



ACHIEVE ACADEMY

GCSE Maths — Foundation Tier

Simultaneous Equations · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Simultaneous Equations

Total marks available: 113

● Simultaneous Equations

✓ $x = 3, y = 2$

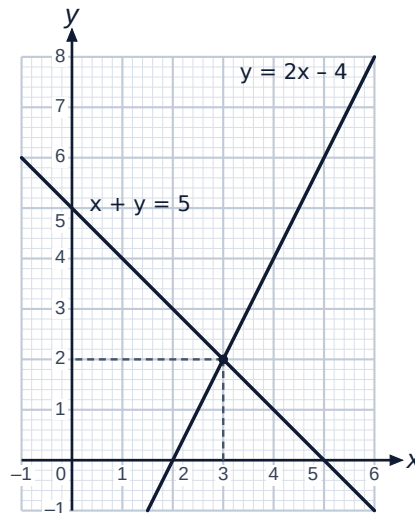
Q1 · ● Developing · 2 marks

METHOD

The solution is where the two lines cross: (3, 2)

so $x = 3, y = 2$ · B1 B1

Check: both equations are true for these values.



✓ (a) 16; (b) 8; (c) No

Q2 · ● Developing · 3 marks

METHOD

(a) $2 \times 4 + 2 \times 4 = 16$

(b) $3 \times 4 - 4 = 8$

(c) No: $3x - y = 8$, not 7, so the second equation is not true

B1 · B1 · B1

✓ $x = 1, y = 3$

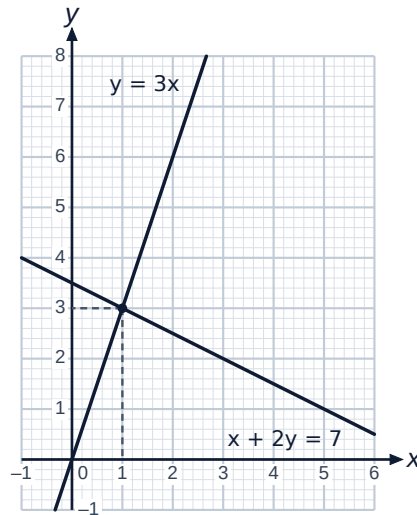
Q3 · ● Developing · 2 marks

METHOD

The solution is where the two lines cross: $(1, 3)$

so $x = 1, y = 3$ · B1 B1

Check: both equations are true for these values.



✓ (a) 20; (b) 14; (c) No

Q4 · ● Developing · 3 marks

METHOD

(a) $2 \times 6 + 2 \times 4 = 20$

(b) $3 \times 6 - 4 = 14$

(c) No: $3x - y = 14$, not 13, so the second equation is not true

B1 · B1 · B1

✓ $x = 1, y = 1$

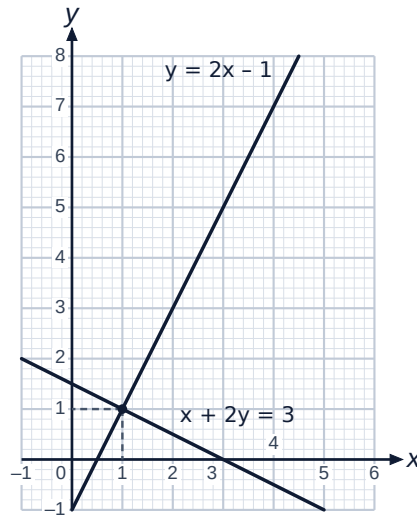
Q5 · ● Developing · 2 marks

METHOD

The solution is where the two lines cross: (1, 1)

so $x = 1, y = 1$ B1 B1

Check: both equations are true for these values.



✓ (a) 30; (b) 2; (c) Yes

Q6 · ● Developing · 3 marks

METHOD

(a) $3 \times 4 + 3 \times 6 = 30$

(b) $2 \times 4 - 6 = 2$

(c) Yes: both equations are true

B1 · B1 · B1

✓ (a) 6; (b) 3; (c) Yes

Q7 · ● Developing · 3 marks

METHOD

(a) $1 \times 2 + 4 \times 1 = 6$

(b) $2 \times 2 - 1 = 3$

(c) Yes: both equations are true

B1 · B1 · B1

✓ $x = 4, y = 6$

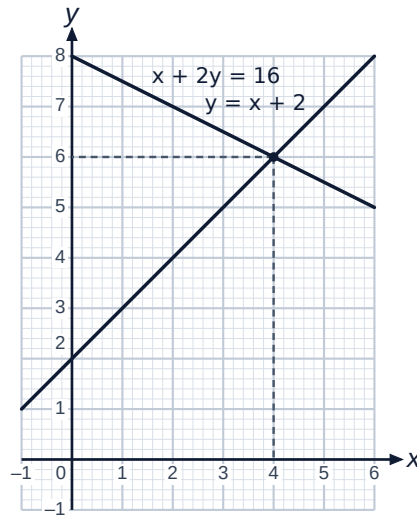
Q8 · ● Developing · 2 marks

METHOD

The solution is where the two lines cross: (4, 6)

so $x = 4, y = 6$ · B1 B1

Check: both equations are true for these values.



