

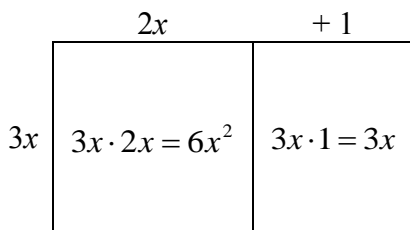


We have learned how to multiply a polynomial by a monomial term – we just distribute. In this lesson, we will learn how to multiply a binomial by another binomial or even a trinomial! To get started, we will introduce the idea of using a “box” to multiply.

Example 1: $3x(2x + 1) = ?$

(This is like finding the area of a rectangle with dimensions $3x$ and $2x + 1$.)

Here's what the “box method” looks like:



So $3x(2x + 1) = 6x^2 + 3x$



Here's how we multiplied without using a box:

$$3x(2x + 1) = 3x \cdot 2x + 3x \cdot 1$$

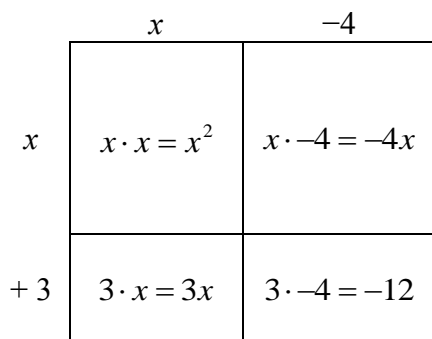
$$= 6x^2 + 3x$$

This is the **distributive property**. The $3x$ gets “distributed” to the $2x$ and the $+1$.

Example 2: $(x + 3)(x - 4) = ?$

This is like finding the area of a patio with dimensions $x + 3$ and $x - 4$.

Here's what the box method looks like:



So $(x + 3)(x - 4) = x^2 + -1x + -12$
(or $x^2 - x - 12$)

Now you try this problem using the box method:

$$(2x - 3)(3x + 4)$$

Use the box method shown above to multiply the following:

1. $3(2x + 4) =$

$$x^2 + -1x + -12$$

2. $x(3x - 5)$

3. $2x(x - 1) =$

4. $(x + 1)(3x + 2) =$

5. $(2x + 5)(3x - 4) =$

6. $(3x + 1)(x - 2) =$

7. $(2x + 5)(x - 3) =$

8. $(2x + 1)(2x - 1) =$

9. $(3x - 2)(3x - 2) =$

10. $(x + 1)^2 =$

11. $(3x+2)^2 =$

12. $(2x-5)^2 =$

13. $(x-1)(x^2-4x+2) =$

14. $(x+2)(x^2-3x+1) =$

15. $(x-3)(x^2+2x-1) =$

16. $(x-3)(2x^2-4x+5) =$

17. The length of a rectangle is $3x + 2$, the width is $2x - 7$. What is the area of the rectangle?

18. The length of a rectangle is $4x - 1$, the width is $x + 5$. What is the area of the rectangle?