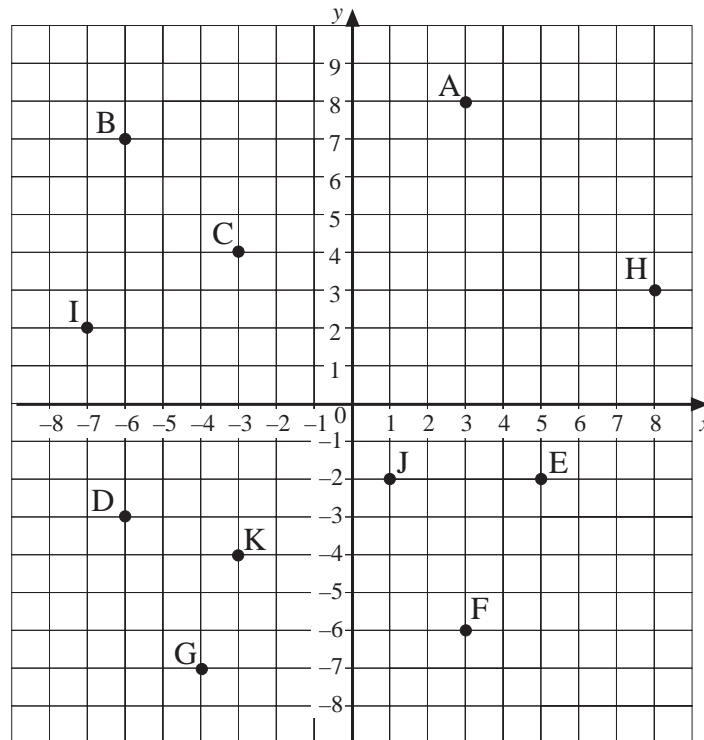


UNIT 5 *Linear Graphs and Equations* Extra Exercises 5.1

1. Write down the coordinates of each point marked on the following axes:



2. The coordinates of 3 corners, A, B, C, of a square are $(1, 5)$, $(1, -2)$ and $(-6, 5)$ respectively.
- Draw the square.
 - What are the coordinates of D, the other corner?
3. The coordinates of 3 corners, A, B, C, of a rectangle are $(-1, -2)$, $(-3, 1)$ and $(8, 4)$.
- Draw the rectangle.
 - What are the coordinates of D, the other corner of the rectangle?
4. Join the points with the following coordinates, in order.
- $(1, -1)$, $(1, -2)$, $(-3, -2)$, $(-3, -1)$, $(0, 2)$, $(-3, 2)$, $(-3, 3)$,
 $(1, 3)$, $(1, 2)$, $(-2, -1)$, $(1, -1)$

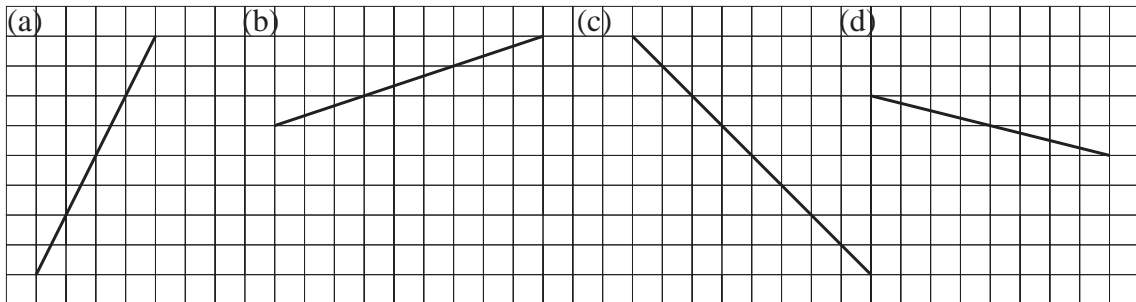
What letter have you drawn?

