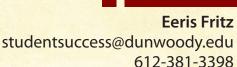


The Math Center



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Simplifying binomials

If we are asked to simplify the following binomials

(5 + 2)(3 + 4) this is simple if we follow **PERMDAS** to help us simplify.

$$(5+2)(3+4) = (7)(7) = 49$$
 using **PERMDAS**

However, there is a longer method used in algebra when we cannot simplify further in the parentheses. We will use the distribution method and do the multiplication first.

$$(5+2)(3+4)$$

- take the first term, 5, in the first binomial
 - multiply it through each term in the second binomial
- take the second term, 2, in the first binomial
 - · multiply it through each term in the second binomial.

$$(5 + 2) (3 + 4) = 5(3 + 4) + 2(3 + 4)$$

= 15 + 20 + 6 + 8
= 49 using the longer method, we still get the same answer

Let's look at why we need another method to help us simplify binomial expressions.

Simplify (x + 3)(x + 7); We can see that we cannot simplify further inside the parentheses, so we must use the longer method to allow us to multiply binomials.

Ex.
$$(x + 3) (x + 7) = x(x + 7) + 3(x + 7)$$

= $x^2 + 7x + 3x + 21$ now add like terms
= $x^2 + 10x + 21$ *notice how each an

*notice how each and every term is distributed (multiplied) through.

Simplify the following

Ex.
$$(a + 5) (a - 3) = a(a - 3) + 5(a - 3)$$

 $= a^2 - 3a + 5a - 15$ add like terms
 $= a^2 + 2a - 15$ the simplified form
Ex. $(x - 4)^2 = (x - 4)(x - 4)$
 $= x(x - 4) - 4(x - 4)$
 $= x^2 - 4x - 4x + 16$
 $= x^2 - 8x + 16$ simplified form

Remember: pay attention to the signs of the terms as you are multiplying. This is where mistakes can happen. Take your time and understand the logic. PERMDAS guides you.