Maths Knowledge Organiser
Year 7 Algebra

Simplify by collecting like terms

Like terms are terms who's variable (letter) are the same

These are like terms $\rightarrow e \quad 5e \quad -3e \quad \frac{2}{3}e$

These are **not** like terms $\rightarrow 6t \quad t^2 \quad 5ty \quad 8y$

To simply identify and collect

$4a + 7b - a - 3b \equiv 3a + 4b$

$5a^2 - 3a - 4 + a \equiv 5a^2 - 2a - 4$

Expanding brackets

This is the process to remove brackets by multiplying – use the grid method to help

$5r(3r - 6) \rightarrow$
$= 15r^2 - 30r$

$\times$	$3r$	-6
$5r$	$15r^2$	$-30r$

$(3x + 2)(2x - 5) \rightarrow$
$= 6x^2 - 11x - 10$

$\times$	$2x$	-5
$3x$	$6x^2$	$-15x$
$+2$	$+4x$	-10

Substitution

Means to swop a unknown (letter) for a numerical value.

If a = 4 b = -2 and c= 0.5

7a = 7x(4) = 28

a + b = 4 + -2 = 2

abc = 4 x -2 x 0.5 = -4

Solving equations

Use inverse operations (opposites) and balancing to find the value of the unknown (letter)

$3(2x + 5) = 45$
Expand → $6x + 15 = 45$ ← Expand
-15 → $6x = 30$ ← -15
÷6 → $x = 5$ ← ÷6

Expression, equations, formula and identities

A formula is a rule written using symbols that describe a relationship between different quantities. Typical maths formulae include

An expression is a group of mathematical symbols representing a number or quantity. Expressions never have equality or inequality signs like =, >, <, ≠ ,≥ ,≤. Some examples

An identity is an equation that is always true, no matter what values are chosen.

An equation is a mathematical statement that shows that two expressions are equal. It always includes an equals sign.

Factorising – single bracket

This is the process to putting brackets into expressions, find the highest common factors first

HCF of $6x$ and 10 is 2
HCF of $12x$ and $4xy$ is $4x$
HCF of $10t^2$ and $15tr$ is $5t$

Place the HCF on the outside and divide to calculate inside

$10t^2 + 15t = 5t(2t + 3)$
$12x + 4xy = 4x(3 + y)$