

## Solving Simultaneous Equations Graphically

Please write clearly in block capitals

Forename:

Surname:

### Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

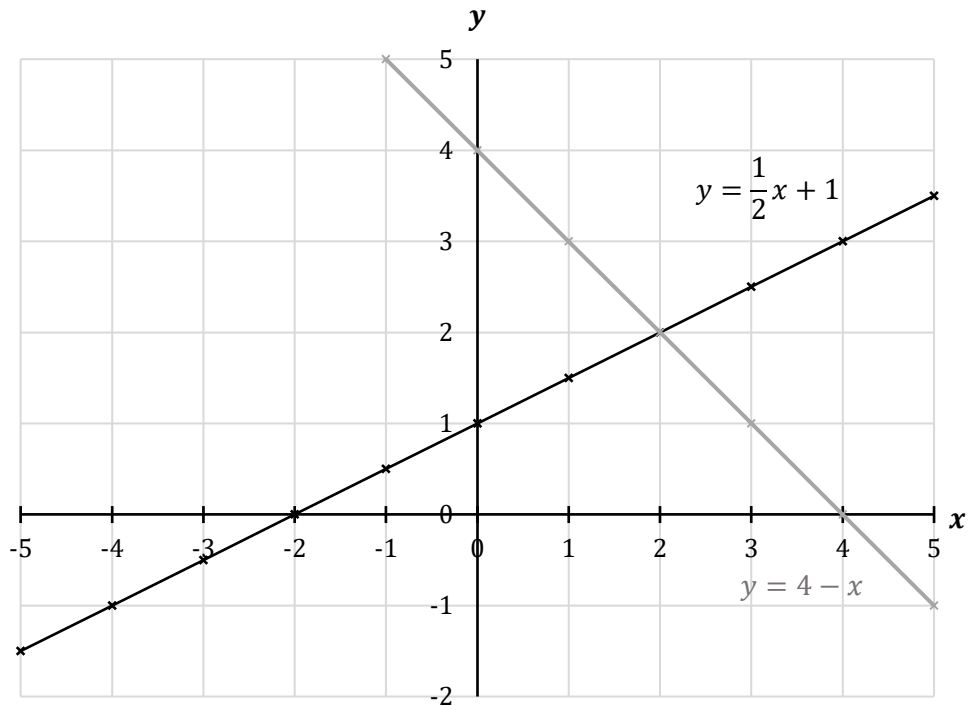
### Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

### Advice

- In all calculations, show clearly how you work out your answer.

- 1 The graph below shows the lines of the equations  $y = \frac{1}{2}x + 1$  and  $y = 4 - x$ .



Using the graph, solve the following simultaneous equations:

$$y = \frac{1}{2}x + 1$$

$$y = 4 - x$$

[2 marks]

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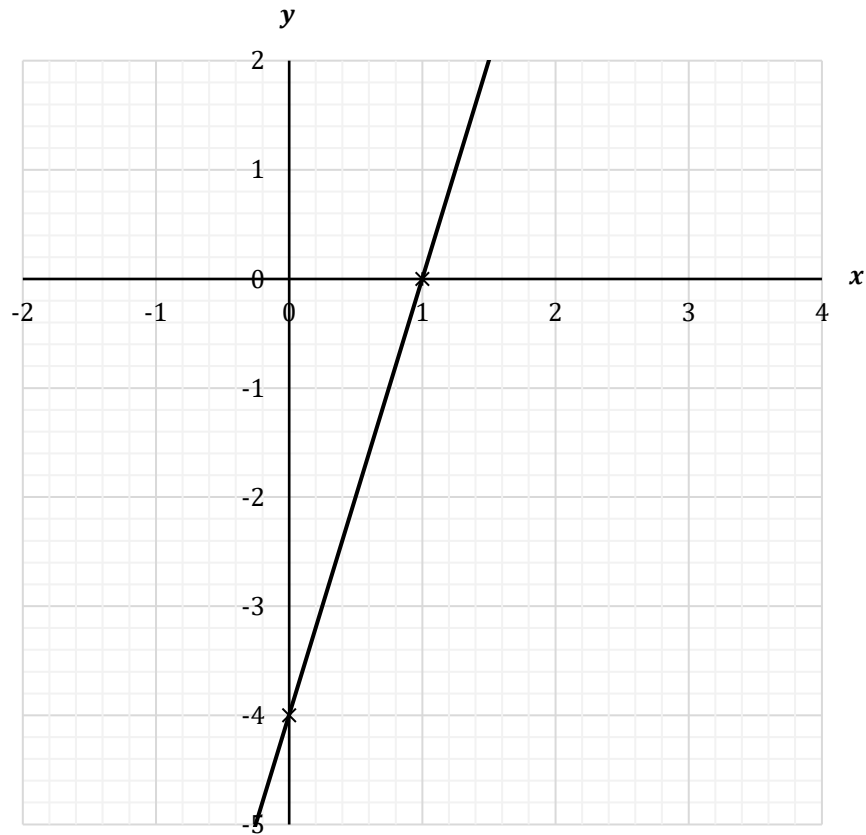
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$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_

