

Graphs from linear equations

Year 7 About 70 minutes No calculator 46 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-graphs-from-linear-equations/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
 Work out the value of $2x - 3$ when $x = -2$.
 Solve $3y + 2 = 14$.

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 2 [1 mark]
 A prism has a cross-section of area 18 cm^2 and a length of 7 cm .
 Work out its volume.
 The point $(2, -1)$ is moved 3 units left and 4 units up. Write down its new coordinates.

Answer

Answer

B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1Complete the table for $y = 2x + 5$. Then draw the graph.

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

Hint Double each x first, then add 5.

- B1** Complete the table for [2 marks]
 $y = 3x - 1$.

x	-1	0	1	2	3
$3x$		0			
$y = 3x - 1$		-1			

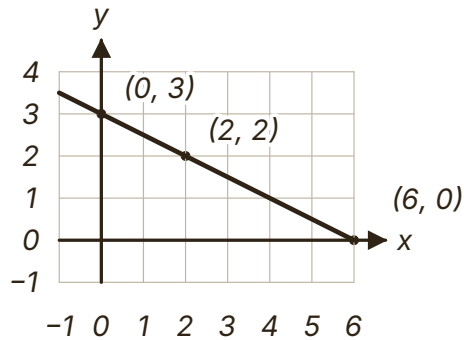
EXAMPLE 2Do the points $(4, 9)$ and $(-1, -5)$ lie on the line $y = 3x - 2$?**Hint** Put the x of the point into the equation and see if you get its y .

- B2** Which of the points $(2, 1)$, [2 marks]
 $(-3, 11)$ and $(5, -8)$ lie on the line $y = 5 - 2x$?

Answer

EXAMPLE 3

Find where the line $2y + x = 6$ crosses each axis, and the point on it where $x = 2$. Draw the line.



Hint On the y -axis $x = 0$. On the x -axis $y = 0$.

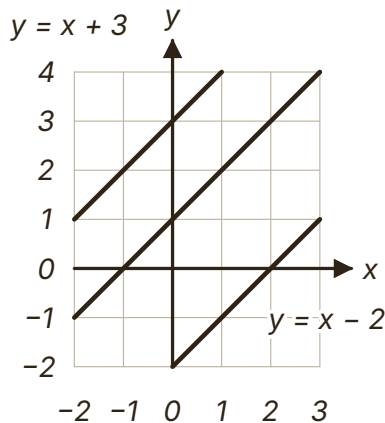
B3 Find where the line [3 marks]

$4y + 3x = 12$ crosses each axis, and the point on it where $x = 8$.

Answer

EXAMPLE 4

The grid shows $y = x + 3$, $y = x + 1$ and $y = x - 2$. What is the same about the three lines? Where will $y = x + 5$ cross the y -axis?



Hint Look at the number after the x , and where each line meets the y -axis.

B4 Which of these lines are [2 marks]

parallel to $y = 2x + 1$? Write down where each of those crosses the y -axis.

$$y = 2x - 4 \quad y = x + 1 \quad y = 2x + 6$$

Answer

C Practice

Year 7

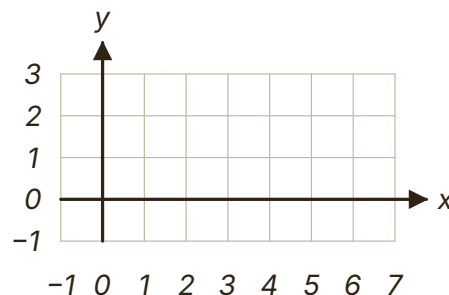
C1 Complete the table for $y = 7 - x$.

[2 marks]

x	-1	0	2	4	6	8
$y = 7 - x$						

C2 Draw the line $x + 3y = 6$ on the grid. Use the points where it crosses the axes.

[3 marks]



C3 These lines are $y = x$, $y = 3x$, $y = \frac{1}{2}x$ and $y = 5x$. (i) Which point do all four pass through? (ii) Which line is the steepest? (iii) Which line passes through (6, 3)?

[3 marks]

C4 Where does the line $y = 3x - 6$ cross (i) the y -axis, (ii) the x -axis?