UNIT 5 *Linear Graphs and Equations* Extra Exercises 5.2

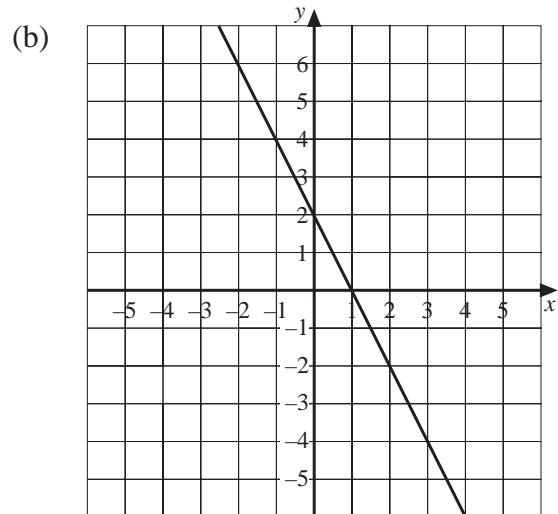
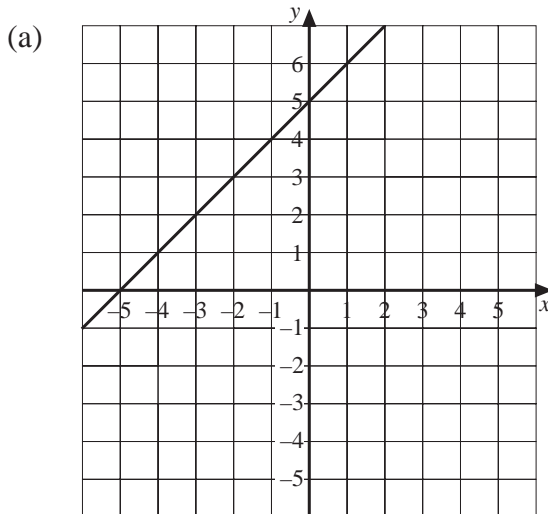
1. Copy and complete the following table for $y = 5 - 2x$, and then draw the graph with equation $y = 5 - 2x$.

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

2. Determine the *gradient* of each of the following lines:



3. Determine the *equation* of each of the following lines:



4. Copy and complete the following table:

<i>Equation of Line</i>	<i>Gradient</i>	<i>Intercept</i>
$y = 4x + 2$		
$y = 8x - 2$		
	4	3
	2	9

UNIT 5 *Linear Graphs and Equations* **Extra Exercises 5.3**

1. Solve the following equations:

(a) $x - 7 = 22$ (b) $x + 8 = 14$ (c) $5x = 30$

(d) $\frac{x}{2} = 16$ (e) $x - 9 = 11$ (f) $x + 8 = 60$

(g) $\frac{x}{4} = 3$ (h) $7x = 21$ (i) $4x = 90$

2. Solve the following equations:

(a) $3x + 2 = 17$ (b) $11x - 8 = 25$ (c) $4(x + 2) = 20$

(d) $6x - 7 = 23$ (e) $11(x - 7) = 44$ (f) $\frac{x}{3} - 7 = 11$

(g) $16x - 4 = 140$ (h) $5(x + 3) = 55$ (i) $\frac{1}{4}(x - 3) = 13$

3. (a) Draw the graph of $y = 2x + 1$ and the graph of $y = 7 - x$.

(b) Use your graph to write down the solution to the equation

$$2x + 1 = 7 - x$$

4. (a) Draw the lines with equations

$$y = 3x - 1 \text{ and } y = x + 5$$

(b) Write down the solution to the equation

$$3x - 1 = x + 5$$

UNIT 5 *Linear Graphs and Equations* Extra Exercises 5.4

1. (a) Draw the line with equation $y = x + 1$.
- (b) Draw a parallel line that passes through the point with coordinates $(0, 4)$.
- (c) Write down the equation of the parallel line.

