



ACHIEVE ACADEMY

GCSE Maths — Foundation Tier

Straight-Line Graphs · 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.

Straight-Line Graphs

Total marks available: 81

● Straight-Line Graphs

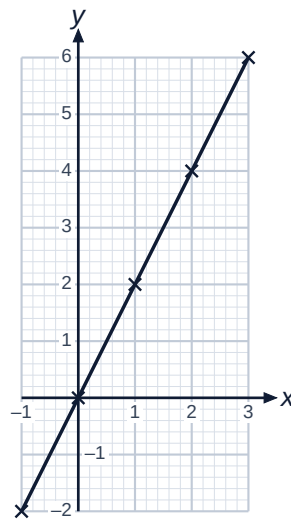
✓ Correct straight line drawn (see below)

Q1 · ● Developing · 2 marks

METHOD

Plot the points $(-1, -2)$, $(0, 0)$, $(1, 2)$... from the table.
Join them with a ruled straight line from $x = -1$ to $x = 3$.
B1 at least 3 points plotted correctly · B1 correct line

x	-1	0	1	2	3
y	-2	0	2	4	6



✓ (a) -2; (b) -2

Q2 · ● Developing · 2 marks

METHOD

Compare with $y = mx + c$: the number multiplying x is the gradient and the constant term is the y -intercept.

(a) gradient = -2 · (b) y -intercept = -2 , i.e. the point $(0, -2)$

B1 · B1

✓ Correct straight line drawn (see below)

Q3 · ● Developing · 2 marks

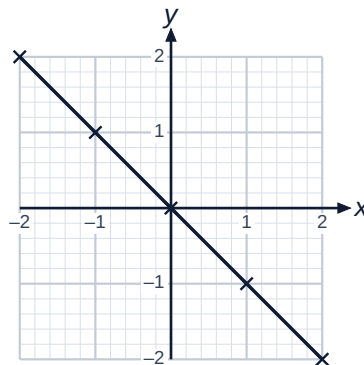
METHOD

Plot the points $(-2, 2)$, $(-1, 1)$, $(0, 0)$... from the table.

Join them with a ruled straight line from $x = -2$ to $x = 2$.

B1 at least 3 points plotted correctly · B1 correct line

x	-2	-1	0	1	2
y	2	1	0	-1	-2



✓ (7, 8)

Q4 · ● Developing · 2 marks

METHOD

$$\text{Midpoint} = ((x_1 + x_2) \div 2, (y_1 + y_2) \div 2)$$

$$= ((3 + 11) \div 2, (11 + 5) \div 2) = (7, 8)$$

B1 each coordinate

✓ Correct straight line drawn (see below)

Q5 · ● Developing · 2 marks

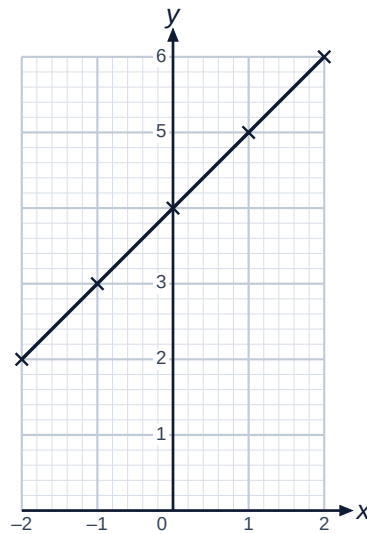
METHOD

Plot the points $(-2, 2)$, $(-1, 3)$, $(0, 4)$... from the table.

Join them with a ruled straight line from $x = -2$ to $x = 2$.

B1 at least 3 points plotted correctly · B1 correct line

x	-2	-1	0	1	2
y	2	3	4	5	6



✓ (a) 3; (b) -7

Q6 · ● Developing · 2 marks

METHOD

Compare with $y = mx + c$: the number multiplying x is the gradient and the constant term is the y -intercept.

(a) gradient = 3 · (b) y -intercept = -7, i.e. the point $(0, -7)$

B1 · B1

✓ Correct straight line drawn (see below)

Q7 · ● Developing · 2 marks

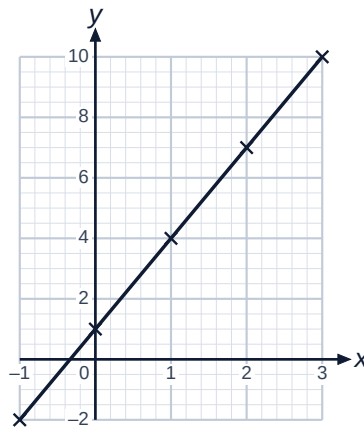
METHOD

Plot the points $(-1, -2)$, $(0, 1)$, $(1, 4)$... from the table.

