

Simultaneous Equations

Question Paper 2

Level	OCR
Subject	Maths
Exam Board	GCSE (9-1)
Topic	Algebra
Sub Topic	Simultaneous Equations
Grade Level	Grade 5
Booklet	Question Paper 2

Time Allowed: 51 minutes

Score: /42

Percentage: /100

- 1 (a) Solve this quadratic equation by factorisation.

$$x^2 - 7x + 10 = 0$$

(a) _____ [3]

- (b) Solve algebraically these simultaneous equations.

$$\begin{aligned}4x + 3y &= 6 \\ y &= 13 - 5x\end{aligned}$$

(b) $x =$ _____

$y =$ _____ [4]

2 Solve, algebraically, these simultaneous equations.

$$\begin{aligned}20x + 3y &= 1 \\ 6x - 5y &= 18\end{aligned}$$

$x = \underline{\hspace{10cm}}$

$y = \underline{\hspace{10cm}} \quad [4]$

- 3 Emil makes chairs and stools.
Each chair has 4 legs and each stool has 3 legs.
Emil has made c chairs and t stools.
In total the chairs and stools have 76 legs.

This information gives the equation

$$4c + 3t = 76.$$

- (a) Emil has made a total of 22 chairs and stools.

Complete this equation to show this information.

$$c + t = \boxed{} \quad [1]$$

- (b) Use algebra to solve these two equations simultaneously to find out how many chairs and how many stools Emil has made.

