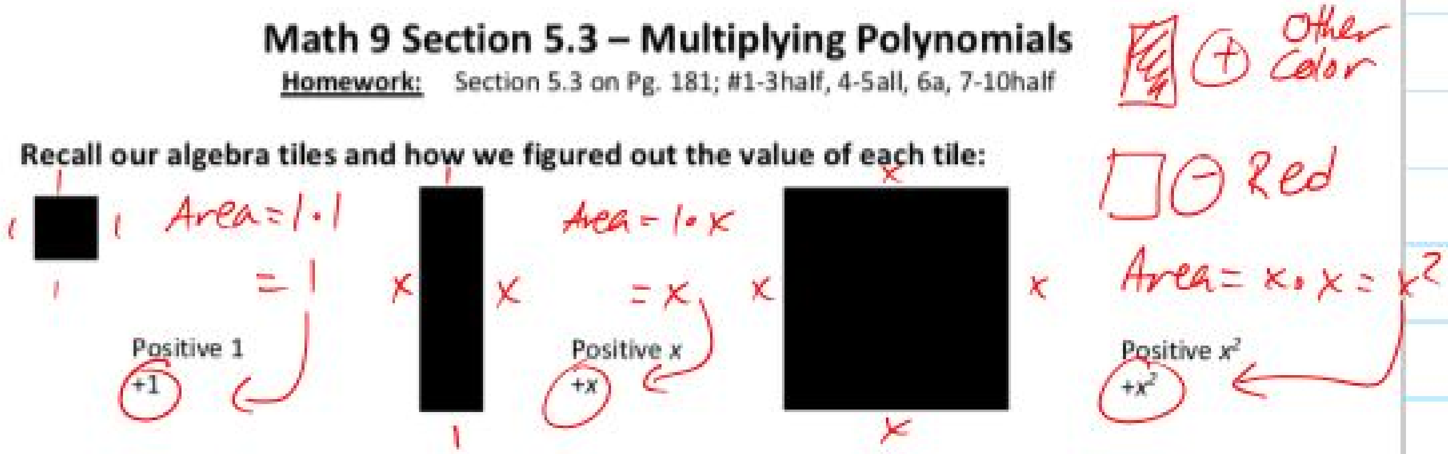
Math 9 Section 5.3 – Multiplying Polynomials

Homework: Section 5.3 on Pg. 181; #1-3half, 4-5all, 6a, 7-10half

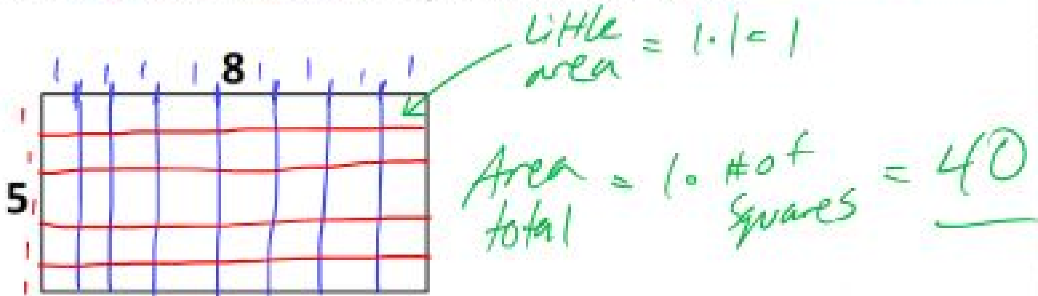
Recall our algebra tiles and how we figured out the value of each tile:



When we calculate the area of a rectangle, we multiply the sides together.

