

GCSE MATHS • GRADE 5

MATHS



MODEL ANSWERS

SOLVING SIMULTANEOUS EQUATIONS GRAPHICALLY

SCORE

/92

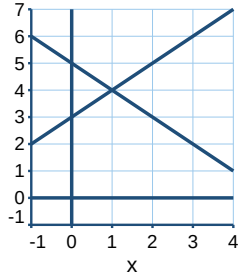
PERCENTAGE

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STEMUP

- 1 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $y = -x + 5$ and $3x - 3y = -9$

y

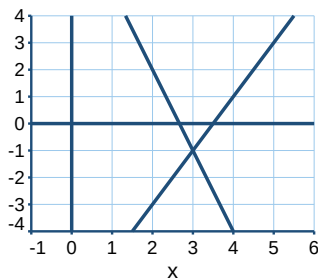
lines cross at (1, 4)

$$x = 1, y = 4$$

 / 1

- 2 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $y = -3x + 8$ and $2x - y = 7$

y

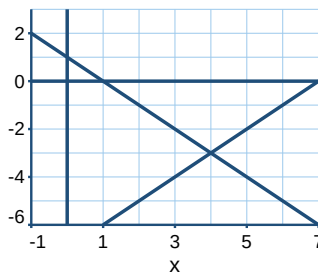
lines cross at (3, -1)

$$x = 3, y = -1$$

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- 3 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $2x - 2y = 14$ and $x + y = 1$

y

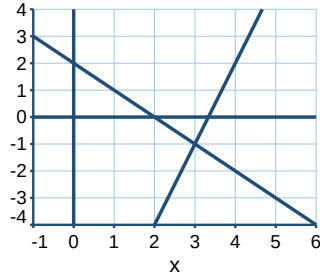
lines cross at (4, -3)

$$x = 4, y = -3$$

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- 4 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $3x + 3y = 6$ and $y = 3x - 10$

y



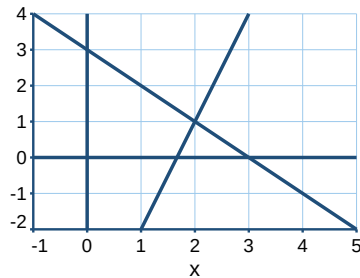
lines cross at (3, -1)

$$x = 3, y = -1$$

1 / 1

- 5 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $2x + 2y = 6$ and $y = 3x - 5$

y



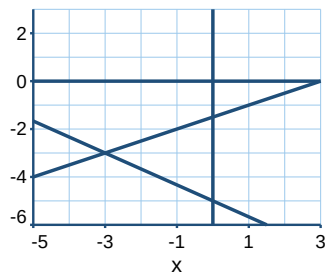
lines cross at (2, 1)

$$x = 2, y = 1$$

1 / 1

- 6 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $2x + 3y = -15$ and $x - 2y = 3$

y

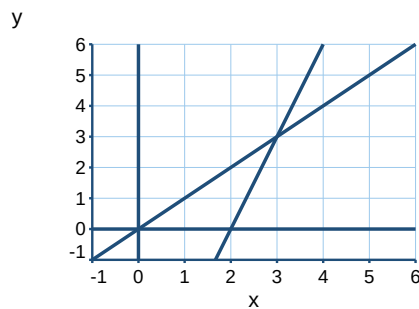


lines cross at (-3, -3)

$$x = -3, y = -3$$

1 / 1

- 7 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $y = 3x - 6$ and $x - y = 0$

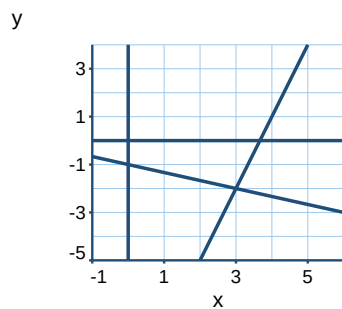


lines cross at (3, 3)

$x = 3, y = 3$

/ 1

- 8 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x + 3y = -3$ and $y = 3x - 11$

