Plot straight line graphs (R)

1 Here are three tables of values for the lines P, Q and R.

a) Complete the tables.

P $y = 3x + 4$

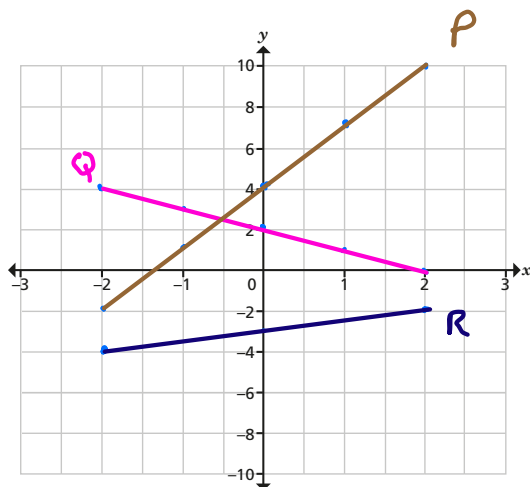| x	−2	−1	0	1	2
y	−2	1	4	7	10

Q $y = −x + 2$

x	−2	−1	0	1	2
y	4	3	2	1	0

R $y = 0.5x − 3$

x	−2	−1	0	1	2
y	−4	−3½	−3	−2½	−2

b) Plot and label lines P, Q and R.

2 a) Complete the tables of values for the four lines: L₁, L₂, L₃ and L₄

L₁ $y = 4x + 3$

x	−2	−1	0	1	2
y	−5	−1	3	7	11

L₃ $y = 3 − 4x$

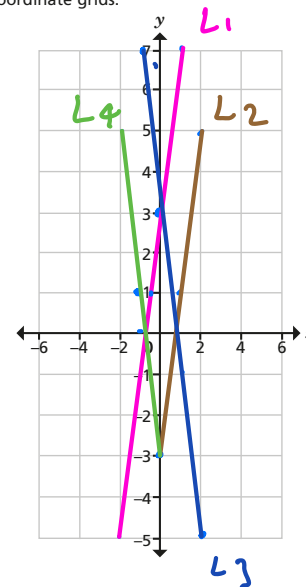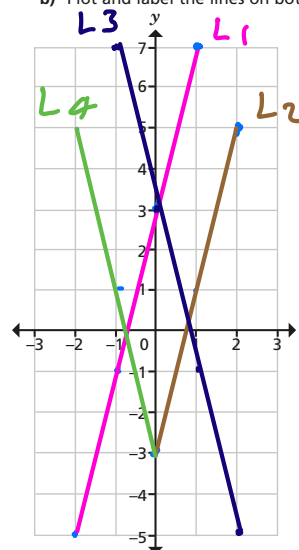| x	−2	−1	0	1	2
y	11	7	3	−1	−5

L₂ $y = 4x − 3$

x	−2	−1	0	1	2
y	−11	−7	−3	1	5

L₄ $y = −3 − 4x$

x	−2	−1	0	1	2
y	5	1	−3	−7	−11

b) Plot and label the lines on both coordinate grids.

What is the same? What is different? L₁ and L₂ are parallel
Discuss it with a partner.

L₃ and L₄ are parallel

3 a) Complete the tables of values for the four lines: J, K, L and M.

J $y = 5x + 2$

x	−2	−1	0	1	2
y	−8	−3	2	7	12

L $y = 2 − x$

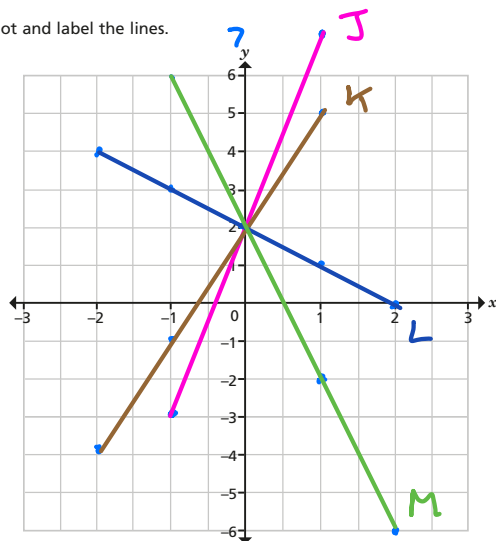| x	−2	−1	0	1	2
y	4	3	2	1	0

K $2 + 3x = y$

x	−2	−1	0	1	2
y	−4	−1	2	5	8

M $y = −4x + 2$

x	−2	−1	0	1	2
y	10	6	2	−2	−6

b) Plot and label the lines.

c) Look at the sequence formed by the y-values for each line. What do you notice?
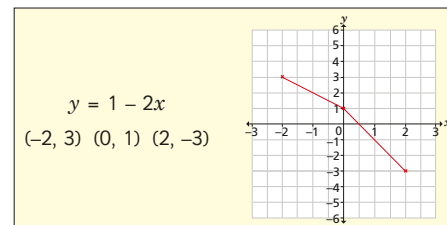
d) All the lines have exactly one point in common. What are the coordinates of this point? (0 , 2) Why does this happen?

Lines on 2nd set of axes are steeper

4 Tommy has worked out the coordinates of three points on the line $y = 1 − 2x$ and used them to draw the graph of $y = 1 − 2x$.

