LINES OF THE FORM y = mx + c

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

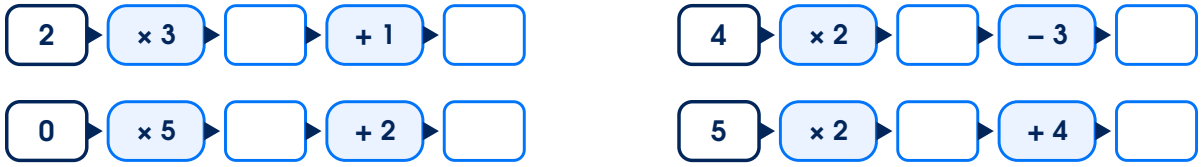
KEY IDEA

y = 2x + 1 means multiply x by 2, THEN add 1.



When x = 3, y = 7. So (3, 7) is on the line.

1 Complete the two-step function machines.



2 Complete the table of values for y = 2x + 1

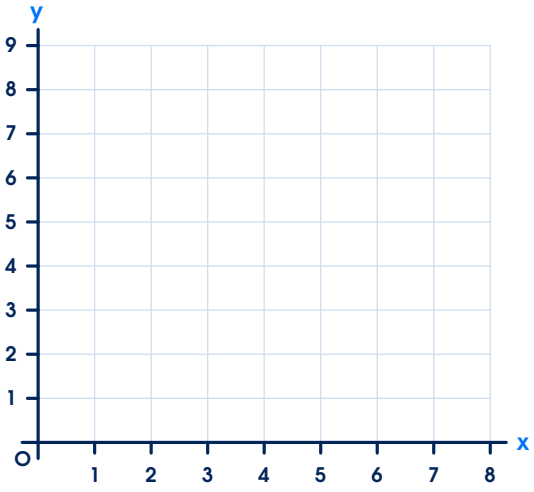
x	0	1	2	3
y	1			



3 Draw the line y = 2x + 1

Plot the points from your table in question 2. Join them with a ruler. Make the line reach the edges of the grid.

Points in a straight line? Your table is right!



4 Is each point on the line y = 2x + 1? Work it out.

a) (3, 7): 2 × 3 + 1 = ____ On the line? YES NO

b) (2, 6): 2 × 2 + 1 = ____ On the line? YES NO

LINES OF THE FORM y = mx + c

SUPPORT

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KEY IDEA

y = 3x – 1: multiply x by 3, then subtract 1.

When x = –2: y = 3 × (–2) – 1 = –6 – 1 = –7

x	–2	–1	0	1	2
y	–7	–4	–1	2	5

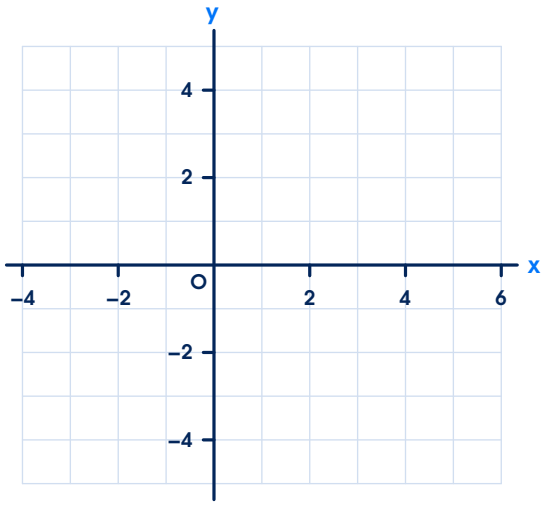
Plot at least 3 points. They should make a straight line.

1 Complete the table of values for y = 2x – 3

x	–1	0	1	2	3	4
y						

2 Draw the line y = 2x – 3

Use your table from question 1. Plot the points and join them with a ruler. Make the line reach the edges of the grid.



3 a) Complete the table of values for y = –x + 2

x	–2	–1	0	1	2	3
y						

b) Draw y = –x + 2 on the grid in question 2.

4 Ali made a table of values for y = 3x + 1. One value is wrong.

x	–1	0	1	2
y	–2	1	4	6

a) Circle the wrong value.

b) What should it be? ☐

LINES OF THE FORM y = mx + c

CORE

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KEY IDEA

Substitute each x-value carefully, especially negatives and 0. Plot at least 3 points.

