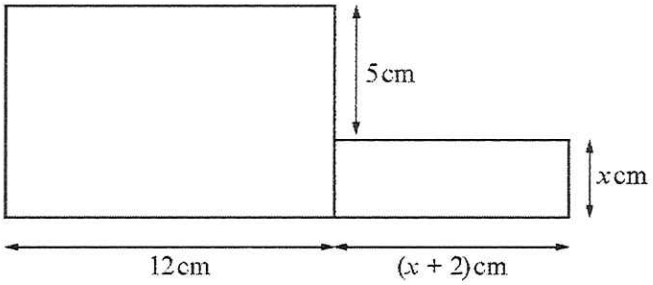


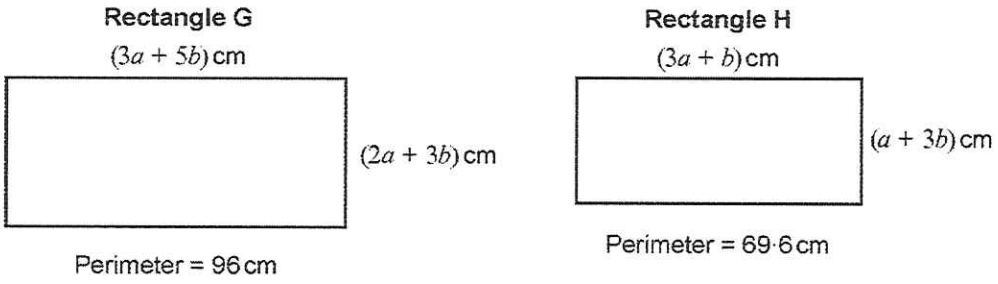
Diagram not drawn to scale

The area of the larger rectangle is $4y$ cm^2.
The area of the smaller rectangle is y cm^2.

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

[8]

10. The dimensions and perimeters of two rectangles, G and H, are shown below.



Diagrams not drawn to scale

Freya has written an equation for rectangle G:

$$10a + 16b = 96$$

(a) Write down an equation for rectangle H. [1]

.....

.....

(b) Use an algebraic method to calculate a and b.
Hence, calculate the dimensions of rectangle H. [5]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Length of rectangle H is ..... cm

Width of rectangle H is ..... cm

11.

The Davies family want to buy some garden furniture. Their local garden centre stocks the particular brand they would like.

The price of one garden bench and four chairs is £310.
The price of two garden benches and three chairs is £345.

The Davies family have £450 available to spend.

Do they have enough money to buy two garden benches and five chairs?

You must show all your working. [5]

12.

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]

Price of a key ring = ...

Price of a pencil = ...