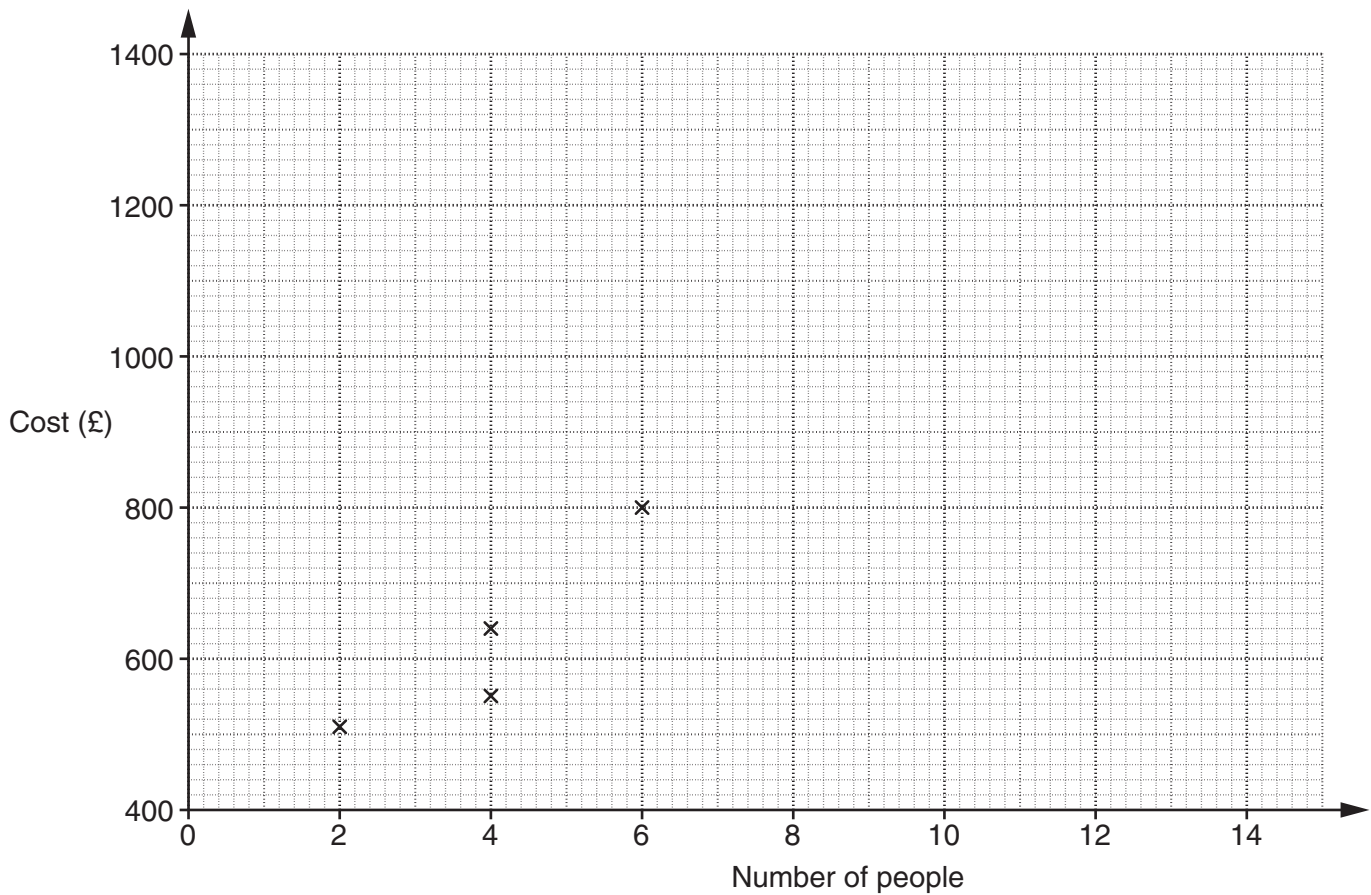
(b) chairs, $c =$ _____

stools, $t =$ _____ [3]

- 4 *Island Holidays* has many cottages for rent in the Shetland Islands. They are for any number of people from 2 to 15. The table shows information for nine of their cottages. It shows the number of people each cottage can accommodate, and the cost of renting it for a week in July.

Number of people	2	4							12
Cost (£)	510	640	550	800	820	1040	1130	1110	1350

The results for the first four cottages are plotted on the scatter diagram.



- (a) Complete the scatter diagram and draw a line of best fit.

[3]

- (b)* Lizzie wants to rent a cottage for 10 people for a week in July.
She expects the food bill to be £400.
The cost of food and rent is to be shared equally between the 10 people.

Calculate how much each person should expect to pay.
Explain **how** you have worked out your answer.

- 5 (a) Rearrange this formula to make p the subject.

$$t = 2p - 3$$

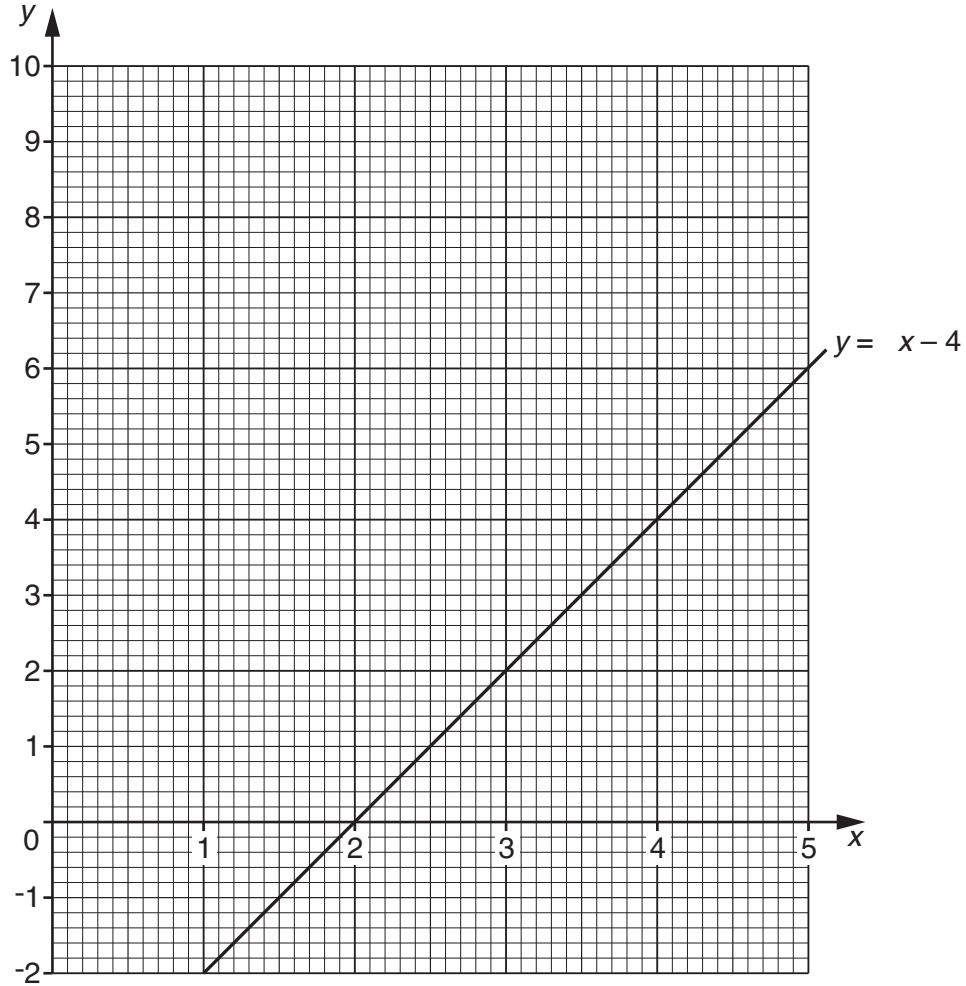
(a) _____ [2]

