# *Linear Equations* Essential information

***Simplifying expressions***

This means collecting like terms together;

e.g. $2x + 5 + 3x - 4 - x = 4x + 1$

***Removing brackets***

Multiplying through an expression to remove the brackets;

e.g. $4(5 - 2x) = 4 \times 5 + 4 \times (-2x) = 20 - 8x$

Note that, in general, $a(x + b) = ax + ab$ when $a$ and $b$ are any numbers.

***Equation***

This relates an unknown quantity to known quantities, and can be solved to find the value of the unknown quantity: this is called the *solution*.

e.g. $4x + 1 = 9$ (take 1 from both sides)

$4x = 9 - 1$

$4x = 8$ (divide both sides by 4)

$x = \frac{8}{4}$

i.e. $x = 2$

So $x = 2$ is the solution of the equation $4x + 1 = 9$.

***Balancing equations***

For any equation, the right hand side (RHS) must equal the left hand side (LHS) and any operation you do to one side must be done to the other side (see example above).