2. The equations of 5 lines are listed below:

A $y = 6x - 2$

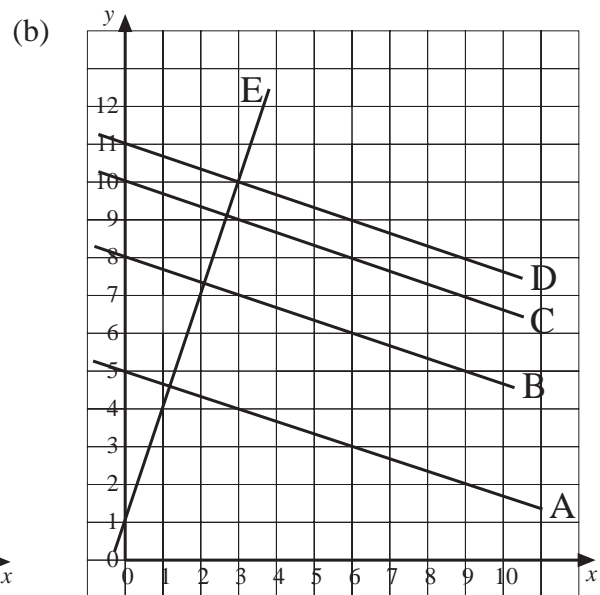
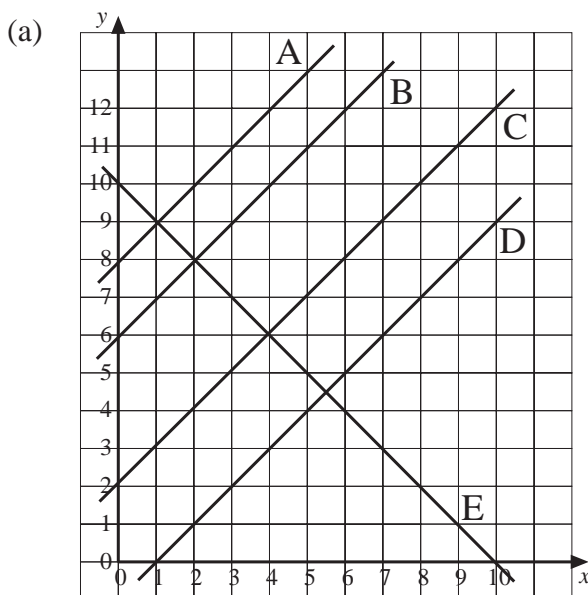
B $y = 2x - 6$

C $y = 2x + 6$

D $y = 6x + 2$

E $y = -\frac{1}{2}x + 6$

- (a) Which line is parallel to A?
- (b) Which line is parallel to C?
- (c) Which line is perpendicular to B and C?
3. For each of the following diagrams,
- (i) Calculate the gradient and equation of the line A,
- (ii) Write down the equations of the other lines.



UNIT 5 *Linear Graphs and Equations* Extra Exercises 5.5

1. (a) Draw the lines with equations $y = 4x + 3$ and $y = 2x + 11$.
(b) Write down the coordinates of the point where the two lines cross.
(c) Write down the solution of the simultaneous equations:

$$y = 4x + 3$$
$$y = 2x + 11$$

2. Use a graph to solve the simultaneous equations:

$$x + 2y = 10$$
$$3x + y = 10$$

3. Use an algebraic method to solve the following pairs of simultaneous equations:

(a) $x + y = 12$
 $x - y = 2$

(b) $2x + 3y = 7$
 $4x - 3y = 5$

(c) $2x + y = 16$
 $x + 2y = 11$

(d) $5x + y = 19$
 $2x + 4y = 22$

(e) $2x - y = 17$
 $x + 3y = 12$

(f) $5x - 2y = 46$
 $8x + 4y = 88$

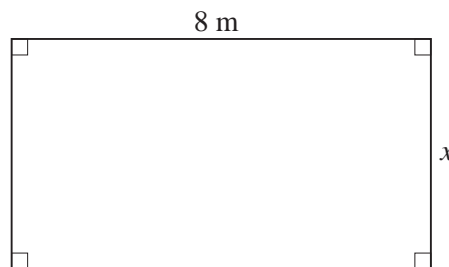
4. Ben buys 2 pencils and a pen, costing a total of 50p.
Adam buys 3 pencils and 2 pens, costing a total of 85p.

Given that $x =$ cost of a pencil and $y =$ cost of a pen, write down a pair of simultaneous equations and solve them for x and y .