Turn over for next question

Turn over ►

- 2 The graph below shows the line of the equation  $y = 4x - 4$ .



- 2(a) Complete the table below for the function  $y = -x + 1$

[1 mark]

$x$	-1	0	1	2	3
$y$	2				

- 2(b) Plot  $y = -x + 1$  on the graph above and hence solve the simultaneous equations

$$y = 4x - 4$$

$$y = -x + 1$$

[3 marks]

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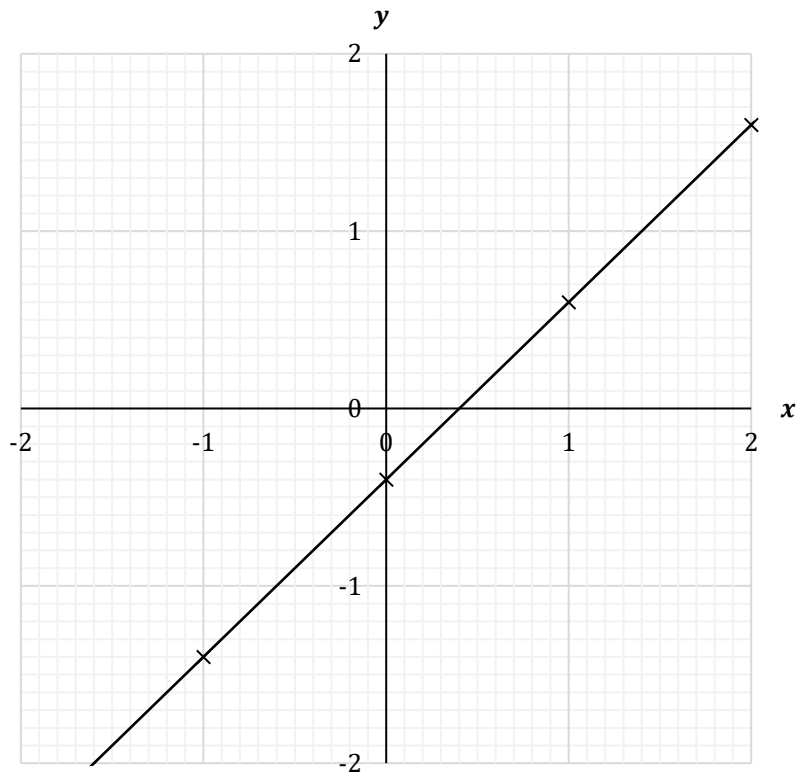
$$x = \underline{\hspace{4cm}}$$

$$y = \underline{\hspace{4cm}}$$

Turn over for next question

Turn over ►

- 3 The graph below shows the line of the equation  $y = x - 0.4$ .