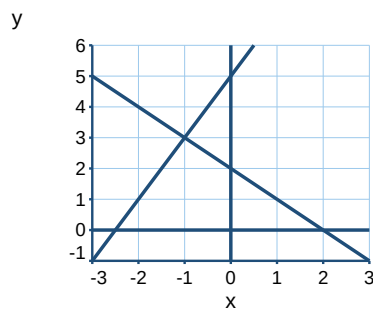


lines cross at (3, -2)

$x = 3, y = -2$

/ 1

- 9 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x + y = 2$ and $2x - y = -5$

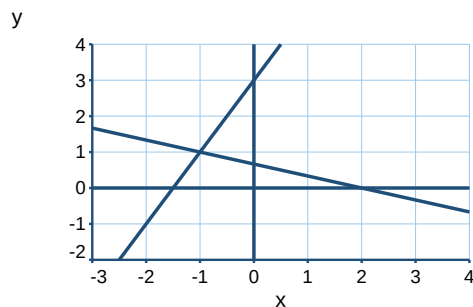


lines cross at (-1, 3)

$x = -1, y = 3$

/ 1

- 10** Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x + 3y = 2$ and $y = 2x + 3$

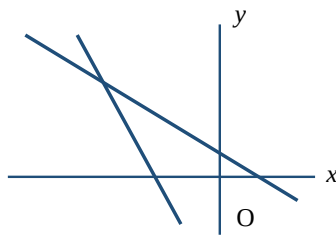


lines cross at $(-1, 1)$

$x = -1, y = 1$

/ 1

- 11** The diagram shows two straight lines.
The equations of the lines are $y = -x + 1$ and $y = -3x - 5$.
Work out the coordinates of the point where the lines intersect.

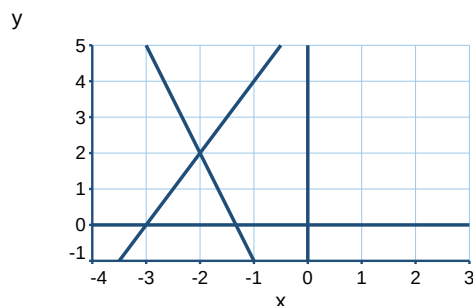


*$-x + 1 = -3x - 5$
 $x = -3$
 $y = 4$*

$(-3, 4)$

/ 1

- 12** Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $2x - y = -6$ and $3x + y = -4$

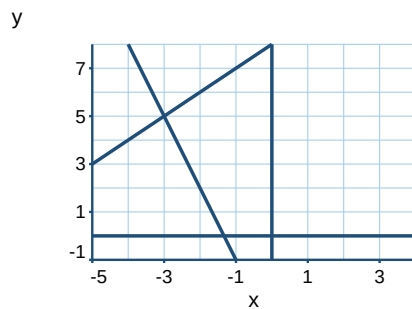


lines cross at $(-2, 2)$

$x = -2, y = 2$

/ 1

- 13 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $y = x + 8$ and $3x + y = -4$

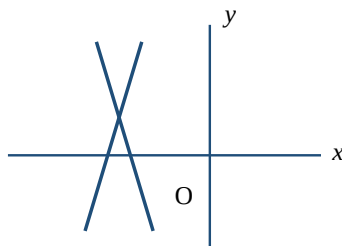


lines cross at $(-3, 5)$

$x = -3, y = 5$

1 / 1

- 14 The diagram shows two straight lines.
The equations of the lines are $y = -4x - 7$ and $y = 4x + 9$.
Work out the coordinates of the point where the lines intersect.

