

Level 4: Algebra 2

1) Learn how to multiply out brackets, for example: -

$$3(x + 2) = 3x + 6$$

$3(x + 2)$ means "three times $(x + 2)$ "
i.e. $x + 2 + x + 2 + x + 2$.

$$4(2x - 3y - 4z) = 8x - 12y - 16z$$

Notice how each term in the brackets is multiplied by the number in front of the brackets.

$$a(a + b) = a^2 + ab$$

A bracket can also be multiplied by a letter.

$$2p(3p - 4q) = 6p^2 - 8pq$$

A bracket can be multiplied by a letter and a number.

2) Learn how to multiply out brackets and then simplify, for example: -

$$\begin{aligned} &4(2x + 1) + 3(3x + 2) \\ &= 8x + 4 + 9x + 6 \\ &= 17x + 10 \end{aligned}$$

$$\begin{aligned} &5(2a + 3b) + 4(3a - 2b) \\ &= 10a + 15b + 12a - 8b \\ &= 22a + 7b \end{aligned}$$

$$\begin{aligned} &10 + 2(2p - 4) + 3p \\ &= 10 + 4p - 8 + 3p \\ &= 2 + 7p \text{ (or } 7p + 2) \end{aligned}$$

3) Learn how to factorise an expression, for example: -

$$5a + 20b + 15c = 5(a + 4b + 3c)$$

Find a factor that is common to every term - this goes in front of the brackets. In the brackets is each term divided by the common factor.

$$28x - 35y = 7(4x - 5y)$$

$$16p + 24q + 8r = 8(2p + 3q + r)$$

Always use the largest possible common factor (8 in this example, not 4 or 2)

$$a^2 + 5ab + 7a = a(a + 5b + 7)$$

The common factor can be a letter.

$$12m^3 + 9m^2 + 6m = 3m(4m^2 + 3m + 2)$$

The common factor may include a number and a letter.