$y = 1 − 2x$
(−2, 3) (0, 1) (2, −3)

How can you tell by looking at the graph that Tommy must have made a mistake?

5 a) Work out the coordinates of three points on the lines T, U and V.

T $y = 2x − 5$ _____

U $3 − x = y$ _____

V $y = 4 + 3x$ _____

b) Draw and label the lines on both coordinate grids.

What is the same? What is different?

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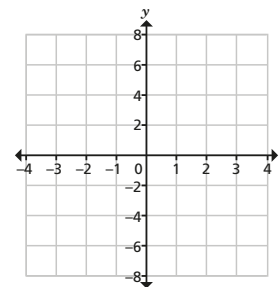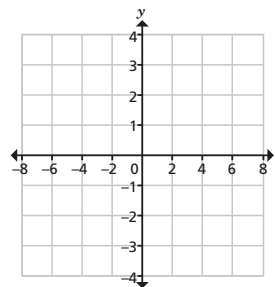
Q $y = -x + 2$

x	−2	−1	0	1	2
y	4	3	2	1	0

$x = -2 \quad y = --2 + 2$
$\qquad\qquad = +2 + 2 \quad = 4$

$x = -1 \quad y = --1 + 2$
$\qquad\qquad = +1 + 2 \quad = 3$

$x = 0 \quad y = -0 + 2 \quad = 2$

$x = 1 \quad y = -1 + 2 \quad = 1$

$x = 2 \quad y = -2 + 2 \quad = 0$

P $y = 3x + 4$

x	−2	−1	0	1	2
y	−2	1	4	7	10

$x = -2 \quad y = 3(-2) + 4 \quad = -6 + 4 \quad = -2$

$x = -1 \quad y = 3(-1) + 4 \quad = -3 + 4 \quad = +1$

$x = 0 \quad y = 3(0) + 4 \quad = 0 + 4 \quad = +4$

$x = 1 \quad y = 3(1) + 4 \quad = 3 + 4 \quad = 7$

$x = 2 \quad y = 3(2) + 4 \quad = 6 + 4 \quad = 10$

R $y = 0.5x - 3$

x	−2	−1	0	1	2
y	−4	$-3\frac{1}{2}$	−3	$-2\frac{1}{2}$	−2

$x = -2 \quad y = \frac{1}{2}(-2) - 3 = -1 - 3 = -4$

$x = -1 \quad y = \frac{1}{2}(-1) - 3 = -\frac{1}{2} - 3 = -3\frac{1}{2}$

$x = 0 \quad y = \frac{1}{2}(0) - 3 = 0 - 3 = -3$

$x = 1 \quad y = \frac{1}{2}(1) - 3 = \frac{1}{2} - 3 = -2\frac{1}{2}$

$x = 2 \quad y = \frac{1}{2}(2) - 3 = 1 - 3 = -2$

2 **a)** Complete the tables of values for the four lines: L_1, L_2, L_3 and L_4

L_1 $y = 4x + 3$

x	-2	-1	0	1	2
y	-5	-1	3	7	11

L_3 $y = 3 - 4x$

x	-2	-1	0	1	2
y	11	7	3	-1	-5

L_2 $y = 4x - 3$

x	-2	-1	0	1	2
y	-11	-7	-3	1	5

L_4 $y = -3 - 4x$

x	-2	-1	0	1	2
y	5	1	-3	-7	-11

L_1 $y = 4x + 3$

$x = -2$ $y = 4(-2) + 3 = -8 + 3 = -5$
$x = -1$ $y = 4(-1) + 3 = -4 + 3 = -1$
$x = 0$ $y = 4(0) + 3 = 0 + 3 = 3$
$x = 1$ $y = 4(1) + 3 = 4 + 3 = 7$
$x = 2$ $y = 4(2) + 3 = 8 + 3 = 11$

L_2 $y = 4x - 3$

$x = -2$ $y = 4(-2) - 3 = -8 - 3 = -11$
$x = -1$ $y = 4(-1) - 3 = -4 - 3 = -7$
$x = 0$ $y = 4(0) - 3 = 0 - 3 = -3$
$x = 1$ $y = 4(1) - 3 = 4 - 3 = 1$
$x = 2$ $y = 4(2) - 3 = 8 - 3 = 5$

L_3 $y = 3 - 4x$

$x = -2$ $y = 3 - 4(-2) = 3 + 8 = 11$
$x = -1$ $y = 3 - 4(-1) = 3 + 4 = 7$
$x = 0$ $y = 3 - 4(0) = 3 - 0 = 3$

$x = 1$ $y = 3 - 4(1) = 3 - 4 = -1$

$x = 2$ $y = 3 - 4(2) = 3 - 8 = -5$

L4 $y = -3 - 4x$

$x = -2$ $y = -3 - 4(-2) = -3 + 8 = 5$

$x = -1$ $y = -3 - 4(-1) = -3 + 4 = 1$

$x = 0$ $y = -3 - 4(0) = -3 + 0 = -3$

$x = 1$ $y = -3 - 4(1) = -3 - 4 = -7$

$x = 2$ $y = -3 - 4(2) = -3 - 8 = -11$