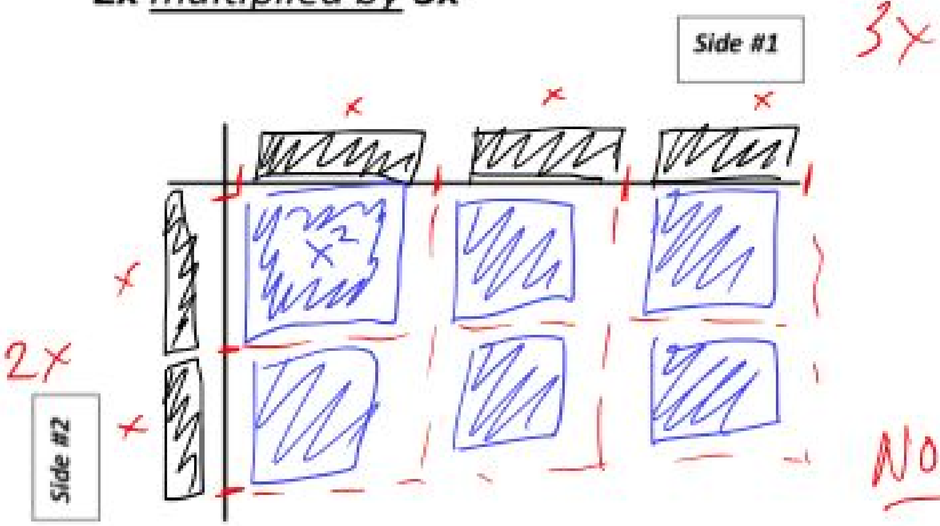
If we want to find the answer for two numbers multiplied together, that's the same as finding the area of a rectangle with the length equal to the first number and width equal to the second number.

Area = $5 \cdot 8 = 40$



This idea also works for polynomials, and we can use the algebra tiles to "measure out" the sides of the rectangle.

2x *multiplied by* 3x



Area = $2x \cdot 3x$

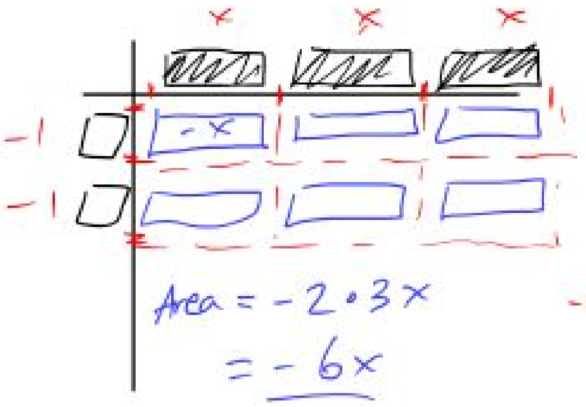
$= 6x^2$

Notice: $2 \cdot 3 = 6$

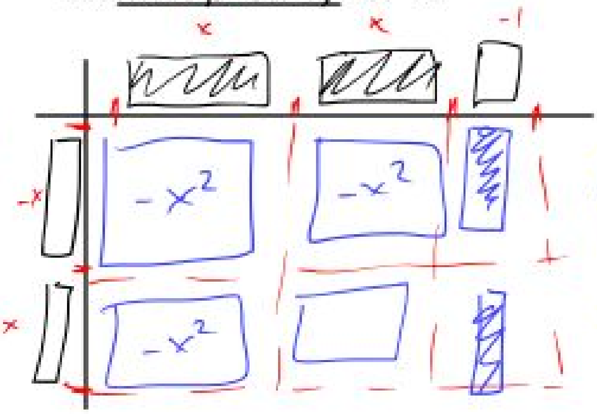
$x \cdot x = x^2$

$6 \cdot x^2 = 6x^2$

–2 *multiplied by* **3x**



–2x *multiplied by* **2x – 1**



Area = $(-2x) \cdot (2x-1)$

$= -4x^2 + 2x$

From our algebra tile pictures, we can see the pattern for multiplying polynomials:

1. Multiply the Coefficients (numbers) } multiply together
2. Multiply the variables (letters)
3. If there are 2 or more terms, we distribute the multiplication and add together (like subtracting)

$(-3x^2)(-7x)$ = $[(-3) \cdot (-7)] \cdot [x^2 \cdot x^1]$ $= 21x^3$ (same base: $2^2 \cdot 2^1 = 2^3$)

$(-4x^2y)(x^4y^7)$= $[(-4) \cdot (1)] \cdot [x^2y \cdot x^4y^7]$ $= -4x^6y^8$ (diff bases) (Can't combine)

$(-2x)(3x^2 - 5)$ = $(-2x) \cdot (3x^2) + (-2x)(-5)$

$3x^2 + (-5)$

$= -6x^3 + 10x$

$(3x + 2y)(xy)$ = $(3x)(xy) + (2y)(xy)$

$= 3x^2y + 2y^2x$ (not like terms)

5·8
8·5

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

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

$= -6x^4 + 3x^3 - 12x^2$