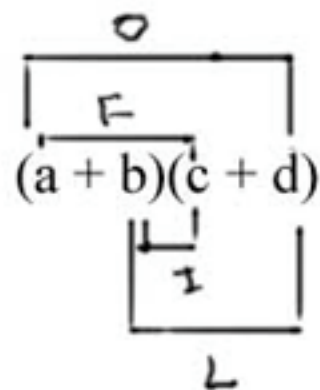


When multiplying two binomials, use the FOIL method. This means multiply the **F**irst terms of each binomial, the **O**uter terms of the binomials, the **I**nner terms, and the **L**ast terms of each binomial.



Ex 1) Multiply the two binomials using the FOIL method
 $(2x + 3)(4x - 2)$.

First

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

$$8x^2$$

Outside

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

$$8x^2 - 4x$$

Inside

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

$$8x^2 - 4x + 12x$$

Last

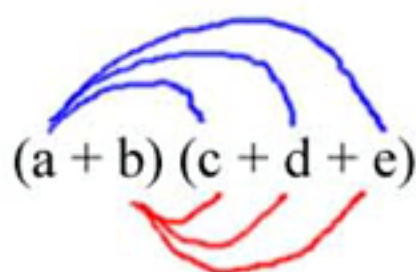
$$(2x+3)(4x-2)$$

$$8x^2 - 4x + 12x - 6$$

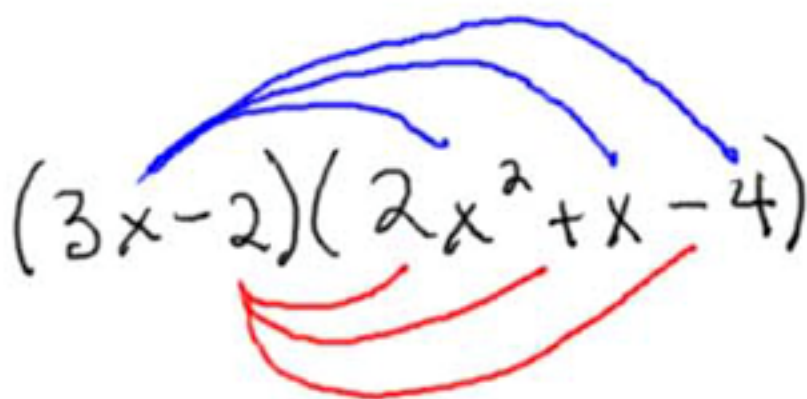
Simplify:

$$8x^2 + 8x - 6$$

When multiplying a binomial by a trinomial, think of it as using the distributive property twice. Multiply each term of the trinomial by the first term of the binomial, then multiply each term of the trinomial by the second term of the binomial.

$$(a + b)(c + d + e)$$


Ex 2) Multiply: $(3x - 2)(2x^2 + x - 4)$

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


$$\underline{6x^3} + \underline{3x^2} - \underline{12x} - \underline{4x^2} - \underline{2x} + \underline{8}$$

$$6x^3 - x^2 - 14x + 8$$

Let's look at some formulas for multiplying special binomials.

The **Perfect Square Trinomial** formulas:

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

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

Once,
Twice,
Three times
a Trinomial...

Mistake Alert!

$$(a + b)^2 \neq a^2 + b^2$$

$$(a - b)^2 \neq a^2 - b^2$$

Squaring a binomial always gives you a trinomial, hence the name of the formula, Perfect Square *Trinomial*.

Ex 3) Multiply: $(2x - 3)^2$

The formula says to do three things

1. Take the first term and square it,
2. Multiply the two terms and double it,
3. Take the last term and square it.

$$(2x - 3)^2$$
$$(2x)^2 + 2(2x)(-3) + (-3)^2$$
$$4x^2 - 12x + 9$$

The Difference of Two Perfect Squares Formula:

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

The binomials $(a + b)$ and $(a - b)$ are called conjugates.

Ex 4) Multiply: $(3x + 4)(3x - 4)$

The formula says to multiply the **F**irst terms and the **L**ast terms (the **O**utside and **I**nside terms cancel each other out).

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

$$9x^2 - 16$$

Clausen-ism Alert for multiplying conjugates:

The ex-CON drank from a JUG and ATE, so now he's FL (pronounced full).

When multiplying conjugates multiply the Firsts and the Lasts, the Alpha and Omega, the Beginning and the Ending Amen.

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