

3.4A: Factoring Using Algebra Tiles

Trinomials of the form $ax^2 + bx + c$ can be factored using algebra tiles (alge tiles). To do this, the tiles modeling the trinomial are laid out. Next, with the x^2 tile in the upper left position the remaining tiles are arranged around it to form a rectangle.

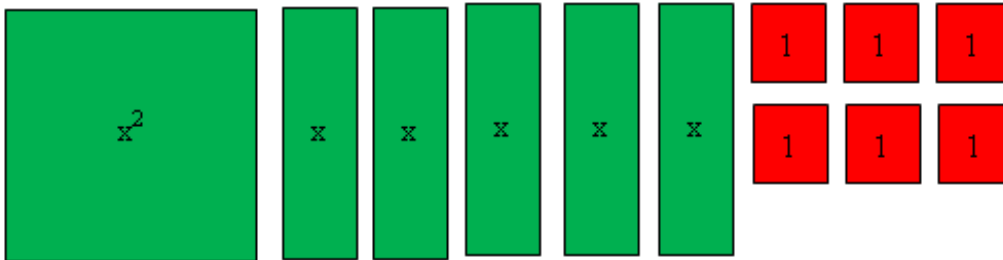
Example 1: Factor $x^2 + 5x + 6$

Step 1: Place the tiles that represent this in front of you.

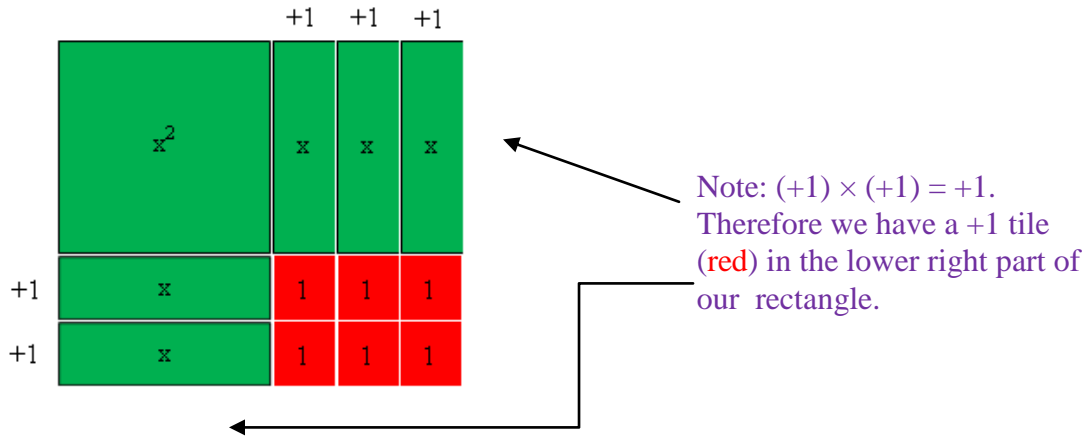
1 – x^2 tile

5 – x tiles

6 – 1 tiles



Step 2: Now, form the rectangular using the tiles.