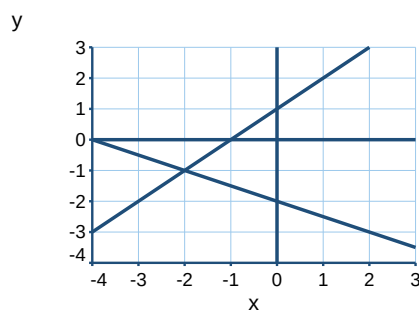


$$\begin{aligned} -4x - 7 &= 4x + 9 \\ x &= -2 \\ y &= 1 \end{aligned}$$

$(-2, 1)$

1 / 1

- 15 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x + 2y = -4$ and $x - y = -1$



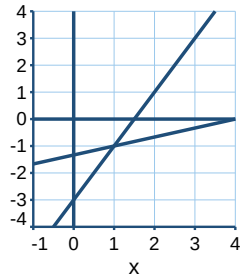
lines cross at $(-2, -1)$

$x = -2, y = -1$

1 / 1

- 16** Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x - 3y = 4$ and $y = 2x - 3$

y

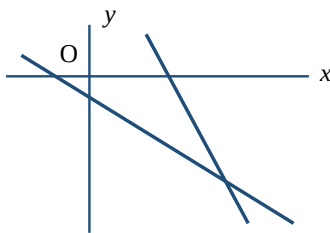


lines cross at (1, -1)

$$x = 1, y = -1$$

1 / 1

- 17** The diagram shows two straight lines.
The equations of the lines are $y = -3x + 7$ and $y = -x - 1$.
Work out the coordinates of the point where the lines intersect.



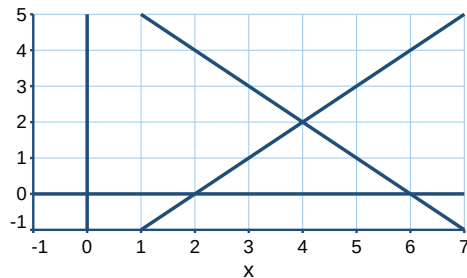
$$\begin{aligned} -3x + 7 &= -x - 1 \\ x &= 4 \\ y &= -5 \end{aligned}$$

$$(4, -5)$$

1 / 1

- 18** Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $3x + 3y = 18$ and $x - y = 2$

y

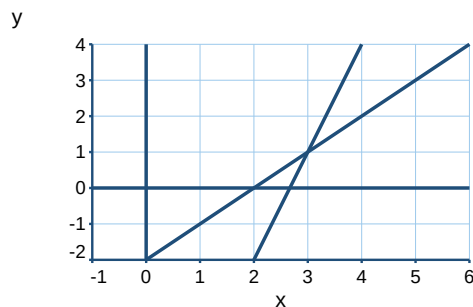


lines cross at (4, 2)

$$x = 4, y = 2$$

1 / 1

- 19 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $3x - y = 8$ and $y = x - 2$

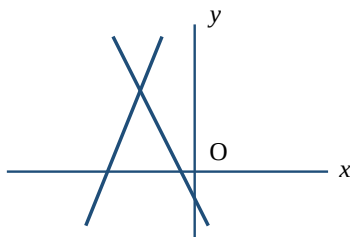


lines cross at (3, 1)

$x = 3, y = 1$

1 / 1

- 20 The diagram shows two straight lines.
The equations of the lines are $y = 5x + 8$ and $y = -4x - 1$.
Work out the coordinates of the point where the lines intersect.

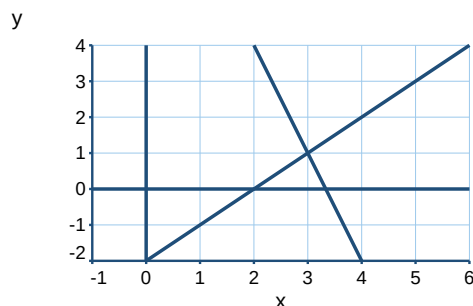


$$\begin{aligned} 5x + 8 &= -4x - 1 \\ x &= -1 \\ y &= 3 \end{aligned}$$

$(-1, 3)$

1 / 1

- 21 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x - y = 2$ and $3x + y = 10$



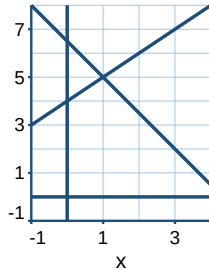
lines cross at (3, 1)

