

## What do I need to be able to do?

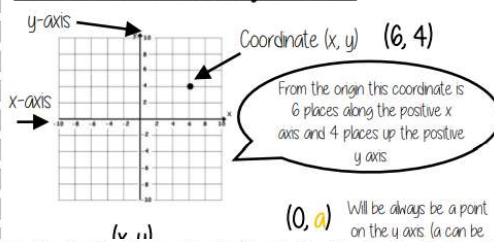
By the end of this unit you should be able to:

- 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

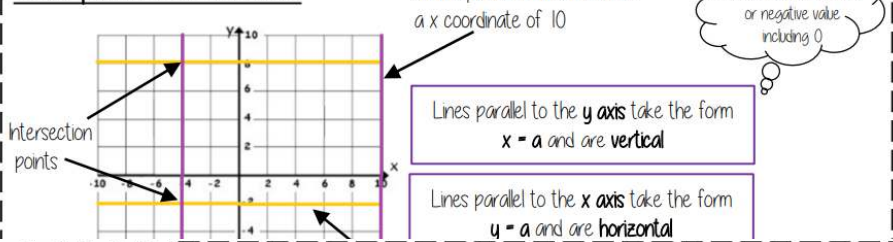
## Keywords

- 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

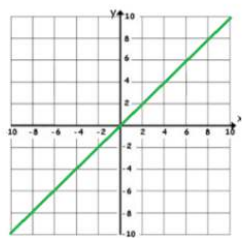
## Coordinates in four quadrants



## Lines parallel to the axes



## Recognise and use the line $y=x$



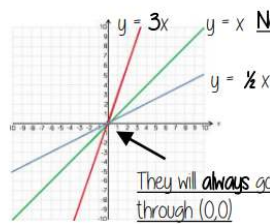
Examples of coordinates on this line: (0, 0) (-3, -3) (8, 8)

The axes **scale is important** – if the scale is the same  $y = x$  will be a straight line at  $45^\circ$

This means the x and the y coordinate have the same value

## Recognise and use the lines $y=kx$

The value of  $k$  changes the steepness of the line

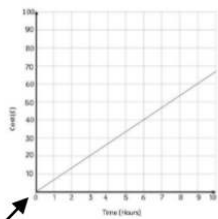


Note:  $y=x$  is the same as  $y=1x$

The bigger the value of  $k$  the **steeper** the line will be.

The closer to 0 the value of  $k$  the closer the line will be to the x axis.

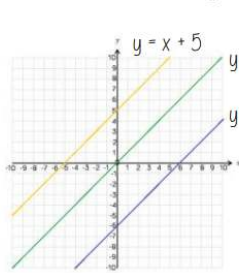
## Direct Proportion using $y=kx$



The line must be straight to be directly proportional – variables increase at the same rate  $k$

Direct proportion graphs always start at (0,0) as they are describing relationships between two variables

## Lines in the form $y = x + a$



All the lines are parallel because the gradients are the same

This is the line  $y=x$  when the y and x coordinate are the same

This shows the translation of that line  
eg  $y = x + 5$   
Is the line  $y=x$  moved 5 places up the graph

5 has been added to each of the x coordinates

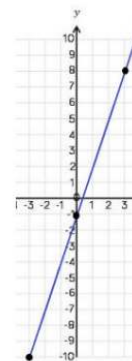
## Plotting $y = mx + c$ graphs

$y = 3x - 1$  → 3 x the x coordinate then - 1

x	-3	0	3
y	-10	-1	8

Draw a table to display this information

This represents a coordinate pair (-3, -10)

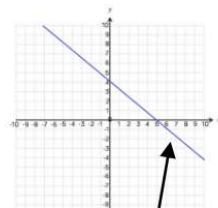


You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

Remember to join the points to make a line

## Lines with negative gradients



Any straight-line graph with a negative x value has a negative gradient

Eg  $y = -2x$   
 $y = -x$   $y + x = 12$

Direction of all negative gradients