Expanding Two Brackets and Simplifying

When multiplying one bracket by another, it is important to remember to multiply each term in the first bracket by each term in the second bracket. If there are two terms in the first bracket and two terms in the second bracket, there will be 2 x 2 = 4 terms in your answer (before simplifying).

Example 1

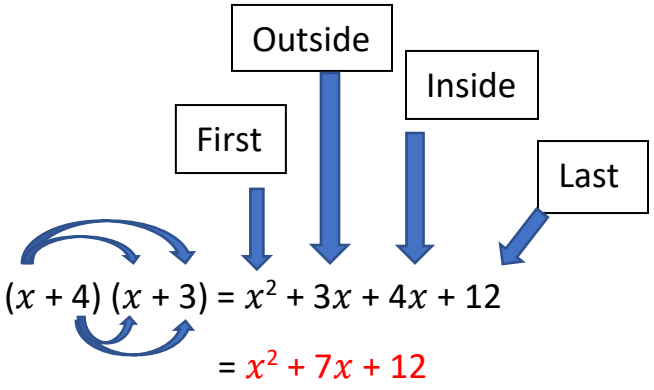
Expand and simplify the following expressions:

a) $(x + 4)(x + 3)$

b) $(x + 2)^2$

Solution 1

a) $(x + 4)(x + 3)$



To remember how to multiply out 2 brackets we can remember the word FOIL.

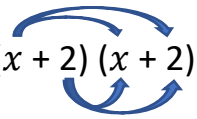
F – First – we multiply the first term in the brackets

O – Outside – we multiply the terms on the outside of the expression

I – Inside – we multiply the terms on the inside of the expression

L – Last – we multiply the last term in each bracket

b) $(x + 2)^2$ $= (x + 2)(x + 2)$



$= x^2 + 2x + 2x + 4$

$= x^2 + 4x + 4$

Remember: squaring a number multiplies it by itself.

Example 2

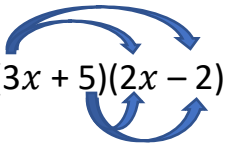
Expand and simplify the following expressions:

a) $(3x + 5)(2x - 2)$

b) $(4x - 2)^2$

Solution 2

a) $(3x + 5)(2x - 2)$

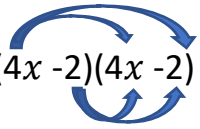


$= 6x^2 - 6x + 10x - 10$

$= 6x^2 + 4x - 10$

Be careful when it comes to brackets with negatives inside.
In this case we have:
$3x \times 2x = 6x^2$
$3x \times -2 = -6x$
$5 \times 2x = 10x$
$5 \times -2 = -10$ which we then combine for our answer.

b) $(4x - 2)^2$ $= (4x - 2)(4x - 2)$



$= 16x^2 - 8x - 8x + 4$

$= 16x^2 - 16x + 4$