Year 8- Representations – Working in the Cartesian Plane

Essential knowledge

- Label and identify lines parallel to the axes
- Recognise and use basic straight lines
- Identify positive and negative gradients
- Link linear graphs to sequences
- Plot y = mx + c graphs

Key Vocabulary

Quadrant: four quarters of the coordinate plane.
Coordinate: a set of values that show an exact position.
Horizontal: a straight line from left to right (parallel to the x axis)
Vertical: a straight line from top to bottom (parallel to the y axis)
Origin: (0,0) on a graph. The point the two axes cross
Parallel: Lines that never meet
Gradient: The steepness of a line
Intercept: Where lines cross

Prior learning links

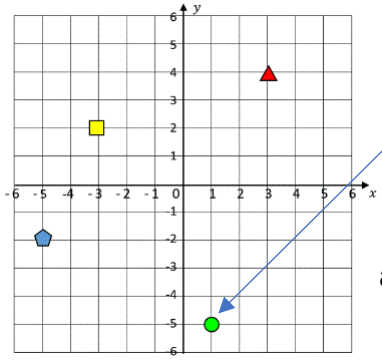
Position and Direction (Y6)
Algebraic Notation and Substitution (Y7)

Co-Ordinates in Four Quadrants

(x, y)

Always position on the x-axis first

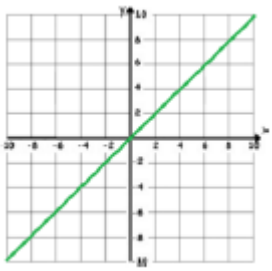
Position on the y-axis second



(1, -5)

From the origin we moved 1 square in the x axis and negative 5 in the y axis

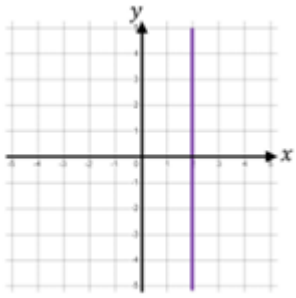
Recognise and Use the Line $y = x$



Co-Ordinates on this line:
(3,3)
(20,20)
(0,0)
(-5, -5) etc.

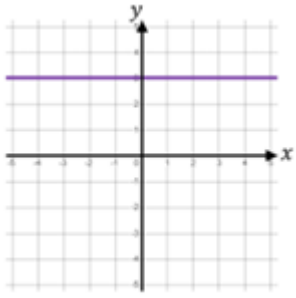
This means that the x co-ordinates and y co-ordinates on this line are always equal.

Lines Parallel to the Axes



All lines parallel to the y-axis take the form $x = a$

x = 2
All points on this line have an x co-ordinate of 2
(2,5), (2,0), (2,-3) etc.



All lines parallel to the x-axis take the form $y = a$

y = 3
All points on this line have a y co-ordinate of 3
(-4,3), (0,3), (2,3) etc.

Plot Lines in the form $y = mx + c$

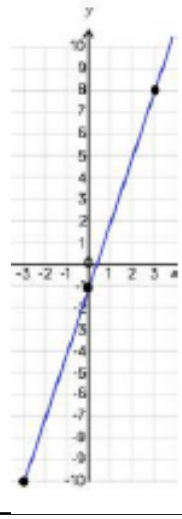
Line Equation: $y = 3x - 1$
(This means the y co-ordinate can be found by multiplying the x co-ordinate by 3 then subtracting 1)

Generate the co-ordinates in a table

x	-3	0	3
y	-10	-1	8

* we need a minimum of 2 co-ordinates but we can be more accurate by generating more

Plot the points and join with a ruler through the graph



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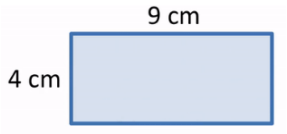
Prior learning links

Find the area and perimeter of this shape:



Calculate:

0.5 x 12 x 8 =

15^2=

Key Vocabulary

Define the following key words:

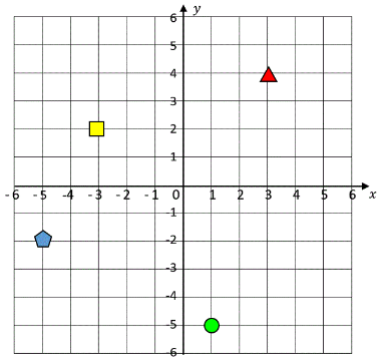
Origin –

Parallel –

Co-Ordinate –

Co-Ordinates in Four Quadrants

What are the four co-ordinates denoted by the shapes on this set of axes?



Triangle:

Square:

Circle:

Pentagon:

Using the line $y = x$

Decide which of these co-ordinates lies on the line $y = x$
Give reasons for your answer.

(1,1)

(-1,1)

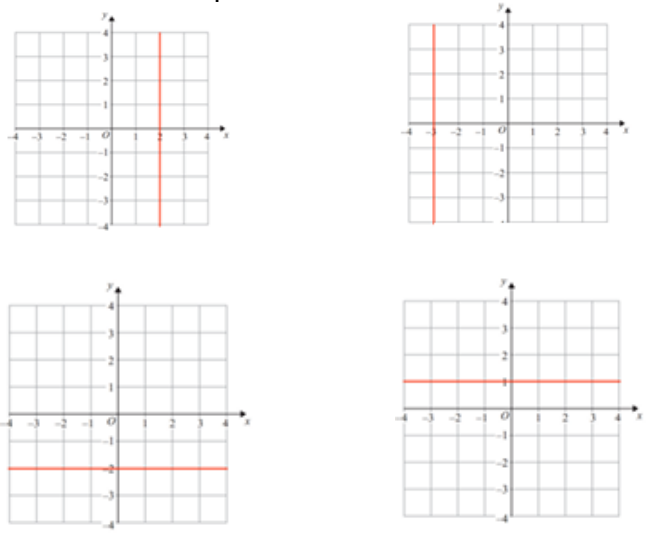
(3,-3)

(4,5)

(-0.5, $-\frac{1}{2}$)

Lines Parallel to the Axes

Write down the equations of the following graphs



Plotting lines in the form $y = mx + c$

Generate co-ordinates for the line:

$y = 2x - 4$

x	-2	-1	0	1	2	3
y						

Plot these points on the graph below.