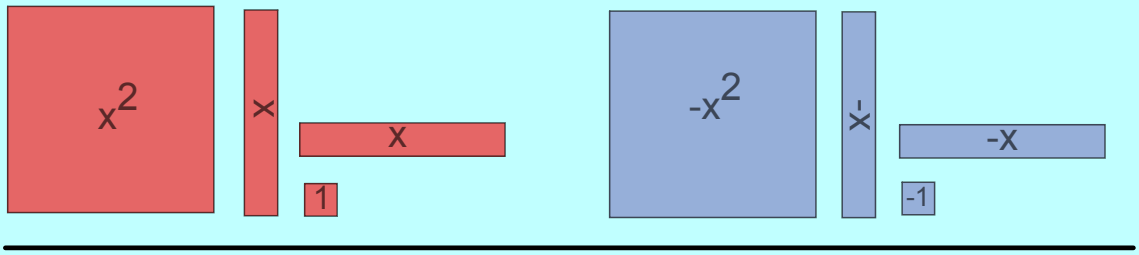
Factoring Simple Quadratic Trinomials ($x^2 + bx + c$)

March 24/2011

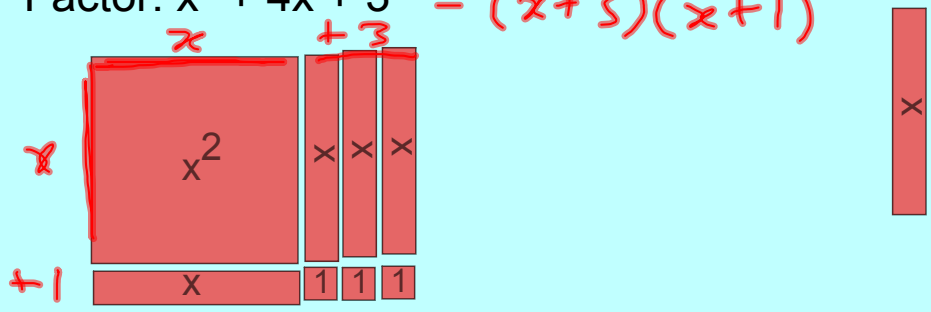
1. Using Alge-tiles

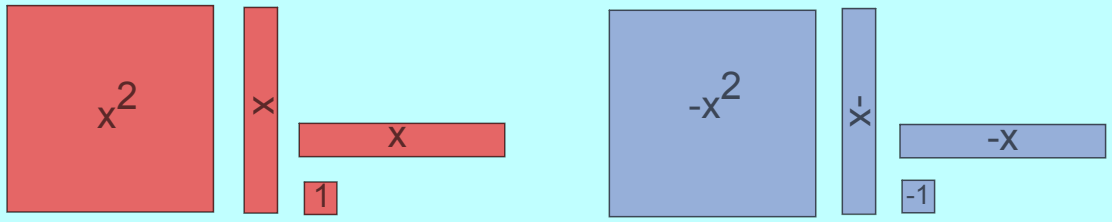
Model the expression as an area. The tiles must form a rectangle (or square).

The lengths of the sides are factors.