Join them with a ruled straight line from $x = -1$ to $x = 3$.

B1 at least 3 points plotted correctly · B1 correct line

x	-1	0	1	2	3
y	-2	1	4	7	10



✓(3, 8)

Q8 · ● Developing · 2 marks

METHOD

Midpoint = $((x_1 + x_2) \div 2, (y_1 + y_2) \div 2)$

= $((5 + 1) \div 2, (6 + 10) \div 2) = (3, 8)$

B1 each coordinate

✓(a) 6; (b) 5

Q9 · ● Developing · 2 marks

METHOD

Compare with $y = mx + c$: the number multiplying x is the gradient and the constant term is the y -intercept.

(a) gradient = 6 · (b) y -intercept = 5, i.e. the point $(0, 5)$

B1 · B1

✓(2, 8)

Q10 · ● Developing · 2 marks

METHOD

$$\begin{aligned}\text{Midpoint} &= ((x_1 + x_2) \div 2, (y_1 + y_2) \div 2) \\ &= ((6 + (-2)) \div 2, (12 + 4) \div 2) = (2, 8)\end{aligned}$$

B1 each coordinate

✓3

Q11 · ● Secure · 2 marks

METHOD

$$\begin{aligned}\text{Gradient} &= \text{change in } y \div \text{change in } x = (7 - 19) \div (1 - 5) = -12 \div (-4) = 3 \\ \text{M1 change in } y \div \text{change in } x \cdot \text{A1}\end{aligned}$$

✓(a) 1, -1, -3; (b) line drawn (see below)

Q12 · ● Secure · 4 marks

METHOD

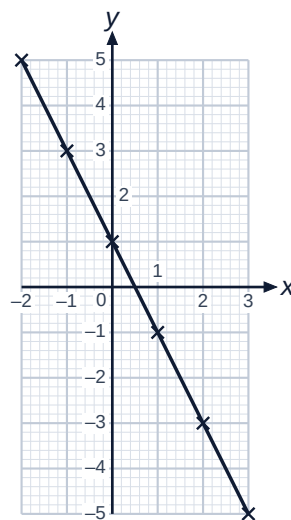
Substitute each x-value: $x = 0: y = -2 \times 0 + 1 = 1$; $x = 1: y = -2 \times 1 + 1 = -1$; $x = 2: y = -2 \times 2 + 1 = -3$

B2 all three correct (B1 for one or two)

Plot the points and join them with a ruled straight line.

B1 points plotted · B1 correct line

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



✓ (a) -2 ; (b) 2 ; (c) $y = 2x - 2$

Q13 · ● Secure · 3 marks

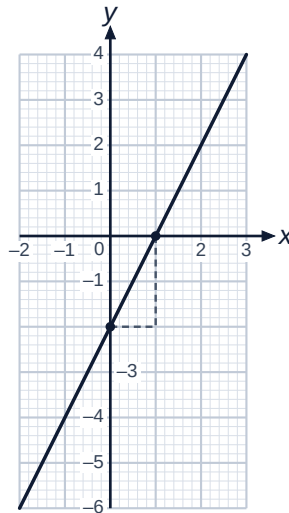
METHOD

(a) The line crosses the y -axis at $(0, -2)$

(b) From $(0, -2)$ to $(1, 0)$: up 2 for 1 across, gradient = 2

(c) $y = mx + c$ gives $y = 2x - 2$

B1 · B1 · B1 (ft their gradient and intercept)



✓2

Q14 · ● Secure · 2 marks

METHOD

Gradient = change in $y \div$ change in $x = (6 - 4) \div (5 - 4) = 2 \div 1 = 2$

M1 change in $y \div$ change in x · A1

✓3

Q15 · ● Secure · 2 marks

METHOD

Gradient = change in $y \div$ change in $x = (20 - 8) \div (4 - 0) = 12 \div 4 = 3$