$x = 3, y = 1$

2 / 2

- 22 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $y = x + 4$ and $3x + 2y = 13$

y

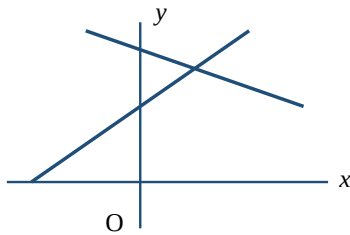
lines cross at (1, 5)

$$x = 1, y = 5$$

2

 / 2

- 23 The diagram shows two straight lines.
The equations of the lines are $y = -x + 7$ and $y = 2x + 4$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} -x + 7 &= 2x + 4 \\ x &= 1 \\ y &= 6 \end{aligned}$$

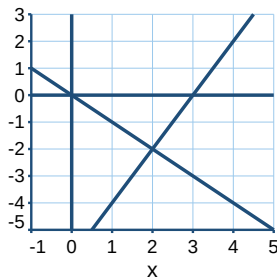
$$(1, 6)$$

2

 / 2

- 24 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $2x - y = 6$ and $2x + 2y = 0$

y

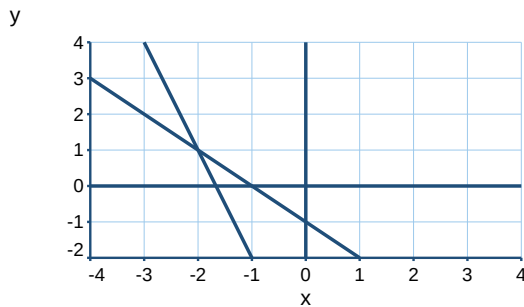
lines cross at (2, -2)

$$x = 2, y = -2$$

2

 / 2

- 25 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $3x + 3y = -3$ and $y = -3x - 5$

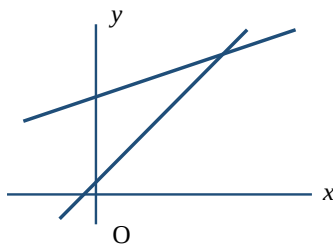


lines cross at $(-2, 1)$

$x = -2, y = 1$

2 / 2

- 26 The diagram shows two straight lines.
The equations of the lines are $y = 3x + 1$ and $y = x + 8$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} 3x + 1 &= x + 8 \\ x &= \frac{7}{2} \\ y &= \frac{23}{2} \end{aligned}$$

$(\frac{7}{2}, \frac{23}{2})$

2 / 2

- 27 The graph of $3x + y = 3$ is drawn on the grid.
(a) On the grid, draw the graph of $y = x - 3$
(b) Use the graphs to solve $3x + y = 3$ and $y = x - 3$

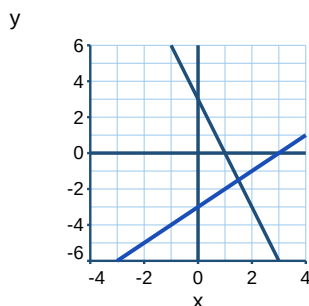
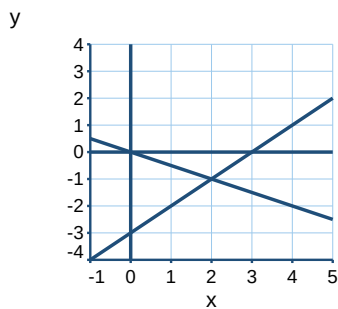


table for $y = x - 3$: $x = 0, y = -3$
 $x = 1, y = -2$
plot and join
lines cross at $(1.5, -1.5)$

(b) $x = 1.5, y = -1.5$

2 / 2

- 28 Two straight lines have been drawn on the grid.
Use the graphs to solve the simultaneous equations
 $x + 2y = 0$ and $y = x - 3$

