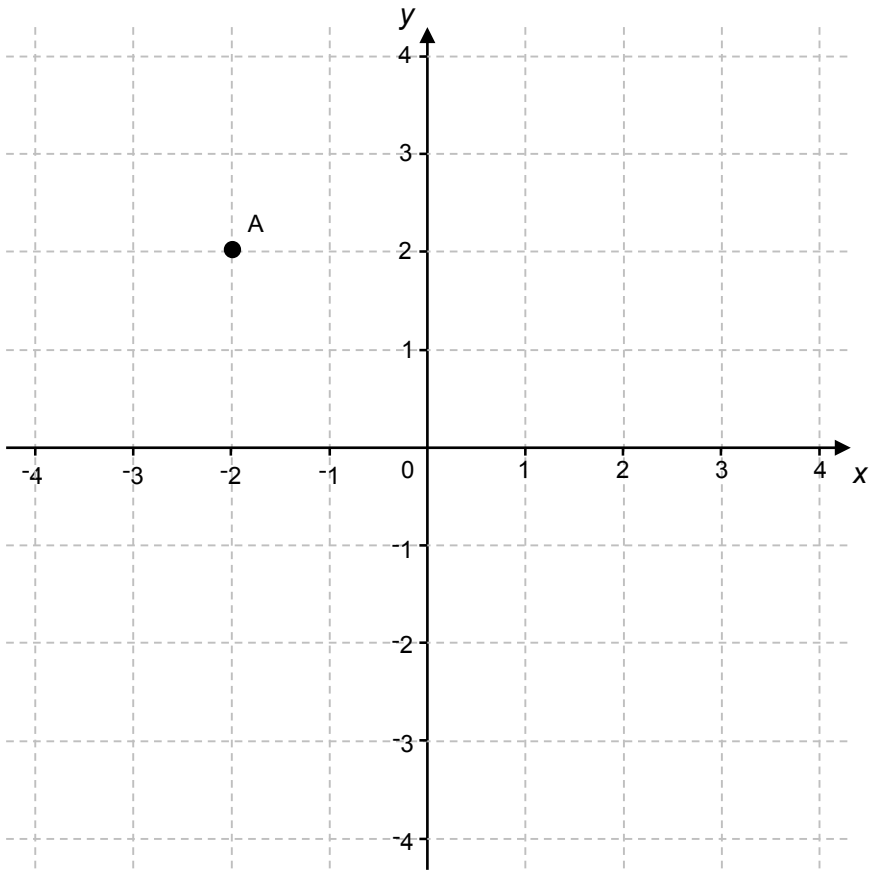
Topic Check In - 7.01 Graphs of equations and functions



1. State the coordinates of point A, shown on the grid above.
2. Plot (3, $^{-}$1) on the grid above and label it B.
3. Draw the line $x = 2$ on the grid above.
4. Draw the line $y = {}^{-}3$ on the grid above.
5. Toni sketches $y = 2x$, $y = 3x$, $y = 4x$… up to $y = 10x$ on the same grid.
   What point do all the lines pass through?
6. Explain where the lines $x = 3$ and $y = 2$ cross.

7. Harry has completed this table of values for $y = x^2$ but he has made some errors.
Explain the mistakes that Harry has made.

x	-2	-1	0	1	2
y	-4	-1	0	1	4

8. Explain what the number pattern in this table of values tells you about the shape of the graph.

x	-2	-1	0	1	2
y	-10	-6	-2	2	6

9. The table of values below is for the straight line graph $y = 2x + c$.
Work out the missing values.

x	-4		0	3
y		-5	-3	

10. The lines $x = 3$ and $y = x$ form two sides of a triangle with an area of 8 units^2. Find an equation for the third side of the triangle.

[Area of a triangle $= \frac{1}{2} \times$ base $\times$ height]

Extension

Explain clearly why the lines $y = 3x + 1$ and $y = 3x - 2$ never meet. Find other pairs of lines which never meet.

Answers

1. $(^{-}2, 2)$

2. Correctly plot $x = 3$, $y = {}^{-}1$

3. Correctly draw the vertical line $x = 2$ [goes through the points $(2, {}^{-}1)$, $(2, 0)$, $(2, 1)$ etc].

4. Correctly draw the horizontal line $y = {}^{-}3$ [goes through the points $({}^{-}1, {}^{-}3)$, $(0, {}^{-}3)$, $(1, {}^{-}3)$ etc].

5. Passes through the origin (0, 0) [because the *y*-intercept is zero in each case].

6. All the points on the line $x = 3$ have an *x*-coordinate of 3.
   All the points on the line $y = 2$ have a *y*-coordinate of 2.
   The lines therefore cross at (3, 2).

7. Harry has worked out $^{-}(2)^2 = -4$ but it should be $(^{-}2)^2 = 4$
   Harry has worked out $^{-}(1)^2 = -1$ but it should be $(^{-}1)^2 = 1$

8. As the *x* values go up by 1, the *y* values go up by 4 which gives a linear pattern so the graph will be a straight line.

9. $(0, {}^{-}3)$ is the *y*-intercept so the equation of the line is $y = 2x - 3$ and the missing values are $^{-}11$, $^{-}1$, 3.

10. A sketch of $x = 3$ and $y = x$ can be used to identify the line $y = {}^{-}1$ as the third side of the right-angled triangle so that $\frac{1}{2}bh = 8$ units^2.

Extension

Both equations have the same gradient so they are parallel. Any pair of lines in the form $y = mx + c$ where m is the same will be parallel.

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GCSE (9–1) MATHEMATICS

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AO1	1	Use correct notation to define points on a coordinate grid.			
AO1	2	Plot points on a coordinate grid.			
AO1	3	Draw vertical lines defined by x =.			
AO1	4	Draw horizontal lines defined by y =.			
AO1	5	Sketch the graphs of simple linear functions and identify the y-intercept.			
AO2	6	Identify a point of intersection of 2 lines.			
AO2	7	Generate a table of values for a quadratic function such as $y = x^2$.			
AO2	8	Recognise a linear sequence in a table of values.			
AO3	9	Generate a table of values for a simple linear function.			
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