✓ $x = 2, y = 3$

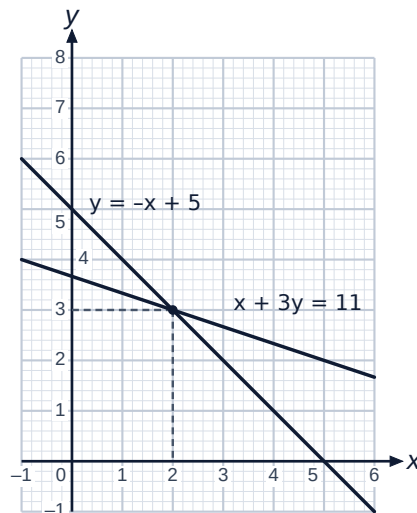
Q9 · ● Developing · 2 marks

METHOD

The solution is where the two lines cross: (2, 3)

so $x = 2, y = 3$ · B1 B1

Check: both equations are true for these values.



✓ (a) 11; (b) 7; (c) Yes

Q10 · ● Developing · 3 marks

METHOD

(a) $3 \times 3 + 1 \times 2 = 11$

(b) $3 \times 3 - 2 = 7$

(c) Yes: both equations are true

B1 · B1 · B1

✓ (a) lines drawn (see below); (b) $x = 1, y = 4$

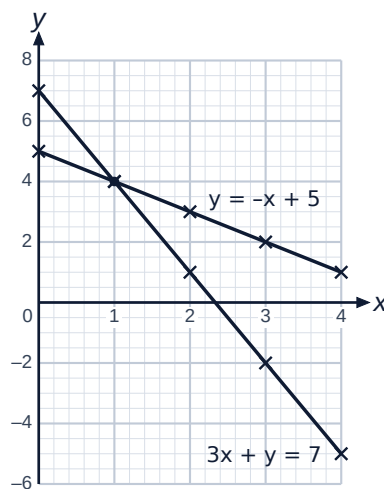
Q11 · ● Secure · 4 marks

METHOD

(a) Plot each table and join the points with a ruled straight line · B1 each line

(b) The lines cross at (1, 4), so $x = 1, y = 4$ · B1

x	0	1	2	3	4
$y = -x + 5$	5	4	3	2	1
$3x + y = 7$	7	4	1	-2	-5



✓ $a = 1, b = 4$

Q12 · ● Secure · 4 marks

METHOD

Subtract the equations to eliminate b: $3a = 3$

$a = 3 \div 3 = 1$

Substitute into the first equation: $4 \times 1 + b = 8$, so $b = 4$

M1 eliminate · A1 · M1 substitute · A1

✓ (a) lines drawn (see below); (b) $x = 2, y = 2$

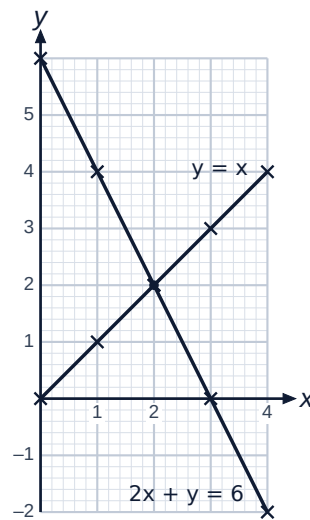
Q13 · ● Secure · 4 marks

METHOD

(a) Plot each table and join the points with a ruled straight line · B1 each line

(b) The lines cross at $(2, 2)$, so $x = 2, y = 2$ · B1

x	0	1	2	3	4
$y = x$	0	1	2	3	4
$2x + y = 6$	6	4	2	0	-2



✓ (a) lines drawn (see below); (b) $x = 3, y = 2$

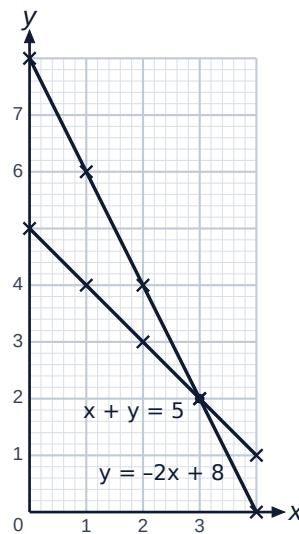
Q14 · ● Secure · 4 marks

METHOD

(a) Plot each table and join the points with a ruled straight line · B1 each line