M1 change in $y \div$ change in x · A1

✓ (a) -3 ; (b) -2 ; (c) $y = -2x - 3$

Q16 · ● Secure · 3 marks

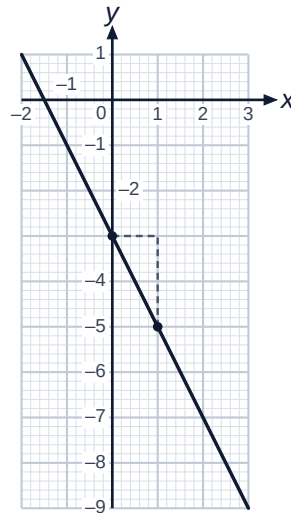
METHOD

(a) The line crosses the y -axis at $(0, -3)$

(b) From $(0, -3)$ to $(1, -5)$ down 2 for 1 across, gradient = -2

(c) $y = mx + c$ gives $y = -2x - 3$

B1 · B1 · B1 (ft their gradient and intercept)



✓ (a) 4, 0, -2; (b) line drawn (see below)

Q17 · ● Secure · 4 marks

METHOD

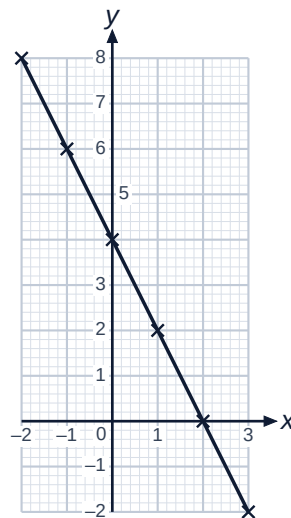
Substitute each x-value: $x = 0$: $y = -2 \times 0 + 4 = 4$; $x = 2$: $y = -2 \times 2 + 4 = 0$; $x = 3$: $y = -2 \times 3 + 4 = -2$

B2 all three correct (B1 for one or two)

Plot the points and join them with a ruled straight line.

B1 points plotted · B1 correct line

x	-2	-1	0	1	2	3
y	8	6	4	2	0	-2



✓ (a) 1, 5, 9; (b) line drawn (see below)

Q18 · ● Secure · 4 marks

METHOD

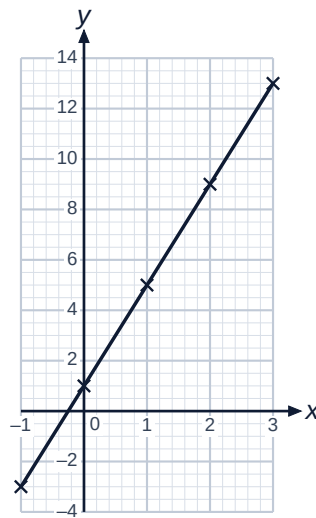
Substitute each x-value: $x = 0: y = 4 \times 0 + 1 = 1$; $x = 1: y = 4 \times 1 + 1 = 5$; $x = 2: y = 4 \times 2 + 1 = 9$

B2 all three correct (B1 for one or two)

Plot the points and join them with a ruled straight line.

B1 points plotted · B1 correct line

x	-1	0	1	2	3
y	-3	1	5	9	13



✓ (a) 2; (b) 3; (c) $y = 3x + 2$

Q19 · ● Secure · 3 marks

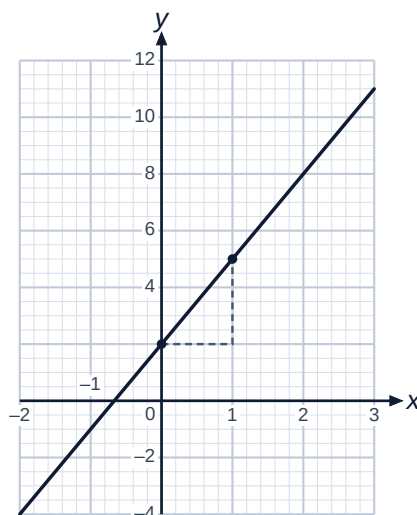
METHOD

(a) The line crosses the y-axis at (0, 2)

(b) From (0, 2) to (1, 5): up 3 for 1 across, gradient = 3

(c) $y = mx + c$ gives $y = 3x + 2$

B1 · B1 · B1 (ft their gradient and intercept)



✓ (a) -2, 1, 7; (b) line drawn (see below)