UNIT 5 *Linear Graphs and Equations* Extra Exercises 5.6

1. The area of the rectangle shown is 36 m^2 .

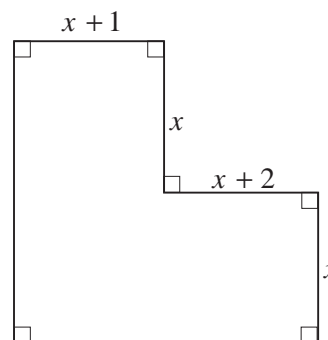
- (a) Write down an equation using this information.
 (b) Solve the equation.



2. The formula $N = 2x + 1$ is used to give odd numbers.

- (a) What is the value of N when $x = 19$?
 (b) If $N = 77$, write down an equation and solve it to find x .
 (c) What is the value of x if $N = 193$?

3. (a) Write down the perimeter, in terms of x , of the shape shown.
 (b) If the perimeter is 94 cm, determine the value of x .



4. The cost of hiring a concrete mixer is £25, plus £6 per day.

- (a) Write down a formula for the cost of hiring the concrete mixer for n days.
 (b) The concrete mixer is hired for n days at a total cost of £67. Write down an equation and solve it to obtain n .

5. Two consecutive multiples of 7 are added together.

- (a) If the first multiple is $7n$, what is the second multiple?
 (b) If the two multiples added together give 301, determine the value of n .

Extra Exercises 5.1 Answers

1. A (3, 8) G (-4, -7)
 B (-6, 7) H (8, 3)
 C (-3, 4) I (-7, 2)
 D (-6, -3) J (1, -2)
 E (5, -2) K (-3, -4)
 F (3, -6)
2. (b) (-6, -2)
3. (b) (6, 7)
4. Z

Extra Exercises 5.2 Answers

1.

<i>x</i>	-2	-1	0	1	2	3	4	5
<i>y</i>	9	7	5	3	1	-1	-3	-5
2. (a) 2 (b) $\frac{1}{3}$ (c) -1 (d) $-\frac{1}{4}$
3. (a) $y = x + 5$ (b) $y = -2x + 2$
4.

<i>Equation of Line</i>	<i>Gradient</i>	<i>Intercept</i>
$y = 4x + 2$	4	2
$y = 8x - 2$	8	-2
$y = 4x + 3$	4	3
$y = 2x + 9$	2	9

Extra Exercises 5.3 Answers

1. (a) $x = 29$ (b) $x = 6$ (c) $x = 6$
 (d) $x = 32$ (e) $x = 20$ (f) $x = 52$
 (g) $x = 12$ (h) $x = 3$ (i) $x = 22\frac{1}{2}$
2. (a) $x = 5$ (b) $x = 3$ (c) $x = 3$
 (d) $x = 5$ (e) $x = 11$ (f) $x = 54$
 (g) $x = 9$ (h) $x = 8$ (i) $x = 55$
3. (b) $x = 2$
4. (b) $x = 3$

Extra Exercises 5.4 Answers

1. (c) $y = x + 4$
2. (a) D (b) B (c) E
3. (a) A $y = x + 8$ (b) A $y = -\frac{1}{3}x + 5$
 B $y = x + 6$ B $y = -\frac{1}{3}x + 8$
 C $y = x + 2$ C $y = -\frac{1}{3}x + 10$
 D $y = x - 1$ D $y = -\frac{1}{3}x + 11$
 E $y = 10 - x$ E $y = 3x + 1$
 or $y = -x + 10$

Extra Exercises 5.5 Answers

1. (b) (4, 19) (c) $x = 4, y = 19$
2. $x = 2, y = 4$
3. (a) $x = 7, y = 5$ (b) $x = 2, y = 1$
 (c) $x = 7, y = 2$ (d) $x = 3, y = 4$
 (e) $x = 9, y = 1$ (f) $x = 10, y = 2$
4. $2x + y = 50$ $x = 15, y = 20$
 $3x + 2y = 85$

Extra Exercises 5.6 Answers

1. (a) $8x = 36$ (b) $x = 4.5$ m
2. (a) $N = 39$ (b) $77 = 2x + 1, x = 38$
 (c) $x = 96$
3. (a) $8x + 6$ (b) $x = 11$
4. (a) $25 + 6n$ (b) $67 = 25 + 6n, n = 7$
5. (a) $7n + 7$ (b) $14n + 7 = 301, n = 21$