- (b) Solve these simultaneous equations.

$$\begin{aligned}x + y &= 7 \\x - y &= -3\end{aligned}$$

(b) $x =$ _____ $y =$ _____ [2]

6 The grid shows the graph of $y = 2x - 4$.



(a) Complete the table for $y = x^2 - 4x + 3$.

x	0	1	2	3	4	5
y	3	0		0	3	

[2]

(b) On the grid, draw the graph of $y = x^2 - 4x + 3$ for $0 \leq x \leq 5$.

[2]

(c) Use your graphs to solve these simultaneous equations.

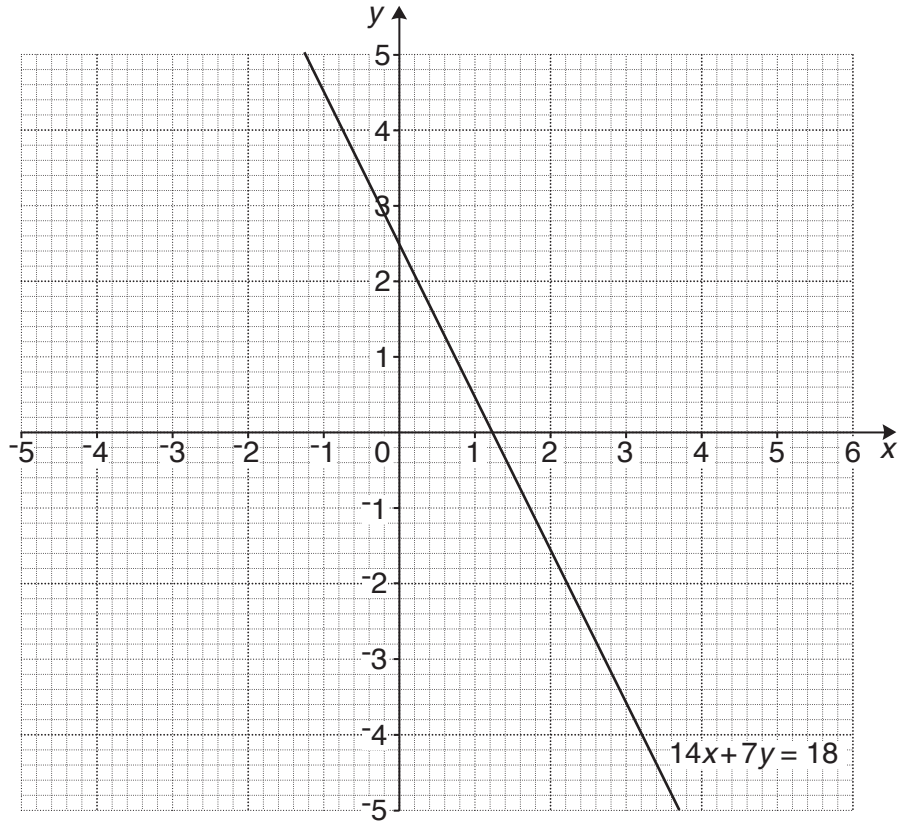
$$y = 2x - 4$$

$$y = x^2 - 4x + 3$$

(c) $x = \dots\dots\dots y = \dots\dots\dots$

$x = \dots\dots\dots y = \dots\dots\dots$ [2]

7 (a) The grid shows the graph of $14x + 7y = 18$.



(i) Complete this table of values for $y = 2x + 2$.

x	-3	0	1
y			

[2]

(ii) On the grid, draw the straight line graph of $y = 2x + 2$.

[2]

(iii) Use your graph to find the approximate solution of these simultaneous equations.

$$14x + 7y = 18$$

$$y = 2x + 2$$

(a)(iii) $x =$ _____

$y =$ _____ [1]

(b) (i) Use **algebra** to find the **exact** solution of these simultaneous equations.

$$14x + 7y = 18$$

$$y = 2x + 2$$

(b)(i) $x =$ _____

$y =$ _____ [4]

(ii) Explain why reading off the graph did not give the **exact** solution to these simultaneous equations.

_____ [1]