Q20 · ● Secure · 4 marks

METHOD

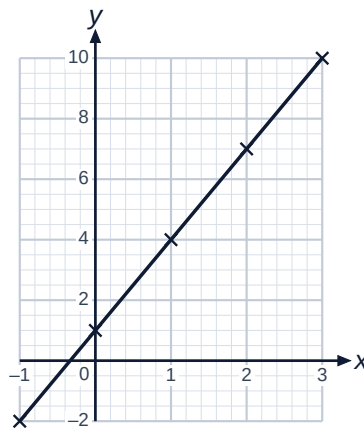
Substitute each x-value: $x = -1$: $y = 3 \times (-1) + 1 = -2$; $x = 0$: $y = 3 \times 0 + 1 = 1$; $x = 2$: $y = 3 \times 2 + 1 = 7$

B2 all three correct (B1 for one or two)

Plot the points and join them with a ruled straight line.

B1 points plotted · B1 correct line

x	-1	0	1	2	3
y	-2	1	4	7	10



✓ (a) $y = 3$; (b) $x = 2.5$; (c) -2

Q21 · ● Greater Depth · 3 marks

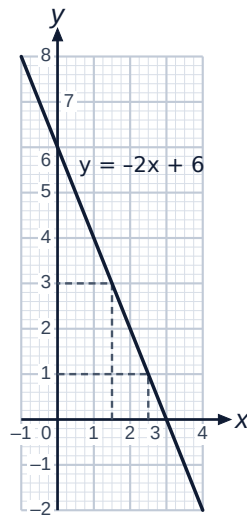
METHOD

(a) Up/down from $x = 1.5$ to the line, across to the y -axis: $y = 3$

(b) Across from $y = 1$ to the line, down to the x -axis: $x = 2.5$

(c) The gradient is the number in front of x : -2

B1 · B1 · B1



✓ $y = -2x - 8$

Q22 · ● Greater Depth · 3 marks

METHOD

Parallel lines have the same gradient, so $m = -2$

$-2 = -2 \times (-3) + c$, so $c = -8$

$y = -2x - 8$

B1 gradient · M1 substitution · A1

✓ $y = -2x + 4$

Q23 · ● Greater Depth · 3 marks

METHOD

Gradient $m = (2 - 8) \div (1 - (-2)) = -2$

Substitute $(-2, 8)$ into $y = -2x + c$: $8 = -2 \times (-2) + c$, so $c = 4$

$y = -2x + 4$

M1 gradient · M1 substitution · A1

✓ (a) (4, 6); (b) $x = 2$

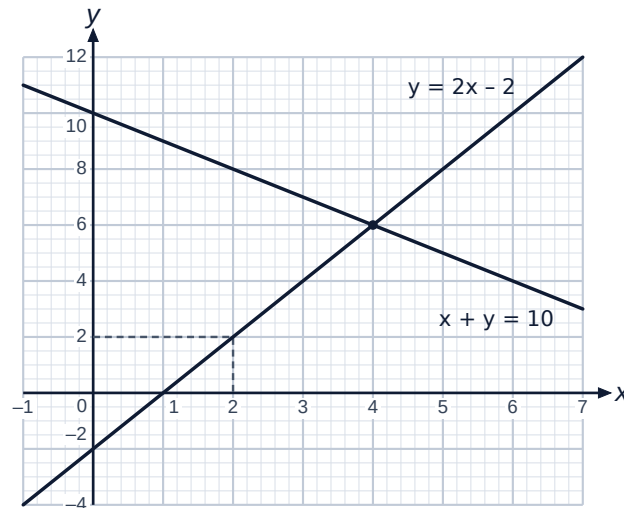
Q24 · ● Greater Depth · 3 marks

METHOD

(a) The lines cross at (4, 6)

(b) Go across from $y = 2$ to the line $y = 2x - 2$, then down to the x -axis: $x = 2$

B1 B1 part (a) · B1 part (b)