- 3(a) Complete the following table for the function  $y = \frac{1}{4}x + 0.35$

[1 mark]

$x$	-2	-1	0	1	2
$y$	-0.15				0.85

- 3(b) Draw a graph of  $y = \frac{1}{4}x + 0.35$  on the graph above and hence solve the simultaneous equations

$$y = x - 0.4$$

$$y = \frac{1}{4}x + 0.35$$

[3 marks]

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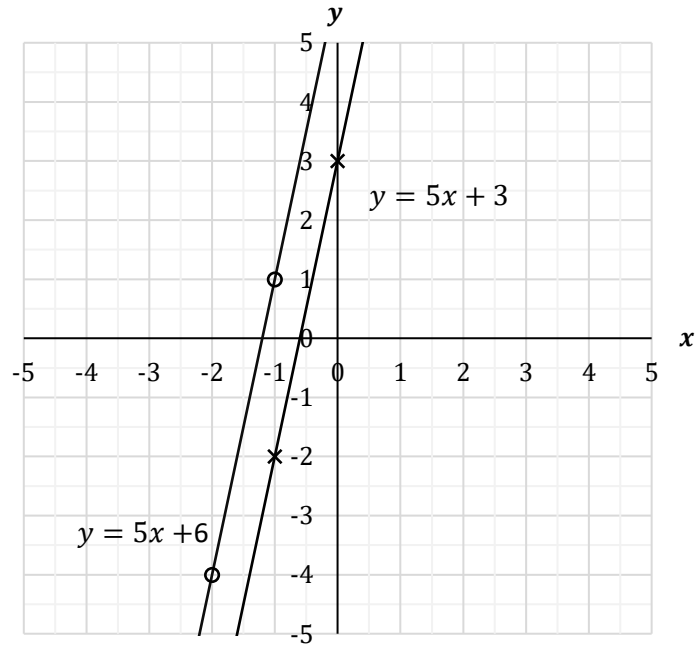
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$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

Turn over ►

- 4 The graph below shows the line of the equations  $y = 5x + 3$  and  $y = 5x + 6$ .



- 4(a) Using the values below draw the line for the function  $y = 2x + 3$  on the above graph.

[1 mark]

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

- 4(b) Hence solve the simultaneous equations

$$y = 2x + 3$$

$$y = 5x + 6$$

[2 marks]

$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_

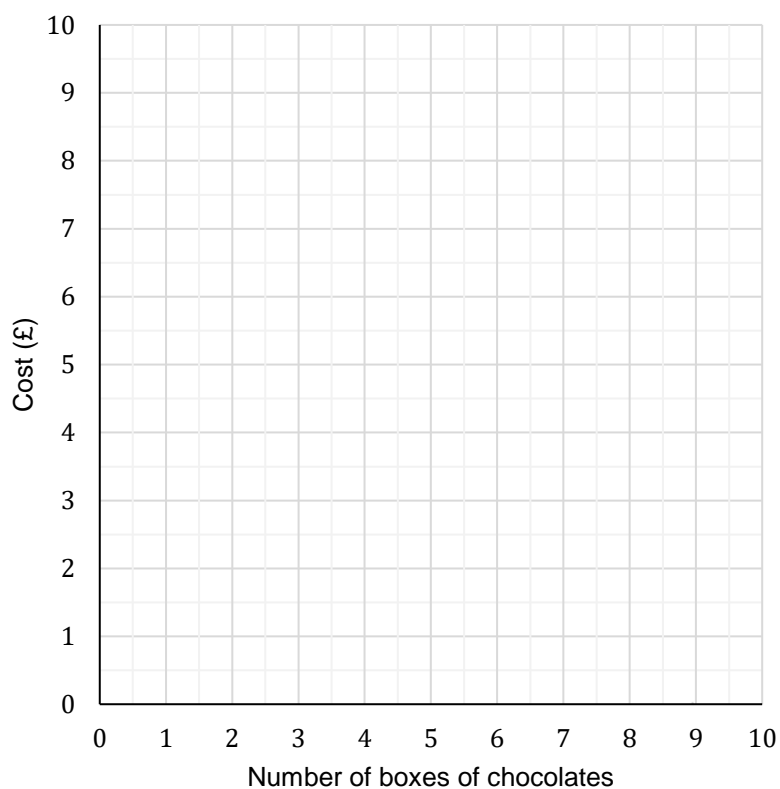
- 4(c) State how you know that the lines  $y = 5x + 3$  and  $y = 5x + 6$  can not form simultaneous equations.