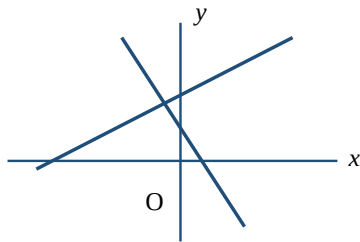


lines cross at $(2, -1)$

$$x = 2, y = -1$$

2 / 2

- 29 The diagram shows two straight lines.
The equations of the lines are $y = -3x + 1$ and $y = x + 2$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} -3x + 1 &= x + 2 \\ x &= \frac{-1}{4} \\ y &= \frac{7}{4} \end{aligned}$$

$$\left(\frac{-1}{4}, \frac{7}{4}\right)$$

2 / 2

- 30 The graph of $3x + 3y = 6$ is drawn on the grid.
(a) On the grid, draw the graph of $y = -3x + 5$
(b) Use the graphs to solve $3x + 3y = 6$ and $y = -3x + 5$

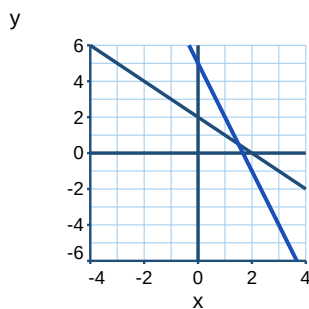
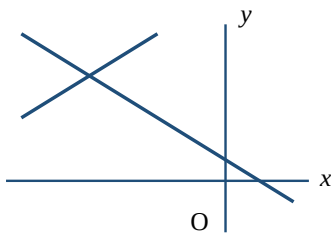


table for $y = -3x + 5$: $x = 0, y = 5$
 $x = 1, y = 2$
plot and join
lines cross at $(1.5, 0.5)$

$$(b) x = 1.5, y = 0.5$$

2 / 2

- 31 The diagram shows two straight lines.
The equations of the lines are $y = x + 9$ and $x + y = 1$.
Work out the coordinates of the point where the lines intersect.

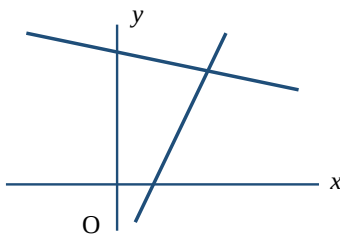


$$\begin{aligned} \text{sub } y = x + 9 \text{ into } x + y &= 1 \\ -x - x - 9 &= -1 \\ x &= -4 \\ y &= 5 \end{aligned}$$

..... $(-4, 5)$

2 / 2

- 32 The diagram shows two straight lines.
The equations of the lines are $y = 5x - 4$ and $y = -\frac{1}{2}x + 7$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} 5x - 4 &= -\frac{1}{2}x + 7 \\ x &= 2 \\ y &= 6 \end{aligned}$$

..... $(2, 6)$

2 / 2

- 33 The graph of $6x + 4y = -6$ is drawn on the grid.
(a) On the grid, draw the graph of $y = x - 4$
(b) Use the graphs to solve $6x + 4y = -6$ and $y = x - 4$

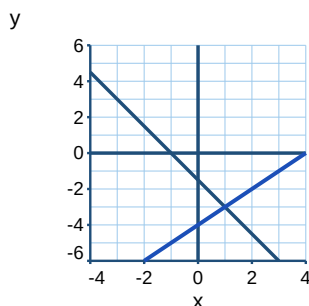
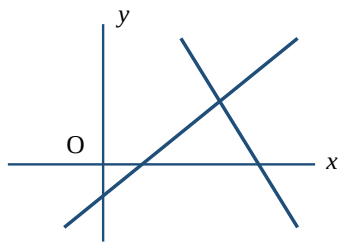


table for $y = x - 4$: $x = 0, y = -4$
plot and join
lines cross at $(1, -3)$

..... $(b) x = 1, y = -3$

2 / 2

- 34 The diagram shows two straight lines.
The equations of the lines are $y = x - 1$ and $2x + y = 8$.
Work out the coordinates of the point where the lines intersect.