(b) The lines cross at (3, 2), so $x = 3, y = 2$ · B1

x	0	1	2	3	4
$y = -2x + 8$	8	6	4	2	0
$x + y = 5$	5	4	3	2	1



✓ $a = 7, b = 6$

Q15 · ● Secure · 4 marks

METHOD

Subtract the equations to eliminate b : $2a = 14$

$a = 14 \div 2 = 7$

Substitute into the first equation: $5 \times 7 + 2b = 47$, so $b = 6$

M1 eliminate · A1 · M1 substitute · A1

✓ $x = 5, y = 3$

Q16 · ● Secure · 4 marks

METHOD

Add the equations to eliminate y : $3x = 15$

$$x = 15 \div 3 = 5$$

Substitute into the first equation: $1 \times 5 + 2y = 11$, so $y = 3$

M1 eliminate · A1 · M1 substitute · A1

✓ $p = 4, q = 5$

Q17 · ● Secure · 4 marks

METHOD

Add the equations to eliminate q : $3p = 12$

$$p = 12 \div 3 = 4$$

Substitute into the first equation: $1 \times 4 + q = 9$, so $q = 5$

M1 eliminate · A1 · M1 substitute · A1

✓ $a = 6, b = 2$

Q18 · ● Secure · 4 marks

METHOD

Subtract the equations to eliminate b : $2a = 12$

$$a = 12 \div 2 = 6$$

Substitute into the first equation: $4 \times 6 + 3b = 30$, so $b = 2$

M1 eliminate · A1 · M1 substitute · A1

✓ (a) lines drawn (see below); (b) $x = 3, y = 5$

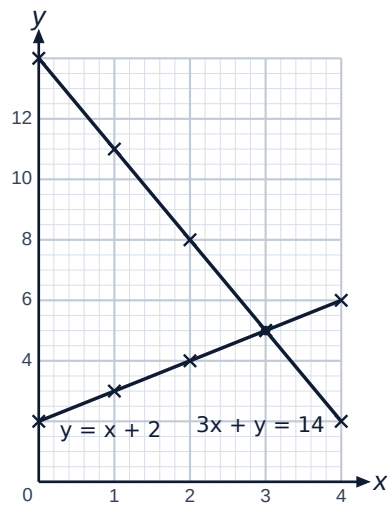
Q19 · ● Secure · 4 marks

METHOD

(a) Plot each table and join the points with a ruled straight line · B1 each line

(b) The lines cross at (3, 5), so $x = 3, y = 5$ · B1

x	0	1	2	3	4
$y = x + 2$	2	3	4	5	6
$3x + y = 14$	14	11	8	5	2



✓ $x = 2, y = 2$

Q20 · ● Secure · 4 marks

METHOD

Add the equations to eliminate y : $4x = 8$

$$x = 8 \div 4 = 2$$

Substitute into the first equation: $1 \times 2 + 3y = 8$, so $y = 2$

M1 eliminate · A1 · M1 substitute · A1

✓ $x = 6, y = 8$

Q21 · ● Greater Depth · 4 marks

METHOD

Substitute $y = x + 2$ into the second equation:

$$3x + (x + 2) = 26$$

$$4x + 2 = 26, \text{ so } x = 6$$

$$y = 1 \times 6 + 2 = 8$$

M1 substitute · M1 · A1 · A1

✓ burger: £4, drink: £3

Q22 · ● Greater Depth · 5 marks

METHOD

Let x = cost of one burger and y = cost of one drink

$$2x + 2y = 14$$

$$4x + 2y = 22$$

Solving simultaneously: $x = 4, y = 3$

M1 form both equations · M1 eliminate · A1 · A1

✓ $p = -3, q = 2$

Q23 · ● Greater Depth · 4 marks

METHOD

Multiply the first equation by 3: $3p + 3q = -3$

Add to the second equation: $8p = -24$, so $p = -3$

Substitute: $1 \times (-3) + q = -1$, so $q = 2$

M1 scale · M1 eliminate · A1 · A1

✓ $p = 7, q = 4$

Q24 · ● Greater Depth · 4 marks

METHOD

Multiply the first equation by 2: $4p + 2q = 36$

Add to the second equation: $6p = 42$, so $p = 7$

Substitute: $2 \times 7 + q = 18$, so $q = 4$

M1 scale · M1 eliminate · A1 · A1

✓ apple: 20p, banana: 10p

Q25 · ● Greater Depth · 5 marks

METHOD

Let x = cost of one apple and y = cost of one banana in pence

$$4x + 4y = 120$$

$$4x + 3y = 110$$

Solving simultaneously: $x = 20$, $y = 10$

M1 form both equations · M1 eliminate · A1 · A1

✓ $x = 6$, $y = 18$

Q26 · ● Greater Depth · 4 marks

METHOD

Substitute $y = 3x$ into the second equation:

