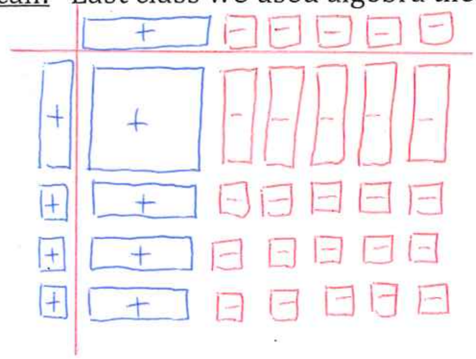
3.5 Polynomials of the Form $x^2 + bx + c$ (Part 2)

<u>Recall:</u> Last class we used algebra tiles to expand $(x+3)(x-5)$



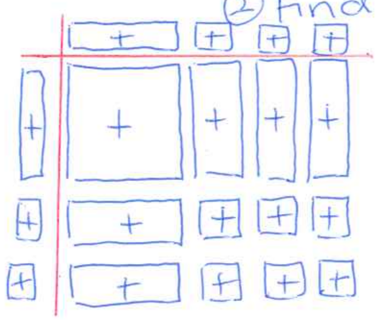
$x^2 - 2x - 15$

Today we will work in reverse. We will use algebra tiles to factor a trinomial.

<u>Example:</u> Use algebra tiles to factor each trinomial.

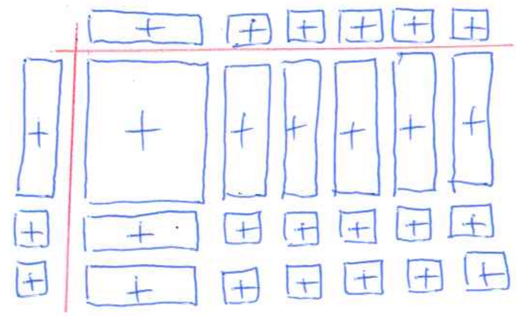
a) $x^2 + 5x + 6$

① make the rectangle
② Find side lengths



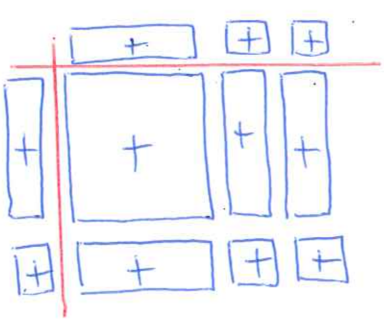
$(x+2)(x+3)$

b) $x^2 + 7x + 10$



$(x+2)(x+5)$

c) $x^2 + 3x + 2$



$(x+1)(x+2)$

d) $x^2 - 2x - 8$

Note: Algebra tiles get a little too confusing when we have negative numbers

How can we factor trinomials without algebra tiles? Look for patterns with the numbers.

Ex: $x^2 - 2x - 8 = (x-4)(x+2)$

product

Summarize your observations :

The two numbers give a product for the last digit and a sum to the coefficient of the middle term

sum

Example: Factor each trinomial without algebra tiles.

a) $x^2 - 3x - 24$

$\underline{5} \times \underline{-8} = -24$

$\underline{5} + \underline{-8} = -3$

$= (x+5)(x-8)$

b) $x^2 - 2x - 24$

$\underline{4} \times \underline{-6} = -24$

$\underline{4} + \underline{-6} = -2$

$= (x+4)(x-6)$

c) $10 - 11x + x^2$

Rearrange: $x^2 - 11x + 10$

$\underline{-1} \times \underline{-10} = 10$

$\underline{-1} + \underline{-10} = -11$

$(x-1)(x-10)$

d) $-5x^2 + 20x + 60$

$= -5(x^2 - 4x - 12)$

$= -5(x-6)(x+2)$