Sketching Graphs

Once data has been collected it is useful to plot the data so that any patterns that exist between the data can be easily visualised.

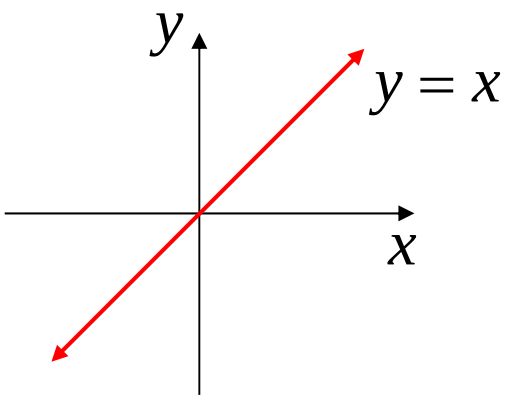
The type of pattern is determined by the shape of the data; if it can be approximated by a known function, then analysis of the data becomes easier and predictions can be made.

When plotting data a consistent scale is required so that the pattern does not lead to incorrect conclusions.

Known functions can easily be sketched from key pieces of data;

* y intercept occurs when $x = 0$
* x intercept occurs when $y = 0$
* once the intercepts have been found, curves are easy to sketch, if you know the basic shape.
* specific features unique to a type of function can be determined from its equation
* if in doubt use a table of values and plot some points

Linear Function



Any data that demonstrates **direct variation** will lie on a straight line.

Its function is known as the **linear function**.

Data that can be represented with a **line of best fit** can be approximated with a linear function

All straight lines can be transformed from the basic equation $y = x$ using translations, rotations, reflections or a combination of all three.

Recognising the linear function

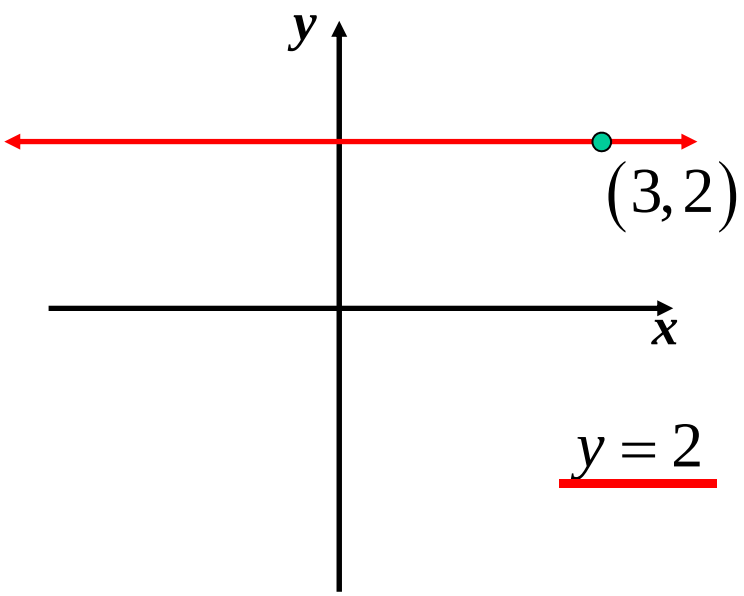
$$y = mx + b$$

power '1' (on x) power '1' (on y)

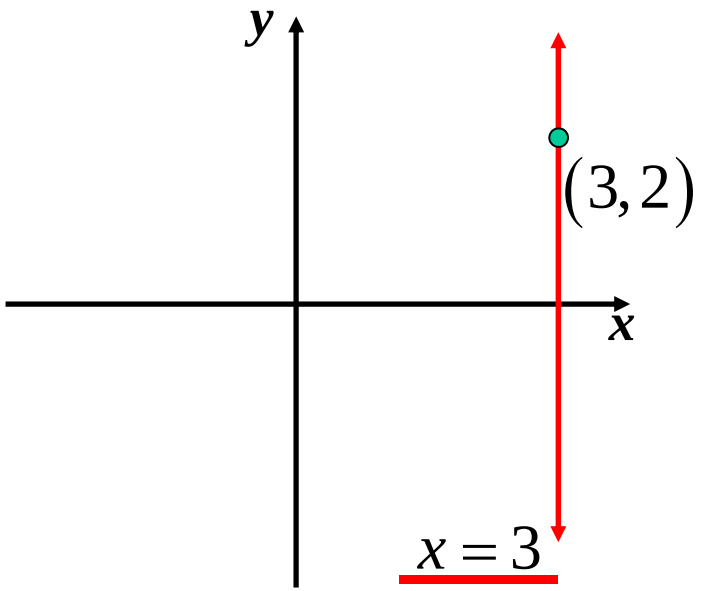
- terms contain at most one variable, all variables are to the power of one
- when expressed with the dependent variable is the subject

m = slope	b = y intercept

Note: lines parallel to the x axis ($y = c$)



lines parallel to the y axis ($x = k$)



e.g. Show that (2,4) lies on the line $x + y = 6$

$$(2,4): x + y = 2 + 4$$

$$= 6$$

$\therefore$ $(2,4)$ lies on the line $x + y = 6$

"***Show that***" questions can be solved by substituting the given information into the expression, and all of its conditions, and show that the expression is true.

Exercise 3C; 2, 6ef, 9bef, 10, 12, 13