FLUENCY

1 Complete each table of values.

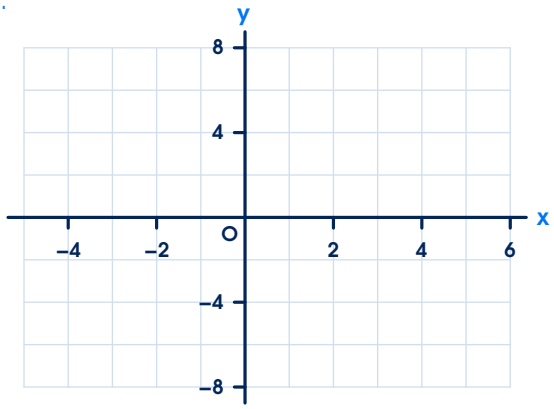
Then draw both lines on the grid. Label them a) and b).

a) $y = 3x - 2$

x	−2	−1	0	1	2	3
y						

b) $y = 4 - 2x$

x	−2	−1	0	1	2	3
y						



2 Tick the points that lie on the line $y = 5x - 3$

(2, 7)	☐	(−1, −8)	☐	(0, 3)	☐
(4, 17)	☐	(0.5, −0.5)	☐		

REASONING

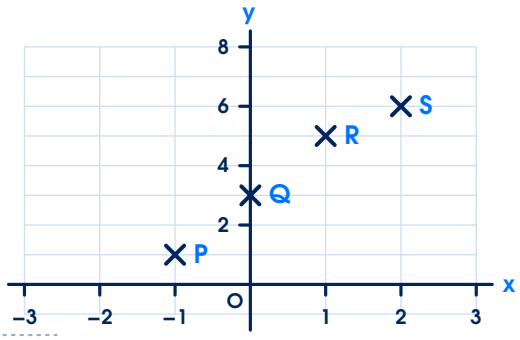
3 Look at the plotted points.

Kim plotted points P, Q, R and S from her table of values for $y = 2x + 3$.

a) Which point is wrong? ☐

b) How can you tell from the graph?

.....



4 Why is it a good idea to plot at least three points when you draw a straight-line graph?

.....

.....

LINES OF THE FORM y = mx + c

GREATER DEPTH

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REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) The lines y = 3x + 1 and y = 3x – 4 are parallel. ALWAYS SOMETIMES NEVER

b) Making c bigger in y = mx + c makes the line steeper. ALWAYS SOMETIMES NEVER

c) The line y = mx + c passes through (1, m + c). ALWAYS SOMETIMES NEVER

d) The line y = mx + c has a positive gradient. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A line has the equation 2x + y = 5

a) Write it in the form y = ... ☐

b) Complete the table.

x	–1	0	1	2	3
y	☐	☐	☐	☐	☐

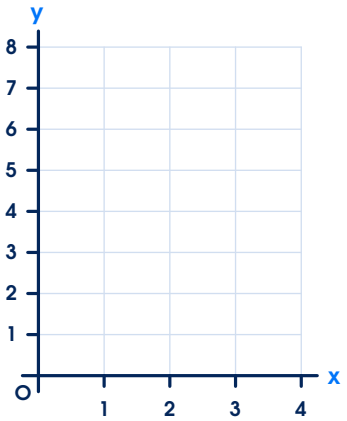
3 a) Complete both tables of values.

x	0	1	2	3
y = 2x + 1	☐	☐	☐	☐

x	0	1	2	3
y = 7 – x	☐	☐	☐	☐

b) Plot both lines on the grid.

c) The lines meet at (,)



★ CHALLENGE FOR ALL

4 A line y = mx + c passes through (0, –3) and (2, 5).

a) Find m. ☐ **b)** Find c. ☐ **c)** Is (–1, –7) on the line? ☐

LINES OF THE FORM y = mx + c

ANSWERS

BUILDING BLOCKS

1 6, 7 · 8, 5 · 0, 2 · 10, 14
2 1, 3, 5, 7
3 Straight line through (0, 1), (1, 3), (2, 5), (3, 7), extended to the edges
4 a) 7, yes · b) 5, no

SUPPORT

1 –5, –3, –1, 1, 3, 5
2 Straight line through (–1, –5) and (4, 5), crossing the y-axis at –3
3 a) 4, 3, 2, 1, 0, –1 · b) line going down, through (0, 2) and (2, 0)
4 a) 6 · b) 7 (3 × 2 + 1)

CORE

1 a) –8, –5, –2, 1, 4, 7 · b) 8, 6, 4, 2, 0, –2 · both lines drawn; they cross at (1.2, 1.6)
2 Tick (2, 7), (–1, –8), (4, 17) and (0.5, –0.5). (0, 3) is not on it: y = –3
3 a) S (2, 6) — it should be (2, 7) · b) S is not in a straight line with the other points
4 Two points always make a straight line, even if one is wrong. A third point checks the table: if the three points are not in a line, there is a mistake.

GREATER DEPTH

1 a) Always (same gradient) · b) Never: c moves the line up, the gradient stays the same · c) Always · d) Sometimes: only when m > 0
2 a) y = 5 – 2x · b) 7, 5, 3, 1, –1
3 a) 1, 3, 5, 7 and 7, 6, 5, 4 · b) both lines plotted · c) (2, 5)
4 a) m = 4 · b) c = –3 · c) Yes: 4 × (–1) – 3 = –7