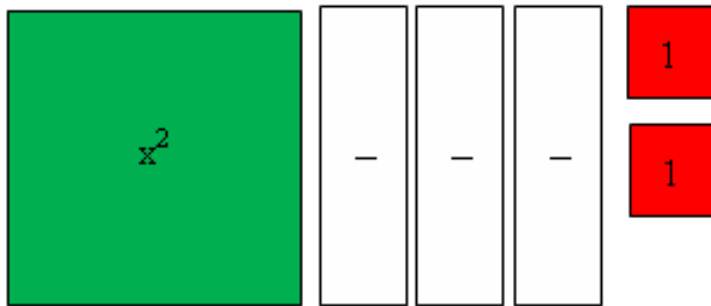


The width of the rectangle is $(x + 3)$

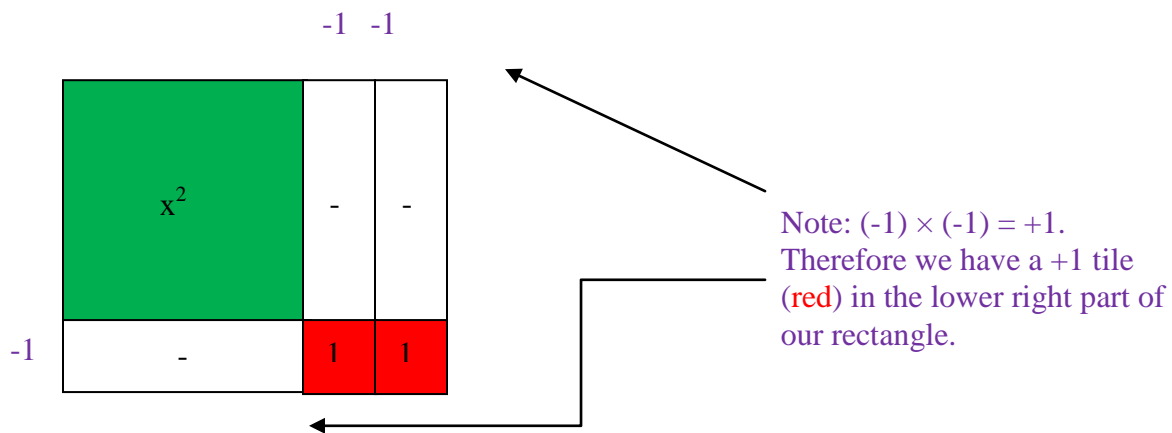
The length of the rectangle is $(x + 2)$

Therefore the factors of $x^2 + 5x + 6$ are $(x + 3)(x + 2)$ or $(x + 2)(x + 3)$

Example 2: Factor $x^2 - 3x + 2$



Making a rectangle ...



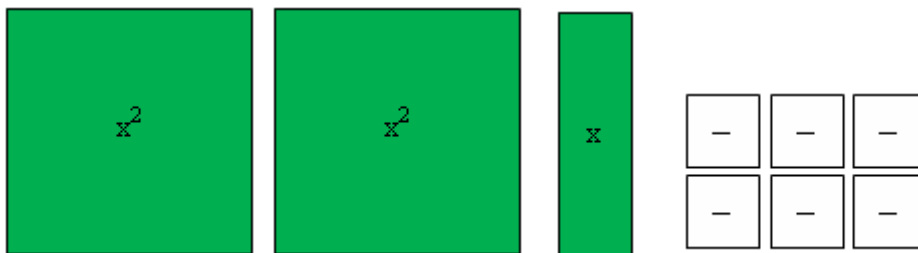
The width of the rectangle is $(x - 2)$

The length of the rectangle is $(x - 1)$

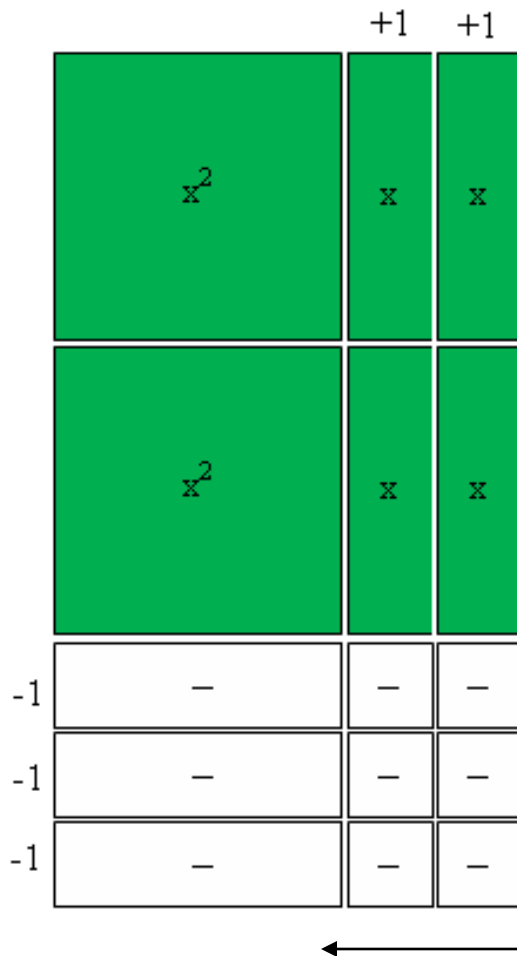
Therefore the factors of $x^2 - 3x + 2$ are $(x - 2)(x - 1)$ or $(x - 1)(x - 2)$

Example 3: Factor $2x^2 + x - 6$

Note sometimes x-tiles or 1-tiles must be added to form the rectangle. This is acceptable, but for each one that is added, its opposite must be placed in the rectangle as well as not to alter the original trinomial.



Now make a rectangle ...



Note: $(+1) \times (-1) = -1$.
Therefore we have a -1
tile(white) in the lower right
part of our rectangle.

The width of the rectangle is $(2x - 3)$

The length of the rectangle is $(x + 2)$

Therefore the factors of $2x^2 + x - 6$ are $(2x - 3)(x + 2)$ or $(x + 2)(2x - 3)$