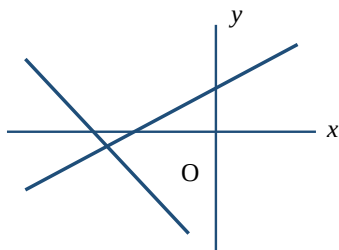


$$\begin{aligned} \text{sub } y = x - 1 \text{ into } 2x + y &= 8 \\ 2x + x - 1 &= 8 \\ x &= 3 \\ y &= 2 \end{aligned}$$

$(3, 2)$

2 / 2

- 35 The diagram shows two straight lines.
The equations of the lines are $y = -x - 3$ and $y = \frac{1}{2}x + 1$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} -x - 3 &= \frac{1}{2}x + 1 \\ x &= \frac{-8}{3} \\ y &= \frac{-1}{3} \end{aligned}$$

$(\frac{-8}{3}, \frac{-1}{3})$

2 / 2

- 36 The graph of $4x - y = -4$ is drawn on the grid.
(a) On the grid, draw the graph of $y = -2x + 1$
(b) Use the graphs to solve $4x - y = -4$ and $y = -2x + 1$

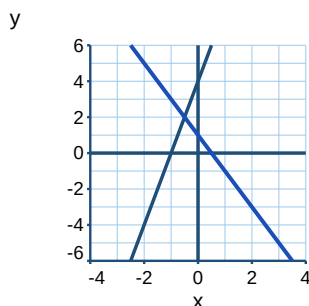
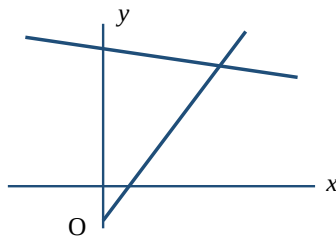


table for $y = -2x + 1$: $x = 0, y = 1$
 $x = 1, y = -1$
plot and join
lines cross at $(-0.5, 2)$

$(b) x = -0.5, y = 2$

2 / 2

- 37 The diagram shows two straight lines.
The equations of the lines are $y = 3x - 2$ and $x + 3y = 24$.
Work out the coordinates of the point where the lines intersect.

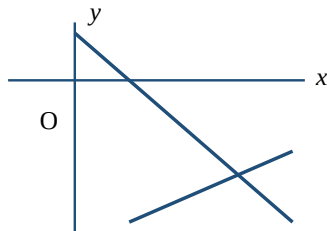


$$\begin{aligned} \text{sub } y = 3x - 2 \text{ into } x + 3y &= 24 \\ x + 9x - 6 &= 24 \\ x &= 3 \\ y &= 7 \end{aligned}$$

(3, 7)

2 / 2

- 38 The diagram shows two straight lines.
The equations of the lines are $y = -x + 2$ and $x - 2y = 14$.
Work out the coordinates of the point where the lines intersect.

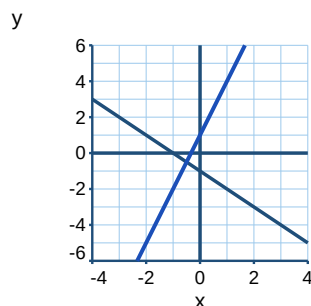


$$\begin{aligned} \text{sub } y = -x + 2 \text{ into } x - 2y &= 14 \\ -x - 2x + 4 &= -14 \\ x &= 6 \\ y &= -4 \end{aligned}$$

(6, -4)

2 / 2

- 39 The graph of $3x + 3y = -3$ is drawn on the grid.
(a) On the grid, draw the graph of $y = 3x + 1$
(b) Use the graphs to solve $3x + 3y = -3$ and $y = 3x + 1$

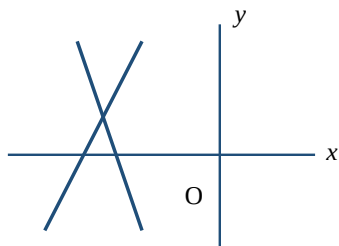


$$\begin{aligned} \text{table for } y = 3x + 1: & \quad x = 0, y = 1 \\ & \quad x = 1, y = 4 \\ \text{plot and join} & \\ \text{lines cross at } & \quad (-0.5, -0.5) \end{aligned}$$