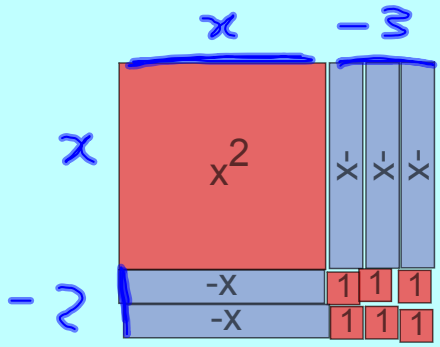


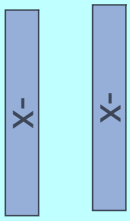
Factor: $x^2 + 4x + 3$ $= (x+3)(x+1)$

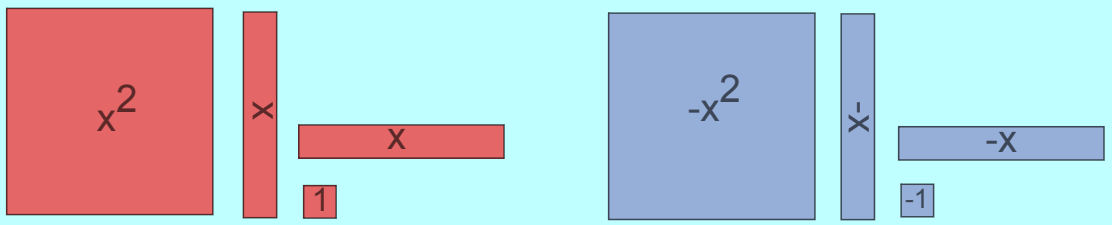




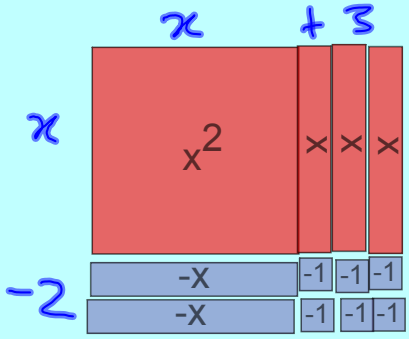
Factor: $x^2 - 5x + 6$ $= (x-3)(x-$

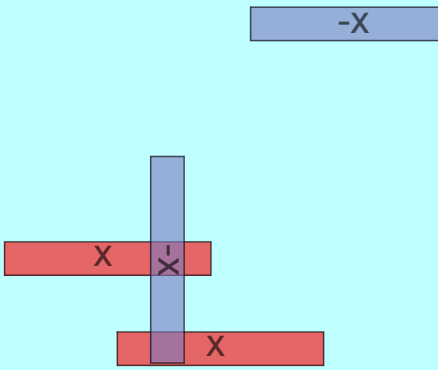






Factor: $x^2 + x - 6$ $= (x+3)(x-2)$

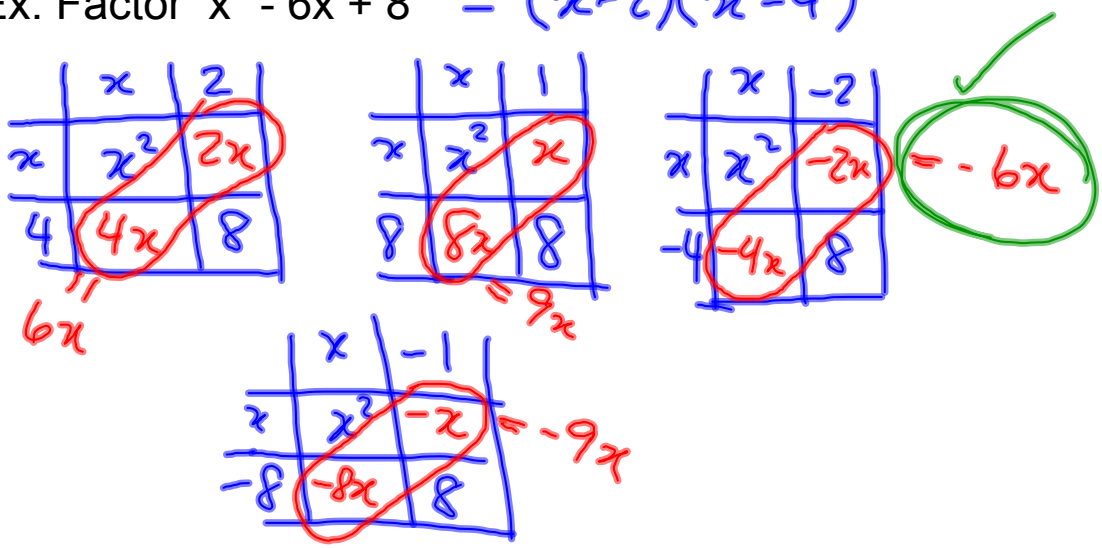




2. Using a Diagram

What are the possible dimensions of the constant value (bottom right corner)?

Ex. Factor $x^2 - 6x + 8$ $= (x-2)(x-4)$



3. Algebraically

Consider: $(x + 2)(x + 3) = x^2 + 5x + 6$

What relationship is there between the factors and the coefficients of the answer?

$2 + 3 = 5$ → middle term is the sum of factors

$2 \times 3 = 6$ → constant term is the product of the factors

In general, given

$(x + m)(x + n) = x^2 + bx + c$

then

$b = m + n$ and $c = m \times n$

To factor $x^2 + bx + c$:

1. Find two numbers that multiply to c, and
2. the same two numbers that add to b.

constant term ↓ c

↑ b middle term

Ex. Factor $x^2 - 8x + 12$

what multiplies to 12?

	add
3, 4	7 ✗
6, 2	8 ✗
1, 12	13 ✗
-3, -4	-7 ✗
-6, -2	-8 ✓
-1, -12	-13 ✗

$x^2 - 8x + 12$

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

Assigned Work:

p.211-213 #1, 2b, 3bc, 4, 7, 8,
#9(look for common factors first)
#12