[1 mark]

\_\_\_\_\_  
 \_\_\_\_\_

- 5 ChocZ chocolates are sold at £0.50 a box, plus £4.00 delivery on the total order.
- Sweets2Go chocolates sell the same box of chocolates for £1.00 each but charge £1.00 for delivery on the total order.
- Using the graph below, form and plot two equations representing the two company's sales models.
- State clearly the point at which it becomes cheaper to buy chocolates from ChocZ.

[6 marks]




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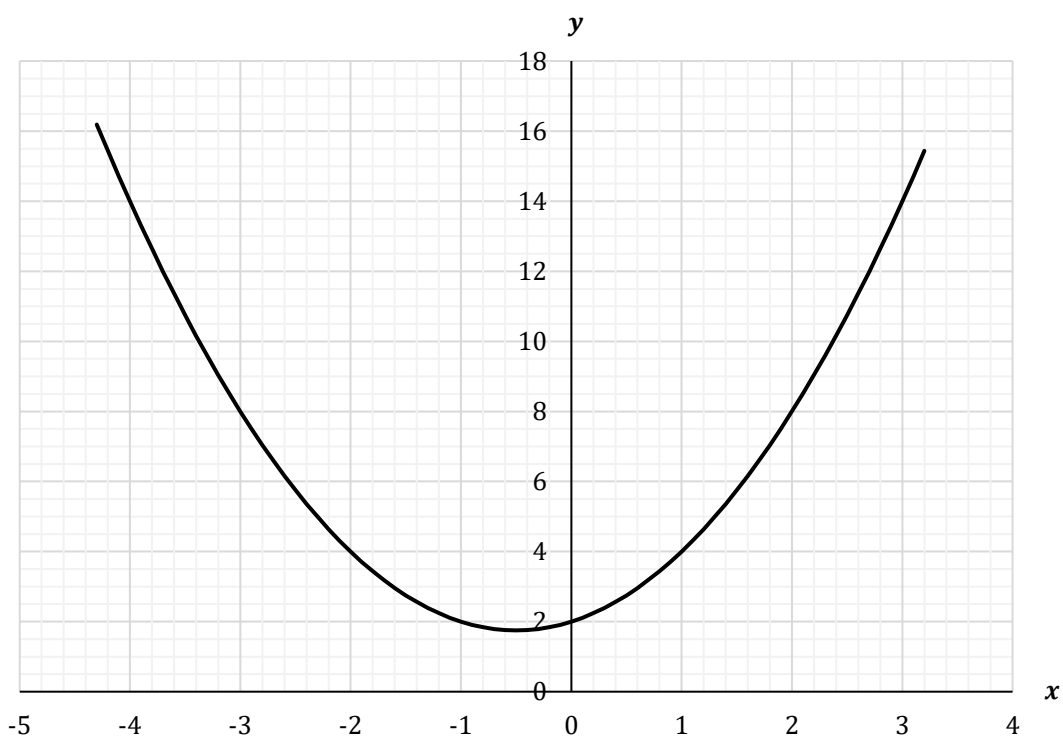
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Answer \_\_\_\_\_

**Turn over for next question**

Turn over ►

- 6 The graph below shows the line of the equation  $y = x^2 + x + 2$ , for the values of  $-4.3 < x < 3.2$



- 6(a) Complete the following table for the function  $y = 0.5x + 8$

[1 mark]

$x$	-4	-3	-2	-1	0	1	2	3
$y$								

- 6(b) Hence estimate solutions to the following simultaneous equations

$$y = x^2 + x + 2$$

$$y = 0.5x + 8$$

A solution obtained algebraically will not be accepted.

[4 marks]

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