(b) $x = -0.5, y = -0.5$

3 / 3

- 40 The diagram shows two straight lines.
The equations of the lines are $y = -3x - 8$ and $2x - y = -7$.
Work out the coordinates of the point where the lines intersect.



sub $y = -3x - 8$ into $2x - y = -7$
 $2x + 3x + 8 = -7$
 $x = -3$
 $y = 1$

$(-3, 1)$

3 / 3

- 41 The graph of $6x + y = -3$ is drawn on the grid.
(a) On the grid, draw the graph of $y = x + 4$
(b) Use the graphs to solve $6x + y = -3$ and $y = x + 4$

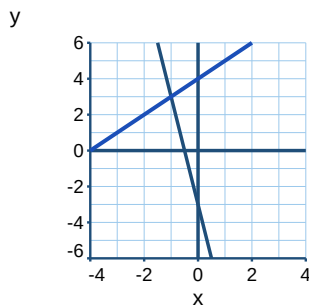


table for $y = x + 4$: $x = 0, y = 4$
 $x = 1, y = 5$
 plot and join
 lines cross at $(-1, 3)$

(b) $x = -1, y = 3$

3 / 3

- 42 The graph of $2x - 3y = 10$ is drawn on the grid.
(a) On the grid, draw the graph of $y = -2x - 2$
(b) Use the graphs to solve $2x - 3y = 10$ and $y = -2x - 2$

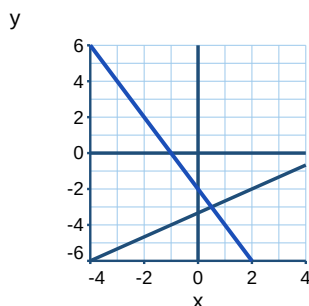
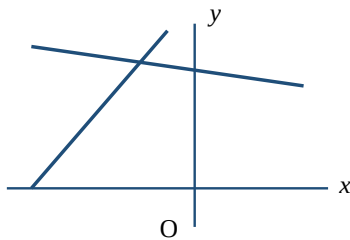


table for $y = -2x - 2$: $x = 0, y = -2$
 $x = 1, y = -4$
 plot and join
 lines cross at $(0.5, -3)$

(b) $x = 0.5, y = -3$

3 / 3

- 43 The diagram shows two straight lines.
The equations of the lines are $y = 4x + 12$ and $x + 2y = 15$.
Work out the coordinates of the point where the lines intersect.



sub $y = 4x + 12$ into $x + 2y = 15$
 $x + 8x + 24 = 15$
 $x = -1$
 $y = 8$

$(-1, 8)$

3 / 3

- 44 The graph of $2x + 3y = -3$ is drawn on the grid.
 (a) On the grid, draw the graph of $y = -2x + 1$
 (b) Use the graphs to solve $2x + 3y = -3$ and $y = -2x + 1$

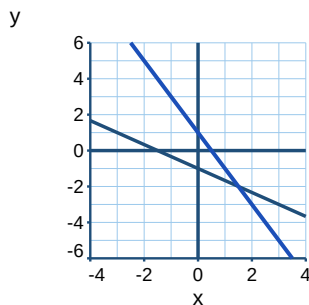


table for $y = -2x + 1$: $x = 0, y = 1$
 $x = 1, y = -1$
 plot and join
 lines cross at $(1.5, -2)$

(b) $x = 1.5, y = -2$

3 / 3

- 45 The graph of $4x + 2y = -16$ is drawn on the grid.
 (a) On the grid, draw the graph of $y = 2x + 2$
 (b) Use the graphs to solve $4x + 2y = -16$ and $y = 2x + 2$

