Factoring - The End

For Now...

In our last section, I showed you a trick. I usually don't like to do that as when a student learns 'tricks' they use it all the time.

All of the questions I gave last class were selected to work. In general, it will not work.

The first question we did yesterday was $x^2 + 3x + 2$ and we saw that $m = 1$ and $n = 2$. Easy.

What if we simply added a 2 in front of x^2?

$$2x^2 + 3x - 2$$

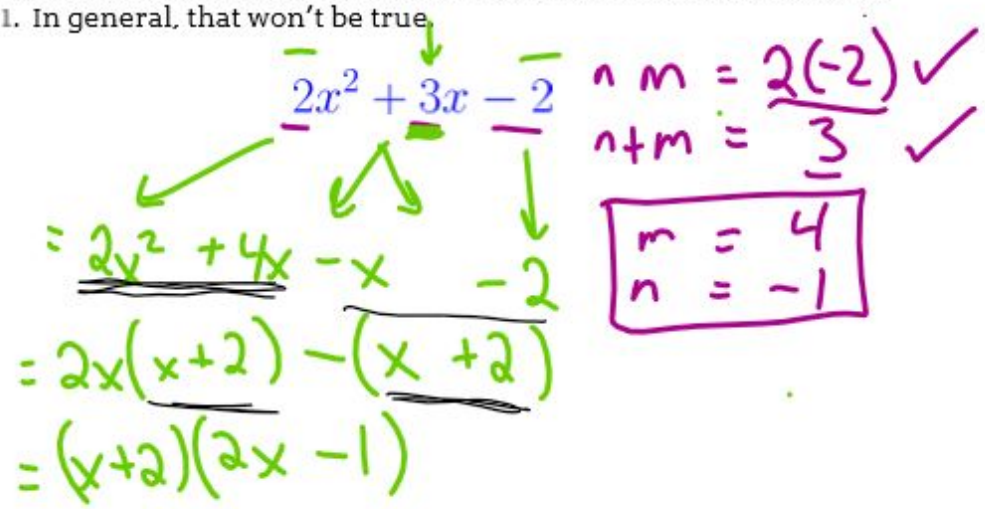
You see how yesterday's trick won't work?

Let's try to reverse engineer what is going on...

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

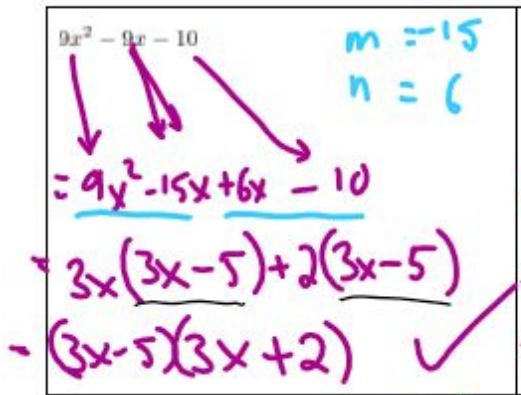
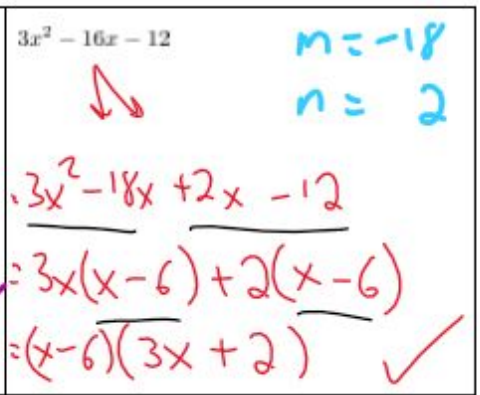
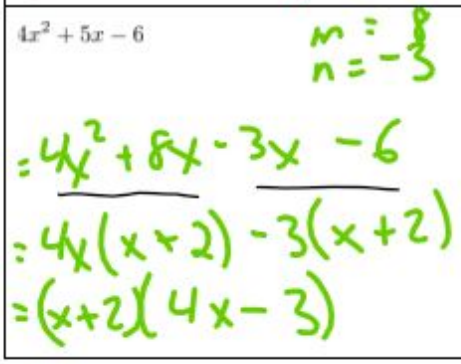
The 3 comes from $2 \times 2 - 1 = 3$.
In general, a quadratic of the form $ax^2 + bx + c$ will require you to find 2 numbers, m and n, that multiply to $a \times c$ and add to b.

This worked yesterday because I made sure that, for every question, $a = 1$. In general, that won't be true.



- Find 2 numbers, m and n, that multiply to $a \times c$ and add to b.
  - $ax^2 + bx + c$
- Since your numbers add to b. We can rewrite b as $mx + nx$.
- We know that we can factor by grouping as we chose m and n.
- After group factoring, you better see that your 2 brackets have the same thing...
  - ...or you done goofed.
- Factor out the brackets that are the same.
  - Celebrate.

Lets Try:

$9x^2 - 9x - 10$ 	$3x^2 - 16x - 12$ 
$4x^2 + 5x - 6$ 	$2x^2 + 11x + 12$

Some hard problems:

$(x+1)^2 - 8(x+1) + 16$	$8(x-3)^2 - 64(x-3) + 128$
$7a^2x - 6a^2 - 7x + 6$	$x^4 - x^2 - 12$
$x^{4n} - y^{4n}$	