[2 marks]

Answer

Answer

D Exam-style questions

GCSE Foundation

D1 Amira says that the line $2y + 5x = 10$ crosses the x -axis at the point (5, 0).

[3 marks]

Amira is wrong. Explain her mistake, and write down where the line does cross the x -axis.

Answer (.....,.....)

D2 The points $(k, 13)$ and $(-2, m)$ lie on the line $y = 4x - 3$.

(a) Work out the value of k .

[2 marks]

Answer

(b) Work out the value of m .

[1 mark]

Answer

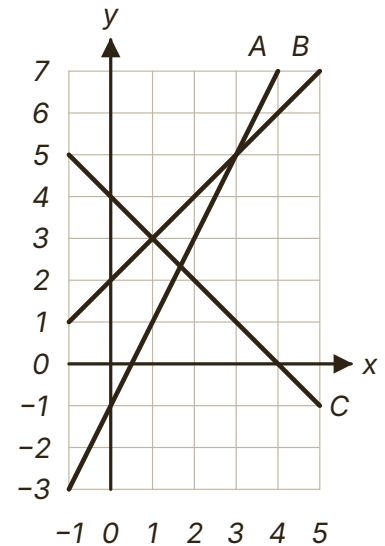
Total for D2: 3 marks

D3 Three lines A , B and C are drawn on the grid. Match each line to its equation.

[3 marks]

$y = x + 2$ $y = 4 - x$ $y = 2x - 1$

Answer



D4 This question is about the line $y = 4 - 2x$.

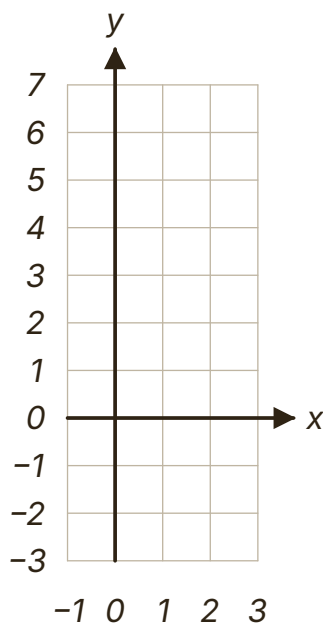
(a) Complete the table of values.

[2 marks]

x	-1	0	1	2	3
y		4			

(b) On the grid, draw the graph of $y = 4 - 2x$ for values of x from -1 to 3 .

[2 marks]



(c) Use your graph to find the value of x when $y = -1$.

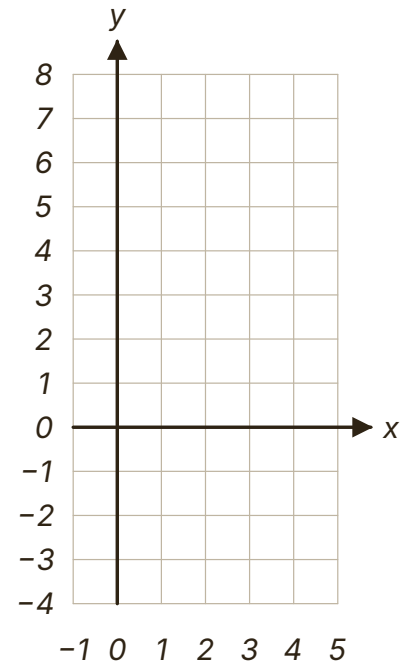
[1 mark]

Answer

Total for D4: 5 marks

- D5** On the grid, draw the lines $y = x + 1$ and $y = 7 - 2x$. Write down the coordinates of the point where they cross. [5 marks]

Answer (.....,.....)



E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** The line $ay + 2x = 18$ passes through the point $(3, 4)$. Work out the value of a . [4 marks]
Then find where the line crosses the y -axis.

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** The point $(3, 4)$ is on the line, so $x = 3$ and $y = 4$ make the equation true.
Hint 2 $4a + 6 = 18$, so $4a = 12$.
Hint 3 $a = 3$. On the y -axis $x = 0$, so $3y = 18$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can complete a table of values and draw a straight-line graph.



I can draw a line from the points where it crosses the axes.



I can test whether a point lies on a line.



I can tell from their equations which lines are parallel.