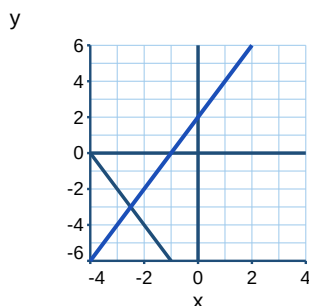
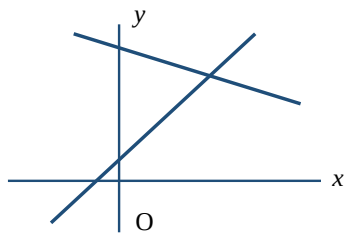


table for $y = 2x + 2$: $x = 0, y = 2$
 $x = 1, y = 4$
 plot and join
 lines cross at $(-2.5, -3)$

(b) $x = -2.5, y = -3$

3 / 3

- 46 The diagram shows two straight lines.
The equations of the lines are $y = 2x + 1$ and $2x + 3y = 19$.
Work out the coordinates of the point where the lines intersect.

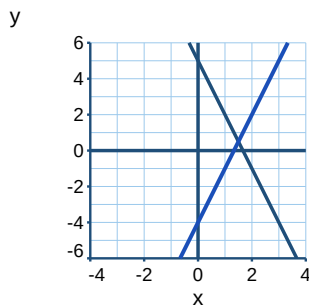


$$\begin{aligned} \text{sub } y = 2x + 1 \text{ into } 2x + 3y &= 19 \\ 2x + 6x + 3 &= 19 \\ x &= 2 \\ y &= 5 \end{aligned}$$

(2, 5)

3 / 3

- 47 The graph of $3x + y = 5$ is drawn on the grid.
(a) On the grid, draw the graph of $y = 3x - 4$
(b) Use the graphs to solve $3x + y = 5$ and $y = 3x - 4$

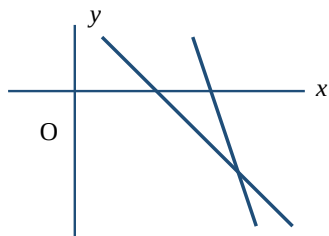


$$\begin{aligned} \text{table for } y = 3x - 4: & \quad x = 0, y = -4 \\ & \quad x = 1, y = -1 \\ \text{plot and join} & \\ \text{lines cross at } & (1.5, 0.5) \end{aligned}$$

(b) $x = 1.5, y = 0.5$

3 / 3

- 48 The diagram shows two straight lines.
The equations of the lines are $y = -x + 3$ and $3x + y = 15$.
Work out the coordinates of the point where the lines intersect.



$$\begin{aligned} \text{sub } y = -x + 3 \text{ into } 3x + y &= 15 \\ 3x - x + 3 &= 15 \\ x &= 6 \\ y &= -3 \end{aligned}$$

(6, -3)

3 / 3

- 49 The graph of $4x - 4y = -10$ is drawn on the grid.
- (a) On the grid, draw the graph of $y = -2x - 2$
- (b) Use the graphs to solve $4x - 4y = -10$ and $y = -2x - 2$

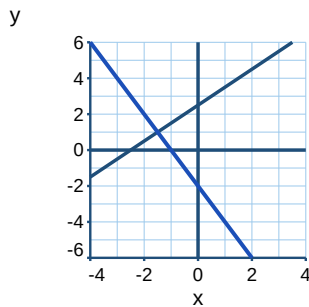
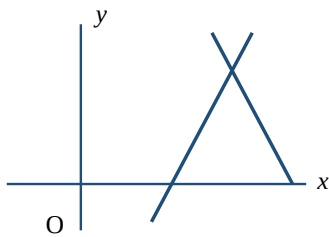


table for $y = -2x - 2$: $x = 0, y = -2$
 $x = 1, y = -4$
 plot and join
 lines cross at $(-1.5, 1)$

(b) $x = -1.5, y = 1$

3 / 3

- 50 The diagram shows two straight lines.
- The equations of the lines are $y = 3x - 9$ and $3x + y = 21$.
- Work out the coordinates of the point where the lines intersect.



sub $y = 3x - 9$ into $3x + y = 21$
 $3x + 3x - 9 = 21$
 $x = 5$
 $y = 6$

(5, 6)

3 / 3