$$2x + 3(3x) = 66$$

$$11x = 66, \text{ so } x = 6$$

$$y = 3 \times 6 = 18$$

M1 substitute · M1 · A1 · A1

✓ (a) 5, 2; 5, 3; (b) lines drawn (see below); (c) $x = 1, y = 5$

Q27 • Greater Depth • 6 marks

METHOD

(a) $y = -x + 6$: $x = 1$ gives $y = 5$, $x = 4$ gives $y = 2$

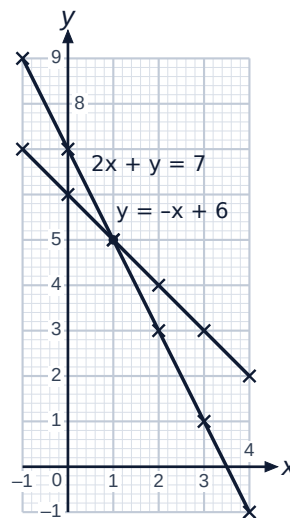
$2x + y = 7$: $x = 1$ gives $y = 5$, $x = 2$ gives $y = 3$

B2 all correct (B1 for at least two)

(b) Plot each table and join the points with a ruled straight line • B1 each line

(c) The lines cross at (1, 5), so $x = 1, y = 5$ • B1

x	-1	0	1	2	3	4
$y = -x + 6$	7	6	5	4	3	2
$2x + y = 7$	9	7	5	3	1	-1



✓ $x = 3, y = 1$

Q28 • Greater Depth • 4 marks

METHOD

Multiply the first equation by 2: $6x + 4y = 22$

Add to the second equation: $10x = 30$, so $x = 3$

Substitute: $3 \times 3 + 2y = 11$, so $y = 1$

M1 scale • M1 eliminate • A1 • A1

✓ (a) 4, 1; 2, -4; (b) lines drawn (see below); (c) $x = 1, y = 2$

Q29 · ● Greater Depth · 6 marks

METHOD

(a) $y = -x + 3$: $x = -1$ gives $y = 4$, $x = 2$ gives $y = 1$

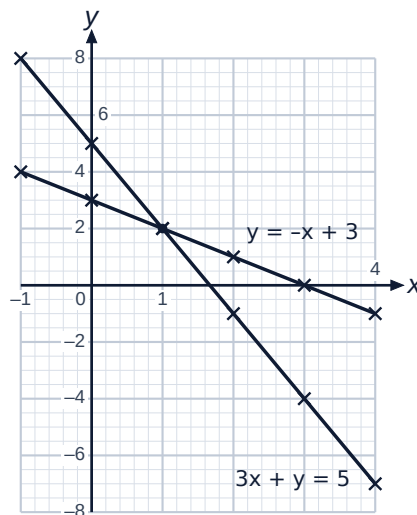
$3x + y = 5$: $x = 1$ gives $y = 2$, $x = 3$ gives $y = -4$

B2 all correct (B1 for at least two)

(b) Plot each table and join the points with a ruled straight line · B1 each line

(c) The lines cross at (1, 2), so $x = 1, y = 2$ · B1

x	-1	0	1	2	3	4
$y = -x + 3$	4	3	2	1	0	-1
$3x + y = 5$	8	5	2	-1	-4	-7



✓ (a) $-4, -2; 8, 6$; (b) lines drawn (see below); (c) $x = 2, y = 2$

Q30 · ● Greater Depth · 6 marks

METHOD

(a) $y = 2x - 2$: $x = -1$ gives $y = -4$, $x = 0$ gives $y = -2$

$2x + y = 6$: $x = -1$ gives $y = 8$, $x = 0$ gives $y = 6$

B2 all correct (B1 for at least two)

(b) Plot each table and join the points with a ruled straight line · B1 each line

(c) The lines cross at $(2, 2)$, so $x = 2, y = 2$ · B1

x	-1	0	1	2	3	4
$y = 2x - 2$	-4	-2	0	2	4	6
$2x + y = 6$	8	6	4	2	0	-2