✓ $y = 5x + 10$

Q25 · ● Greater Depth · 3 marks

METHOD

Parallel lines have the same gradient, so $m = 5$

$-5 = 5 \times (-3) + c$, so $c = 10$

$y = 5x + 10$

B1 gradient · M1 substitution · A1

✓ (a) (3, 3); (b) $x = 5$

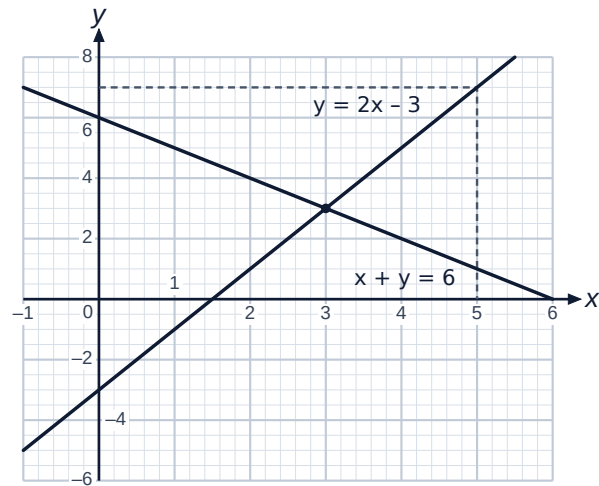
Q26 · ● Greater Depth · 3 marks

METHOD

(a) The lines cross at (3, 3)

(b) Go across from $y = 7$ to the line $y = 2x - 3$, then down to the x -axis: $x = 5$

B1 B1 part (a) · B1 part (b)



✓ (a) (4, 4); (b) $x = 6$

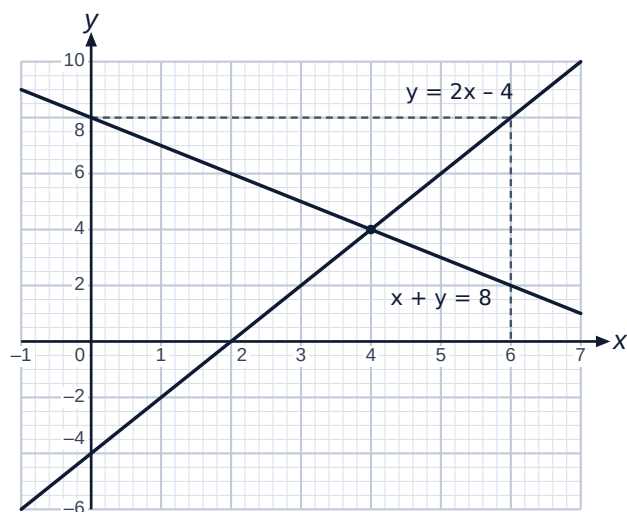
Q27 · ● Greater Depth · 3 marks

METHOD

(a) The lines cross at (4, 4)

(b) Go across from $y = 8$ to the line $y = 2x - 4$, then down to the x -axis: $x = 6$

B1 B1 part (a) · B1 part (b)



✓ (a) $y = -2$; (b) $x = 1.5$; (c) 2

Q28 · ● Greater Depth · 3 marks

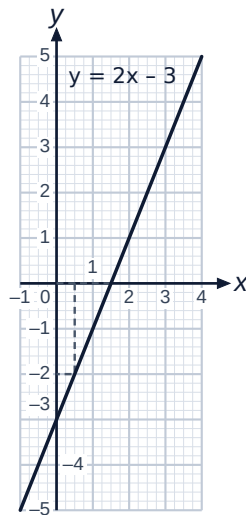
METHOD

(a) Up/down from $x = 0.5$ to the line, across to the y -axis: $y = -2$

(b) Across from $y = 0$ to the line, down to the x -axis: $x = 1.5$

(c) The gradient is the number in front of x : 2

B1 · B1 · B1



✓ (a) $y = 2$; (b) $x = 1.5$; (c) 2

Q29 · ● Greater Depth · 3 marks

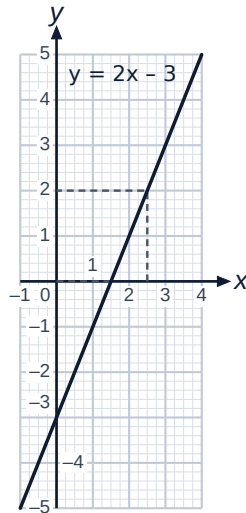
METHOD

(a) Up/down from $x = 2.5$ to the line, across to the y -axis: $y = 2$

(b) Across from $y = 0$ to the line, down to the x -axis: $x = 1.5$

(c) The gradient is the number in front of x : 2

B1 · B1 · B1



✓ $y = x - 1$

Q30 · ● Greater Depth · 3 marks

METHOD

Gradient $m = (0 - (-3)) \div (1 - (-2)) = 1$

Substitute $(-2, -3)$ into $y = x + c$: $-3 = 1 \times (-2) + c$, so $c = -1$

$y = x - 1$

M1 gradient · M1 substitution · A1